Construction Environmental Management Plan

URBNSURF (Developments) Sydney

URBNSURF (DEVELOPMENTS) SYDNEY Pty Ltd
LIPMAN PTY LTD

To be read in conjunction with
Lipman Project Management Plan

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Construction Environmental Management Plan

URBNSURF (Developments) Sydney

September 2021
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Document control

Approval

Title	URBNSURF Sydney Construction Environmental Management Plan
Approved on behalf of URBNSURF (Developments) Sydney Pty Ltd	Jonathan Howell
Signed	
Dated	
Approved on behalf of Lipman by	
Signed	
Dated	22/03/2022

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Distribution of controlled copies

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The document is uncontrolled when printed. One controlled hard copy of the CEMP and supporting documentation will be maintained by the Quality Manager or delegate at the Project office.

Copy number	Issued to	Version

List of emergency and key contacts

Position	Name	Phone
EPA pollution hotline		131 555
Fire and Rescue NSW		000 (for pollution incidents that present an immediate threat to human health or property) 1300 729 579 (for pollution incidents that do not present an immediate threat to human health or property)
The Ministry of Health		(02) 9391 9000
Nearest Hospital	Concord Hospital	(02) 9767 5000
SafeWork NSW		131 050
Parramatta Council		(02) 9806 5050
24 hour community information line		1800 316 543
Environmental Site Representative (ESR) Lipman	Cameron MacArthur	0438 624 253
Project Manager Lipman	John Knights	0417 232 123
Site Manager	Cameron Bowden	0409 165 665
URBNSURF (Developments) Sydney Representative	Jonathan Howell	0400 128 318
URBNSURF (Developments) Sydney Environmental Representative	TBC	TBC
SOPA		02 9714 7300
SOPOC (Sydney Olympic Park Operations Centre)		02 9714 7700

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Glossary/Abbreviations

Abbreviation	Expanded text
ASS	Acid Sulphate Soils
CEMP	Construction Environmental Management Plan
CEMS	Contractors Environmental Management System
Compliance audit	Verification of how implementation is proceeding with respect to a Construction Environmental Management Plan (CEMP) (which incorporates the relevant approval conditions).
DPIE	Department of Planning Industry and Environment
EEC	Endangered Ecological Community
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life now and in the future, can be increased (Council of Australian Governments, 1992)
EPA	NSW Environment Protection Authority
ESR	Environmental Site Representative
EMS	Environmental Management System
Environmental aspect	Defined by AS/NZS ISO 14001:2015 as an element of an organisation's activities, products or services that can interact with the environment.
Environmental impact	Defined by AS/NZS ISO 14001:2015 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental incident	An unexpected event that has, or has the potential to, cause harm to the environment and requires some action to minimise the impact or restore the environment.
EMM	Environmental Management Measure
Environmental objective	Defined by AS/NZS ISO 14001:2015 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.
Environmental policy	Statement by an organisation of its intention and principles for environmental performance.
Environmental target	Defined by AS/NZS ISO 14001:2015 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
ESR	Environmental Site Representative
EWMS	Environmental work method statement
Hold point	Is a verification point that prevents work from commencing prior to approval
Minister, the	Minister of the NSW Department of Planning Industry and Environment (or delegate)

Non-compliance	Failure to comply with the requirements of the Project approval or any applicable licence, permit or legal requirements.
Non-conformance	Failure to conform to the requirements of Project system documentation including this CEMP or supporting documentation.
NOW	NSW Office of Water
OEH	former Office of Environment and Heritage
PESCP	Progressive Erosion and Sediment Control Plan
PIRMP	Pollution Incident Response Management Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
Project, the	URBNSURF Sydney
Roads and Maritime	former Roads and Maritime Services
ROL	Road occupancy licence
SAP	Sensitive Area Plan
SEMP	Site Establishment Management Plan
URBNSURF (Developments) Sydney Pty Ltd	Client

1 Introduction

1.1 Background

Historically Sydney Olympic Park was subject to uncontrolled tipping of power station ash, demolition waste and other waste from the late 1950s until the late 1980s. Containment works were undertaken in the 1990s and, although the site has been subject to filling, the site is not located within one of these containment cells. Asbestos was identified above the adopted criteria (of no asbestos detected) in soil samples obtained from locations and D7 at depths between 1 mBGL and 3 mBGL. Asbestos identified comprised small fragments of bonded asbestos sheeting, friable asbestos fibreboard and fibre bundles. The confluence of asbestos detections and presence of foreign material in the soil indicate that during historical filling of the site some imported or reused material containing a variety of foreign material including asbestos waste was placed in some areas of the site, principally in the northern corner but in other localised areas as well. The asbestos-impacted material represents a potential risk to construction workers during the proposed redevelopment work at the site, as well as a potential risk to nearby site users or passers-by in the event of dust generation during excavation or construction work.

- *Source – WSP Environmental Site Investigation, Aug 2016*

1.1.1 Physical Setting

1.1.1.1 Topography and Drainage

Surface elevation across the site ranges from approximately 9 meters Australian Height Datum (mAHD) in the south to 5 mAHD in the north, with an approximate 3% grade. Surface water is expected to drain towards the stormwater drainage channels located in the centre and north-west of the site. Surface water and groundwater is anticipated to flow east towards Haslams Creek approximately 150 m east of the site and the Parramatta River 750 m east of the site, which ultimately discharges into Wentworth and Homebush Bay.

1.1.1.2 Geology and Soils

The Department Industry, Resources and Energy, 1983, 1:100,000 Geological Series Sheet 9130 (Edition 1) indicates that the site comprises of man-made fill including dredged estuarine sand, demolition rubble, industrial and household waste. This material is underlain by silty to peaty quartz sand, silt and clay with ferruginous and humic cementation and common shell layers.

The geology encountered during the DSI comprised mixed fill material from beneath surface asphalt/concrete to the maximum depth of the investigation at 3 metres below ground level (mBGL). The most predominant fill material units observed were a brown gravelly sand and a brown gravelly clay. Fill material comprising of anthropogenic materials was also observed predominantly in the north-east portion of the site.

1.1.1.3 Hydrology and Hydrogeology

The nearby Newington and Bicentennial Park Wetlands (located approximately 30 m north of the site) are nationally significant, although based on the NSW Planning Portal the site is not considered to include wetlands. The site is surrounded by constructed drainage basins (Narawang Wetland to the north) and estuaries (Haslams Creek to the south) connecting to the tide-dominated Parramatta River (approximately 750 m east). Given the close proximity to Haslams Creek, groundwater is considered to flow east towards the creek.

1.2 Purpose of this CEMP

This Construction Environmental Management Plan (CEMP) and sub plans have been prepared in accordance with ISO 14,001 and describe how Lipman and covers all personnel and subcontractors working on the site. The CEMP shall be monitored for regular compliance to any applicable State or Territory legislation regarding the works.

The CEMP is to provide a framework for the management of works in order to reduce adverse impacts on the environment and in particular;

- to ensure that works are carried out in accordance with appropriate environmental statutory requirements,
- to ensure that works are carried out in such a way to minimize environmental risk; • ensure that all personnel engaged in works comply with the CEMP;
- to ensure that no changes are made to the CEMP without the written permission of Lipman Project Manager / URBNSURF (Developments) Sydney Pty Ltd or their representative; and
- to respond to changes in environmental conditions during the works through review, monitoring and control programs with the Project Manager, or their representative, to ensure that corrective actions are completed in a timely manner

Additionally, it outlines how Lipman will minimise the environmental risks, and achieve environmental outcomes on the project by providing a structured approach to ensure appropriate mitigation measures and controls are implemented.

The CEMP has been prepared in accordance with the following Acts, Codes and documents;

- AS/NZS ISO 14001: 2015 Environmental Management Systems.
- NSW Government Environmental Management Systems Guidelines Edition 2, (Sept 2009)
- Protection of the Environment Operations Act 1997 (POEO Act)
- Contaminated Land Management Act 1997; Amended 2008
- Environmental Planning and Assessment Act, 1097 (State Environmental Planning Policy N 55 – Remediation of Land)
- Environmentally Hazardous Chemicals Act, 1985
- Work Health and Safety Act 2011
- "Managing Urban Storm water" – Soils and Construction 4th edition - (Landcom) March 2004.
- NSW EPA (1999 as revised 2004) Environmental Guidelines for the assessment and management of liquid and non-liquid wastes.
- ANZECC (2000) Australian and New Zealand Guidelines for Fresh & Marine Water Quality.
- Pollution Control Manual for Urban Storm water.

This CEMP will:

- Fulfil the Client's environmental requirements as defined by the contract and the Project;
- Ensure compliance with Lipman Policies and Procedures;
- Ensure compliance with relevant environmental legislation;
- Ensure environmental risks associated with Lipman activities are properly managed;
- Assist in the prevention of unauthorised environmental harm;
- Comply with all relevant environmental legislation;
- Identify potential adverse impacts (threats) and potential beneficial effects (opportunities) associated with project objectives and assess them on a regular basis;

- Minimise negative impacts on the community that relate to the Project's environmental impacts; and
- Identify and implement valid opportunities to reduce the environmental impact of the Project that are beyond contractual and compliance requirements.

This CEMP is the overarching document in the environmental management system for the URBNSURF (Developments) Sydney Project that includes a number of management documents. It is applicable to all staff and sub-contractors associated with the construction of the Project. The Environmental Management System is further outlined in Section 1.4 of this document.

1.3 Project description

URBNSURF Sydney is an integrated, year-round, aquatic sports, recreation, events and tourism-based facility.

URBNSURF Sydney will feature, and be designed around, a Wavegarden™ Cove surfing lagoon. A Wavegarden™ Cove surfing lagoon is a large, man-made water body in which waves are generated by proprietary mechanisms located along the central axis of the lagoon. High quality, surfing waves of up to 1.8 metres in height and over 150 metres in length are created in the lagoon. The lagoon is divided into two separate zones, which cater to guests of differing capabilities. Ancillary amenities and facilities will also be developed to support the venue's function and appeal.

Key features of the Project include:

In addition to offering a range of aquatic and surfing related options to guests, URBNSURF Sydney will also provide the following activities and amenities:

- Surf sessions and Surf lessons (for all levels of ability);
- Surf competitions;
- Personal and group fitness programs;
- Hiring and demonstration services;
- Private and corporate functions;
- Art/music/film festival events; and
- Children's playgrounds.

Figure 1-1 Proposed Recreational Facilities

1.3.1 Scope of Works

The Scope of Works include but are not limited to the engineering, temporary works design, labour, material, plant, equipment, load-in, re-configuration and supervision required for construction and completion of the earthworks elements identified on the IFC documentation. During the construction period the site will undergo a significant remediation exercise in order to suitably prepare the site for ongoing public use. This remediation exercise will be undertaken in accordance with the approved WSP planning RAP and the PRM Supplementary RAP.
The scope for the civil and services works that will be undertaken by Lipman is summarised but are not limited to the following:

1. Mobilisation & Site Establishment.
2. Site Strip and Preparation.
3. Diversions, Decommissioning and Re-Commissioning of Existing Site Services.
4. External Services Lead Ins and Main Inground Services Runs.
5. Bulk Earthworks.

6. Ground Improvements – Rigid Inclusions (D&C) Separable Portion.
7. Retaining Walls.
8. Remediation of the site to a suitable standard for the proposed redevelopment in accordance to WSP planning RAP and PRM supplementary RAP.
9. Construction of lagoon structure
10. Construction of buildings and amenities

The Scope of Works are to be completed all in accordance with URBNSURF's Project Requirements, project specific remediation plans, Australian Standards, all Legislative Requirements, as well as the terms and conditions of the final Contract.

1.4 Environmental Management System overview

Lipman is committed to providing services that conform to contractual, regulatory and Company requirements. To achieve this, the Project shall plan, implement and control construction activities in accordance with Lipman's ISO 14001:2015 accredited Environmental Management System (EMS). The EMS is fully integrated into the Company's Business Management System (BMS) and is available to employees via the Intranet and provides documented policies, procedures and instruments identified throughout this CEMP and associated documentation.

Copies of the EMS shall be made available to Workers, the supply chain, Client and other interested parties where relevant / upon request.

2 Environmental Management Plan

2.1 Preparation and availability of the CEMP

The CEMP for this project has been prepared in accordance with the *Guideline for the Preparation of Environmental Management Plans* (DIPNR), the requirements of Development consent (20th December 2017) and it incorporates all requirements of the Environmental assessment Report (December 2017), and all relevant licences, permits and approvals for the project.

The Lipman -Environmental Policy demonstrates Lipman's commitment to the environment and is included in Appendix A5 of this CEMP. The environmental policy will be signposted at the site offices and communicated to staff and other interested parties via inductions and ongoing awareness programs. The policy contains a commitment to the principles of Ecologically Sustainable Development as detailed in the *Protection of the Environment Administration Action 1991* (NSW).

This initial Construction Environmental Management Plan (CEMP) shall be approved by the Project Manager and HSEQ Superintendent prior to submission and acceptance by the Client. The CEMP will be submitted to URBNSURF (Developments) Sydney Pty Ltd prior to commencement of works.

This CEMP shall be reviewed at least bi-annually, or earlier where major changes are required to address potential or actual plan deficiencies raised through:

- An environmental or systems audit
- A major incident resulting in changes to method or controls
- Regulatory changes
- Contractual / scope change
- Management reviews

Minor revisions can be approved by the Project Manager. Major changes will require review and acceptance by the HSEQ Manager (or delegate) and the Client.

All revisions must be communicated to Workers (via Induction, toolbox talk, internal training etc.).

2.2 Planning

2.2.1 Environmental Risk Assessment Workshop

An Environmental Risk Assessment will be undertaken in conjunction with client representatives to help identify key environmental risks specific to the project. The following activities have been identified for reviewed:

- Clearing and Grubbing Earthworks
- Excavation of Soils or Hazardous Materials
- Offsite Disposal of Waste and Contaminated Materials
- Excavation disturbing Asbestos Material if found
- General construction activities

Each activity will be assessed to identify the relevant steps in the activity and the associated environmental hazards, initial risk levels, mitigation measures and to avoid, manage and/or minimise the risks and residual risks.

Appendix A3 contains a list of environmental aspects and impacts including those to be discussed in the risk assessment workshop, and the associated levels of risk that have been assigned to those activities.

Where residual risk was assessed as high, an Environmental Work Method Statement will be developed for that activity.

2.2.2 Regulatory requirements and compliance

Legislation

A register of legal and other requirements for the Project is contained in Appendix A1. This register will be reviewed at regular intervals, such as during management reviews, and updated with any applicable changes. Any changes made to the legal requirements register will be communicated to the wider project team, including subcontractors where necessary through toolbox talks, specific training and other methods detailed in Section 2.5 of this CEMP.

Approvals, permits and licences

Any approvals or licencing relevant to this CEMP will be managed by URBNSURF (Developments) Sydney Pty Ltd.

Monitoring records will be maintained by Lipman to monitor control performance. These will include daily inspection of site controls and continued communication between Lipman supervisor and URBNSURF (Developments) Sydney Pty Ltd site representative to ensure prompt response to changing conditions associated with weather and climatic conditions and wind direction changes that may affect effectiveness of controls in place from site.

Compliance tracking

The safeguards relevant to this CEMP are provided in Appendix A2 and a reference to where each requirement is addressed by this CEMP or other Project documentation.

2.2.3 Environmental objectives and targets

As a means of assessing environmental performance during construction of the Project, environmental objectives and targets have been established. The objectives and targets are consistent with the Project environmental policy and will assist in monitoring whether the commitments of the policy are being met.

The performance of the Project against the objectives and targets will be documented in the Project construction compliance reports and at least on an annual basis as part of the management review.

Environmental objectives and targets for the Project are incorporated into relevant environmental management sub plans and a summary is provided in Table 2-1 below.

Table 2-1 Environmental objectives and targets

Objective	Target	Measurement tool
Construction of the Project in accordance with environmental approvals.	Full compliance with statutory approvals.	Audits, construction compliance reporting, management view.
Compliance with all legal requirements.	No regulatory infringements (PINs or prosecutions).	No formal regulatory warning Audits, construction compliance reporting, management view.
Minimise environmental Impact	Where the Project has influence, adopt a lifecycle perspective during procurement of raw materials, production, transportation, use, maintenance, recycling and disposal	Nil environmental incidents Nil complaints

Objective	Target	Measurement tool
Minimise air quality impact	Compliance with safeguards	Nil dust complaints
Minimise noise nuisance	Compliance with safeguards	Nil noise complaints
Reduce waste	Minimise volume of material to landfill Appropriate disposal of regulated waste	Monitor waste generated per tonne aggregate produced
Minimise impact to ground and surface water	Capture and store stormwater run-off on site for re-use/ treatment Implement effective erosion and sediment controls Compliance with ESCP.	Nil water quality issues Nil soil and water pollution events
Minimise use of resources (energy, water)	Reduce electricity consumption Minimise water consumption Reduce energy consumption	Achieve target measures
Increase environmental awareness	Changed practices and environmental impacts Educate through ongoing awareness (e.g. pre-starts, toolbox talks, inductions)	Achieve target measures
Ensure compliance to regulatory requirements	Compliance with Review of Environmental Factors (REF) safeguards and regulatory requirements. Action non-conformances	No formal regulatory warning Audits, construction compliance reporting, management view.
Minimise impacts to flora and fauna	Compliance with Review of Environmental Factors (REF) safeguards	Nil flora and fauna issues No unauthorised clearing Nil injury to fauna
Prevent introduction and spread of weeds and pests	Complete inspections of vehicles, plant and equipment as per CEMP Monitor pest fauna where identified Eradicate identified / declared weeds on site	Achieve target measures
Prevent the release of hazardous substances	Compliance with safeguards and CEMP No hazardous waste spillage or leaks Nil contamination of water quality or soil due to hazardous materials Implement unexpected finds procedure (Appendix C2 (o))	Achieve target measures

Objective	Target	Measurement tool
Implement a rigorous and comprehensive EMS that meets the requirements of AS/NZS ISO 14001.	Address non-conformances and corrective actions within specific timeframes.	Audits, management reviews.
Continuously improve environmental performance.	Develop and maintain a program of ongoing environmental training. Capture lessons learnt from environmental incidents to minimise repeat issues.	Construction compliance report, management review.
Achieve site remediation criteria	Implement RAP and secondary RAP strategy and recommendations	Complete Validation of the remediation strategy to ensure compliance to the RAP.

2.2.4 Environmental Work Method Statement and Sensitive Area Plans

The project sites are located in an urban environment that has been historically cleared, filled and levelled. However, within this disturbed environmental setting, some remnant sensitive areas remain.

EWMS will be prepared for proposed works that are near these mapped sensitive areas, for high-risk activities, EWMS will incorporate relevant mitigation measures and controls, including those from relevant management sub plans. They also identify key procedures to be used concurrently with the EWMS. EWMS are specifically designed to communicate requirements, actions, processes and controls to construction personnel using plans, diagrams and simply written instructions.

EWMS will be prepared progressively prior to the commencement of relevant construction activities, and throughout construction in consultation with relevant members from the Project team.

EWMS for activities identified as having high environmental risk will undergo a period of consultation with stakeholders and authorities prior to approval.

As a minimum, EWMS will be prepared for the following activities:

- All dewatering activities
- Stockpiling
- Work in Environmentally Sensitive areas, including dewatering of the dam in the area is to be constructed
- Work in Potentially Contaminated areas

The EWMS will include at least the following elements:

- Description of the work activity, including any plant and equipment to be used
- Outline of the sequence of tasks for the activity, including interfaces with other construction activities
- Identification of any environmental and/or socially sensitive areas, sites or places
- Identification of potential environmental risks/impacts due to the work activity
- Mitigation measures to reduce the identified environmental risk, including assigned responsibilities to site management personnel
- Process for assessing the performance of the implemented mitigation measures.

EWMSs will be developed and signed off by environment and management representatives prior to undertaking the associated works. The EWMS submitted to the client for review and acceptance.

Used together, EWMSs and this CEMP, in addition to the management plans, environmental procedures and forms, will document the required environmental management actions, controls and measures to be implemented as part of the Project works, to minimise potential environmental impacts.

All construction personnel and sub-contractors undertaking a task governed by an EWMS would participate in training on the EWMS as outlined in section 2.5 of this CEMP and will acknowledge that they have read and understood their obligations by signing an attendance record prior to commencing work.

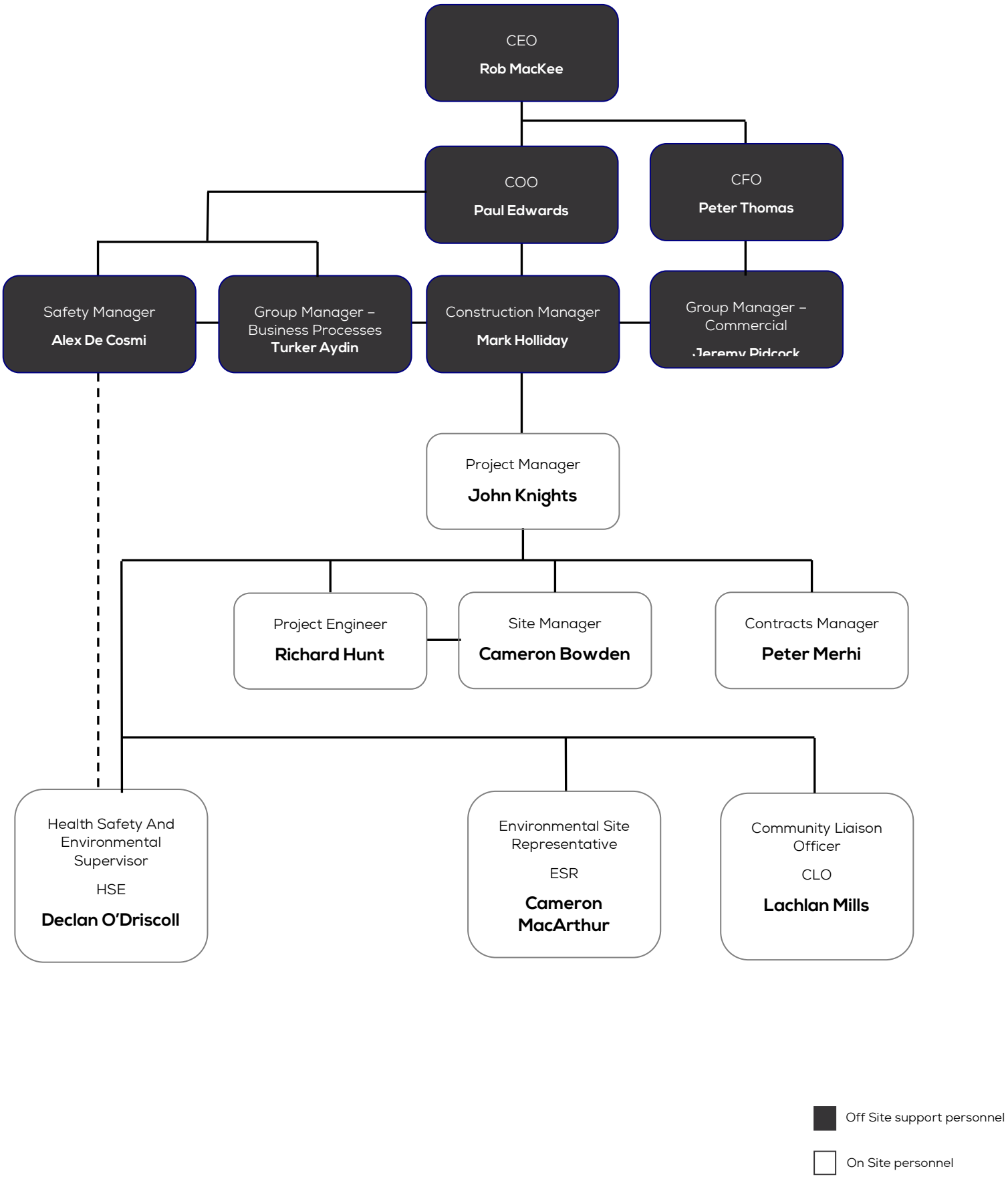
As outlined in section 2.9 and 2.11 of this CEMP, regular monitoring, inspections and auditing of compliance with the EWMS will be undertaken by Project management and environmental personnel. This will verify that all controls are being implemented, non-conformances are recorded, and corrective actions are undertaken, as required.

A register of EWMS will be maintained in the Document Register.

2.3 Resources, responsibilities and authority

The key environmental management roles and responsibilities for the Project are described below. The structure of these roles is shown in **Error! Reference source not found.**.

Figure 2.1: Project Organisation Chart



2.3.1 Roles and responsibilities

Contractor Project Manager (PM) – (John Knights)

The environmental responsibilities of the Project Manager include (but are not limited to) the following:

- Initiate, review and formally submit this Plan and associated deliverables to the Principal
- Regularly review progress and relevant deliverables
- Ensure all works comply with relevant regulatory and Project requirements
- Ensure the requirements of this CEMP are fully implemented, and in particular, that environmental requirements are not secondary to other construction requirements
- Endorse and support the Project environmental policy attached at Appendix A5
- Liaise with Client and government authorities as required
- Participate and provide guidance in the regular review of this CEMP and supporting documentation
- Provide adequate resources (personnel, financial and technological) to ensure effective development, implementation and maintenance of this CEMP
- Ensure that all personnel receive appropriate induction training, including details of the environmental and community requirements
- Ensure that complaints are investigated to ensure effective resolution
- Stop work immediately if an unacceptable impact on the environment is likely to occur.

Project Engineer (PE) – (Richard Hunt)

The environmental responsibilities of the Project Engineers include (but are not limited to) the following:

- Provide input into the preparation of environmental planning documents as required
- Ensure that instructions are issued and adequate information provided to employees that relate to environmental risks on-site
- Ensure that the works are carried out in accordance with the requirements of the CEMP and supporting documentation, including the implementation of all environmental controls
- Identify any environmental risks
- Identify resource needs for implementation of CEMP requirements and related documents.
- Ensure that complaints are investigated to ensure effective resolution
- Take action in the event of an emergency and allocate the required resources to minimise the environmental impact
- Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to the Supervisor and the ESR and/or EMR.

Site Manager (S) – (Cameron Bowden)

The environmental responsibilities of the supervisor include (but are not limited to) the following:

- Communicate with all personnel and sub-contractors regarding compliance with the CEMP and site-specific environmental issues
- Ensure all site workers attend an environmental induction prior to the commencement of works
- Co-ordinate the implementation of the CEMP
- Co-ordinate the implementation and maintenance of pollution control measures
- Identify resources required for implementation of the CEMP

- Support the ESR in achieving the project environmental objectives, including on ground implementation of the EWMS and ESCP.
- Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to the construction ESR
- Co-ordinate action in emergency situations and allocate required resources
- Stop activities where there is an actual or immediate risk of harm to the environment and advise the Construction Manager and ESR and/or EMR.

Environmental Site Representative (ESR) – (Cameron MacArthur)

The environmental responsibilities of the ESR include, but are not limited to, the following:

- Liaise with the PM to ensure the relevant ESCP is developed and approved;
- Ensure necessary environmental permits and approvals are identified and provided prior to site possession;
- Consult with the PE and SS to ensure the ESCP is implemented;
- Regularly inspect the project sites and associated facilities to ensure environmental controls are implemented, maintained and remain compliant;
- Advise on environmental matters;
- Liaise with the Principal and with all relevant authorities on environmental matters;
- Maintain a register of all environmental management documents for the Contract;
- Ensure that the CEMP is established, implemented and maintained including all Sub-Plans, procedures and supplementary EWMS, and upgrades to these documents are undertaken, as needed, to remain current with the progress of the Works;
- Overall responsibility for the establishment, management, monitoring and maintenance of erosion and sediment controls within the Site;
- Carry out regular inspections and auditing of the works to ensure that environmental safeguards are being followed;
- Identify where the implemented environmental measures are not meeting the targets set, and identify areas where improvement can be achieved;
- Prepare monthly reports outlining the works that have been undertaken and the achievements that have been met, as well as identifying those areas where improvements were made;
- Facilitate environmental induction and toolbox talks for all site personnel;
- Specific authority to stop work on any activity where the ER deems it necessary to prevent environmental harm, incidents and/or nonconformities;
- Notify relevant parties of any environmental incidents.

Health, Safety and Environment (HSE) Advisor (Declan O'Driscoll)

The environmental responsibilities of the HSE Advisor include, but are not limited to, the following:

- Communicate requirements for onboarding of plant and equipment;
- Liaise with the Lipman HR Department and PM to ensure a site-specific induction of personnel and workers has been developed specific to the project;
- Ensure emergency equipment is identified and installed;
- Establish the emergency response team;
- Ensure visitor inductions are developed and provided by the nominated project team member;

- Monitor site compound, in consultation with project personnel, to ensure health and safety requirements remain compliant in accordance with the Project Health and Safety Management Plan (HSMP) and Emergency Response Plan (ERP); and
- Comply with this CEMP.

Community Liaison Officer (CLO) (Lachlan Mills)

The environmental responsibilities of the Communications Liaison Officer include, but are not limited to, the following:

- Liaise with relevant stakeholders to ensure relationships are established and requirements for land access and possession are in accordance with Bayside Council requirements
- Comply with this CEMP and develop the Communications Plan
- Ensure that all community consultation activities are carried out
- Report any environmental issues to the ESR raised by stakeholders or members of the community
- Communicate general Project progress, performance and issues to stakeholders including the community
- Maintain the Lipman Compliant Register.

Wider project team (including sub-contractors)

The environmental responsibilities of the wider project team (including sub – contractors) include (but are not limited to) the following:

- Comply with the relevant requirements of the CEMP, or other environmental management guidance, as instructed by a member of the Project's management
- Participate in the mandatory Project/site induction program
- Report any environmental incidents to the Supervisor immediately or as soon as practicable if reasonable steps can be adopted to control the incident
- Undertake remedial action as required to ensure environmental controls are maintained in good working order
- Stop activities where there is an actual or immediate risk of harm to the environment and advise the Project Manager, Construction Manager, Superintendent or ESR.

2.4 Selection and management of subcontractors

The construction ESR, or delegate, will participate in the tender assessment and selection process where it is deemed necessary due to associated environmental risks. All sub-contractors will be required to complete a sub-contractor questionnaire or similar.

All sub-contractors are required to work in accordance with the approved CEMP, CEMP sub plans and associated documentation.

All sub-contractors are required to attend Project and/or site inductions where the requirements and obligations of the CEMP are communicated. A record of all sub-contractors inducted will be maintained as part of the Project induction and training register and held by the Lipman Project Manager on site.

A standard monitoring form will be developed that will be used to assess:

- The sub-contractor's general work practices
- The effectiveness of the sub-contractor's environmental protection measures
- The sub-contractor's compliance with the requirements of this CEMP
- The maintenance of environmental measures.

All environmental documentation submitted by contractors will be subject to review and approval by Lipman staff to ensure compliance with contract requirements before works may begin.

Environmental requirements and responsibilities are to be specified to sub-contractors in the contract documentation. As part of the selection process, consideration will also to be given to their past environmental performance.

2.5 Competence, training and awareness

To ensure that this CEMP is effectively implemented, each level of management is responsible for ensuring that all personnel reporting to them are aware of the requirements of this CEMP. The construction ESR will coordinate the environmental training in conjunction with other training and development activities (e.g. safety).

2.5.1 Environmental induction

All personnel (including sub-contractors) would attend a compulsory site-specific induction that includes an environmental component prior to commencement on-site. This is done to ensure all personnel involved in the Project are aware of the requirements of the CEMP and associated documentation and to ensure the implementation of relevant mitigation and measurement measures. The induction will address all elements of the CEMP as well as general and project-specific environmental management including, but not limited, to:

- Relevant details of the CEMP including purpose and objectives
- Obligations under the Construction Environmental Management Plan (CEMP) and associated sub plans
- Requirements of due diligence and duty of care
- Potential environmental emergencies on Site and the emergency response procedures
- Reporting and notification requirements for pollution and other environmental incidents
- High risk activities and associated environmental safeguards
- Working in or near environmentally sensitive areas
- Specific environmental management requirements and responsibilities
- Mitigation measures for the control of environmental issues
- The existence of EWMS for high risk activities
- Information relating to the location of environmental constraints.
- Key environmental issues including:
    - Erosion and Sediment Control, including basic Blue Book and site-specific issues
    - Flora and Fauna
    - Location of noise sensitive receivers and approved working hours
- Lipman-Environmental Policy (Appendix A4)
- General environmental awareness

Short-term visitors to site undertaking inspections / entering the site (such as regulators) will be required to undertake a visitor's induction and be accompanied by inducted personnel at all times.

Temporary visitors to site for purposes such as deliveries will be required to be accompanied by inducted personnel at all times.

The construction ESR (or delegate) will conduct the environmental component of the site inductions.

A record of all environment inductions will be maintained and kept on-site. The construction ESR may authorise amendments to the induction at any time. Possible reasons for changes to the induction may be Project modifications, legislative changes or amendments to this CEMP or related documentation.

An Induction Register is to be maintained on site by the Lipman Project Manager.

2.5.2 Toolbox talks, training and awareness

Toolbox talks will be one method of raising awareness and educating personnel on issues related to all aspects of construction including environmental issues. The toolbox talks are used to ensure environmental awareness continues throughout construction.

Toolbox talks will include details of EWMSs for relevant personnel. Toolbox talks will also be tailored to specific environmental issues relevant to upcoming works.

Relevant environmental issues include (but are not limited to):

- Erosion and sedimentation control
- Hours of work
- Emergency and spill response
- Aboriginal and non-Aboriginal heritage
- Threatened species, endangered ecological communities, clearing controls and vegetation protection
- Dust control.

Toolbox talk attendance is mandatory and attendees of toolbox talks are required to sign an attendance form and the records maintained.

Targeted environmental awareness training will be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. Topics covered may include those detailed above, or others deemed necessary in the lead up to or during construction.

A Training Register is to be maintained on site by the Lipman Project Manager.

2.5.3 Daily Pre-Start Meetings

The pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work.

The site Supervisor will conduct a daily pre-start meeting with the site workforce before the commencement of work each day (or shift) or where changes occur during a shift. Daily pre-start meetings are generally succinct in nature and take approximately 10-15 minutes.

The environmental component of pre-starts will be determined by relevant Supervisor and environmental personnel and will include any environmental issues that could potentially be impacted by, or impact on, the day's activities. All attendees will be required to sign on to the pre-start and acknowledge their understanding of the issues explained.

Pre-start topics, dates delivered and a register of attendees will be recorded and kept in the site office.

2.6 Working hours

Approved working hours on this project are:

Monday to Friday	0700 to 1700
Saturday	0700 to 1700
Sunday	No work (unless dispensation provided)

Public Holidays	No work (unless dispensation provided)

An Out of Hours Assessment (OOHA) would be prepared for all proposed out of hours works (OOHW), in accordance with the Appendix C2 (k) – Noise and Vibration Management Plan need to adjust to suit LPL.

Approvals for any changes will be included and attached as an additional appendix to this CEMP in Appendix C2 (q).

2.7 Communication

2.7.1 Internal Communication

Clear lines of communication throughout all levels and functions (e.g. management, staff and sub-contracted service providers), is key to minimising environmental impacts and achieving continual improvements in environmental performance.

The environmental representative will meet regularly with the client representative to discuss any issues with environmental management on-site, any amendments to plans that might be required or any new/changed construction activities.

In addition, environment representative will participate in toolbox talks on at least a weekly basis. This forum will provide an opportunity for the environment representative to communicate on environmental performance, to advise on any upcoming sensitive environmental matters for future work areas and to receive feedback from on-site personnel.

Further internal communications regarding environmental issues and aspects will be through awareness training as described in Section 2.5.

2.7.2 Liaison with EPA and government authority consultation

The ESR has the responsibility to report on the ongoing environmental performance of the Project to the client.

The Project Manager and the ESR are the two 24-hour contacts. They have the authority to halt the progress of the works if necessary. They are the key emergency response personnel during an environmental site emergency.

The ESR is the authorised contact person for communications with the client and the EPA on environmental matters and is responsible for informing all staff and subcontractors of the procedures through training eg: site-specific induction.

A report will be prepared on each occasion the site is visited by EPA, and client will be immediately notified.

2.7.3 Community liaison and/or notification

Community engagement will include the following:

- Letter distributed by client to consult all stakeholders.
- Letterbox drop (start of works letter) to sensitive receivers likely to be affected e.g. residents, businesses at least seven days prior to start of works, including information on:
    - The project
    - Construction period and construction hours
    - Contact information for project management staff
    - Complaint and incident reporting
    - How to obtain further information.
- Council Approval for the use of the compound sites
- Work updates via email to key stakeholders e.g. SOPA & Parramatta Council

- Proposal signage with a contact representative and contact phone number

2.7.4 Complaints management

A Complaints and Enquiries Procedure, consistent with AS 4269: Complaints Handling, will be developed for the Project as part of the Communications Plan, in accordance with the requirements.

All community inquiries and complaints related to the construction activities will be referred to:

- Lipman Project Manager
- Postal address: Level 6, 66 Berry Street North Sydney NSW 2060
- Email johnk@lipman.com.au

Records of all complaints received will include the following details:

- Date and time of the complaint
- Method by which the complaint was made
- Any personal details of the complainant
- The nature of the complaint
- Action taken in relation to the complaint and any follow up
- If no action taken, reasons why.

This information will be included in a Communications Register. The information contained within the register will be made available to the Client on request. SOPA will be advised of any complaints as they are received.

An initial response to complaints will be provided within 24 hours of a complaint being received. A further detailed response, including steps taken to resolve the issue(s) that lead to the complaint, will be provided within 10 days. All complaints will be closed off in the stakeholder database. At all times the stakeholder will be kept informed of when they will receive a response.

The construction ESR and PM will apply an adaptive approach to ensure that corrective actions are applied in consultation with the appropriate construction staff to allow modifications and improvements in the management of any environmental issues resulting in community complaints.

2.8 Emergency and Incident Planning

The list of emergency and key contacts is provided at the start of this document.

In the event of an environmental incident the Lipman Environmental Incident Classification and Reporting Procedure will be implemented. provided in Appendix A6, it should be noted that SOPA will be informed immediately of any incident occurring.

The procedure provides the Lipman approach to:

- Types of incidents
- Criteria for classifying of environmental incidents
- Processes, and legal requirements (eg Acts, Regulations, EPL), for reporting and notification of an environmental incident.

The procedure covers the classification and reporting of events such as, but not limited to:

- Spills of fuels, oils, chemicals and other hazardous materials
- Unauthorised discharge from sediment basins or other containment devices
- Potential contamination of waterways or land
- Accidental starting of a fire or a fire breaking out of containment

- Any potential breach of legislation, including a potential breach of an approval condition
- Unauthorised dumping of waste.

Spill response requirements would be managed in accordance with the Site-Specific Emergency Spill Plan, which includes a Spill Response Procedure to document the process to contain and clean up spills and leaks onsite.

All efforts will be undertaken immediately to avoid and reduce impacts of incidents and suitable controls put in place. Incidents will be close out as quickly as possible, taking all required action to resolve each environmental incident.

The EPA will be notified, in consultation with the Client representative, of any pollution incidents on or around the site via the EPA Environment Line (telephone 131 555) in accordance with Part 5.7 of the *Protection of the Environment Operations Act 1997* (NSW) (POEO Act). The circumstances where this will take place include:

- it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
- it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations)

Where an incident involves a potential impact to an Aboriginal site, Heritage NSW, will be notified and their input sought in closing out the incident.

The Contractor will provide all records of the environmental incidents and regulatory action to Client's Project team.

2.9 Monitoring, inspections and auditing

2.9.1 Environmental inspections

The Project HSE Advisor/Representative is responsible for ensuring task and workplace inspections are conducted in accordance with Lipman Policy -Report and to Conduct Incident Investigations, that include environmental controls and monitoring. Hazards identified during inspections are recorded in JDE and reported immediately to the Supervisor for rectification.

In addition, other inspections may be required and are addressed in the relevant aspect plans in Section 3 of this CEMP.

Copies of all environmental inspection reports prepared by the ESR and Client Staff will be kept with the project records and closed out within the agreed timeframes.

Weekly and post rainfall site inspections

The construction ESR will undertake daily and post rainfall inspections of the work sites to evaluate the effectiveness of environmental controls. Post rainfall inspections would be undertaken after more than 20mm of rain in a 24-hr period. The ESR will record inspection findings on an inspection checklist form, included in Appendix A7.

If any maintenance and/or deficiencies in environmental controls or in the standard of environmental performance are observed, they will be recorded on the checklist form. Records will also include details of any maintenance required, the nature of the deficiency, any actions required and an implementation priority. Actions will be closed out in accordance with the identified priority and evidence of close out would be kept on file.

Client's inspections

Client staff will undertake regular inspections of works sites, and in particular critical activities throughout construction of the Project.

A member of the Project construction and environment team will participate in all inspections, and records maintained. Deficiencies and required actions will be analysed and prioritised at the completion of the inspection and timeframes for implementation of corrective actions agreed.

2.9.2 Environmental monitoring

Monitoring will be undertaken to validate the impacts predicted for the Project, to measure the effectiveness of environmental controls and implementation of this CEMP. The monitoring requirements for required aspects are included in the relevant environmental management sub plans and summarised below in Table 2-2.

Environmental monitoring is conducted through various methods, including though not limited to:

- Day-to-day activities requiring formal and informal 'checks';
- Communication and consultation processes (e.g. SWMS reviews, pre-starts, toolboxes, meetings);
- HSE Inspections (Refer to Lipman PMP Hammertech);
- Permits and approval reviews;
- Formal monitoring through testing and recording;
- Incident investigation and reviews (Lipman PMP Hammertech); and
- Internal and external audit findings (Lipman PMP Hammertech).

Hazards identified during the above must be immediately reported to the Supervisor for action. Dependant on the nature of the hazard, where environmental impact occurs, it shall be managed in accordance with Lipman Policy -Report and Investigate Incidents. Records of environmental monitoring undertaken will be provided to Client as part of the monthly reports, or if the monitoring has been undertaken in response to a complaint, the results will be included in the incident or complaint investigation report.

Table 2-2: Summary of environmental monitoring requirements.

Description	Relevant Sub-Plan or CEMP Chapter	Monitoring Requirements
Noise and vibration monitoring	Noise and Vibration Management Plan (Appendix C2 (K))	Noise and vibration monitoring to be conducted if community complaints received regarding noise and vibration Vibration monitoring to be undertaken if vibration intensive equipment is used within or in close to minimum specified distances.
Water quality	Soil and Water Management Plan (Appendix C2 (G))	Visually monitor water quality within nearby receiving waters. Undertake water quality tests prior to any dewatering activities to confirm compliance with basin discharge water quality criteria. Monitor weather events and rainfall received. Undertake water quality testing if complaints received regarding the water quality within receiving waters.

Description	Relevant Sub-Plan or CEMP Chapter	Monitoring Requirements
Soil quality and waste classification	Soil and Water Management Plan (Appendix C2 (G)) Waste Management Plan (Appendix C2 (M))	Undertake soil testing and monitoring for any spoil to be removed from site to determine waste classification, if waste classification unknown.
Contamination	Waste Management Plan (Appendix C2 (M))	Undertake soil testing and monitoring for any suspected contamination, including for hazardous materials, including asbestos, if results unknown from previous contamination assessments.
Acid Sulphate Soil (ASS)	ASS Management Plan (Appendix C2 (M))	Undertake soil testing and monitoring if ASS or PASS is encountered and to determine effectiveness of any ASS treatment. Implement the unexpected finds protocol Appendix C2 (o) in the event of unexpected encounter with ASS or PASS
Dust	Chapter 3.4	Visually monitor for the presence of dust onsite to determine the effectiveness of dust controls. If dust complaints received, dust deposition gauges may be installed in consultation with the Client.
Bunded areas	Site Specific Emergency Spill Plan	Visually monitor bunding to determine effectiveness of drainage requirements and measures to ensure that bund capacities are maintained.

2.9.3 Auditing

Contractor internal audits

Internal auditing will be undertaken generally on a six-monthly basis throughout the Project. The purpose of auditing is to verify compliance with:

- This CEMP and associated Sub Plans
- Approval requirements
- Any relevant legal and other requirements (eg licenses, permits, regulations, contract documentation)
- An audit checklist will be developed and amended as necessary to reflect changes to this CEMP, subsequent approvals and changes to Acts, regulations or guidelines.

Independent external audits

External auditing will be undertaken by an independent environment auditor in accordance with ISO 19011:2014 - Guidelines for Quality and/ or Environmental Management Systems Auditing.

Table 2-3 Audit requirements

No.	Audit	Requirement	Timing	Responsibility	Recipient
1	Internal audit	Verify compliance with approval and legal requirements,	The first audit within three months of the commencement of construction and	ESR	Project manager

		specifications and construction documentation	then at six monthly intervals thereafter. The final submitted within five working days of contract completion date.		
2	External independent audit	Verify compliance with approval and legal requirements, specifications, construction documentation and any other commitments	Yearly	ESR	Project manager

2.9.4 Other reporting

Table 2-4 sets out the reporting requirements applicable to the Project, timing of the reporting, who is responsible for managing preparation of the reports and the intended recipient(s).

Additional reporting may be necessary as the works progress. In such a circumstance, Table 2-4 will be amended to reflect these changes.

Table 2-4 Reporting requirements

No.	Report	Requirement	Timing	Responsibility	Recipient
1	Monthly environmental reports	For incorporation in Project Monthly Reports including environmental statistics (ie incidents, regulatory action, complaints on environmental issues), regulatory and authority considerations, monitoring program performance and results, and key environmental issues	Monthly	Construction ESR	Project manager
2	Waste Avoidance and Resource Recovery Report	Information relating to wastes generated or recycled in accordance with Annexure G36/F	Annual (within 1 month from 1 July of the current calendar year, for the previous 12 months of the contract period)	Construction ESR	Project manager
3	Incident Reports	Reporting and notification requirements for pollution and other environmental incidents,	Following an incident	Construction ESR	Project manager

No.	Report	Requirement	Timing	Responsibility	Recipient
		as per the Incident Classification and Reporting Procedure, included in Appendix A6.			
4	Environmental risk assessment	Conducted for each construction stage, Project changes and significant issues.	Prior to construction during development of CEMP and as required thereafter.	Construction ESR	Project manager
5	Monitoring results	Report on monitoring data recorded and potential exceedances against criteria.	As required	Construction ESR	Project manager
6	Client and/or EPA environmental inspections	Response to matter raised by Client and/or EPA site inspections.	As required. inspection reports.	Construction ESR	Client / EPA

2.10 Environmental nonconformities

Any member of the Project team may raise a non-conformance or improvement opportunity. All incidents, complaints and non-conformances must be recorded via Hammertech. The register must be forwarded to the PM for initiating corrective/preventative actions or system improvements.

The Client Representative or other public authority may also raise a non-conformance or improvement opportunity using the same process.

A non-conformance is the failure or refusal to comply with the requirements of this CEMP and supporting documentation.

For each non-conformance identified, a corrective/preventative action (or actions) must be implemented. In addition, any environmental management improvement opportunities can be initiated as a result of incidents or emergencies, monitoring and measurement, audit findings or other reviews. Improvement opportunities may also result in the implementation of corrective/preventative actions.

Corrective/preventative actions and improvement opportunities will be entered into the contractor's quality system database and include detail of the issue, action required and timing and responsibilities. The record will be updated with date of close out and any necessary notes. The Hammertech system will be reviewed regularly to ensure actions are closed out as required.

Non-conforming activities may be stopped, if necessary, by the construction ESR, Project / Site Engineer following consultation with the Project Manager. The works will not commence until a corrective / preventative action has been closed out. The Client may also stop works in these circumstances. In such circumstances Works are to cease until verification that the failure has been rectified is received by the Client.

Verification that any environmental nonconformity that causes or potentially causes harm to the environment has been rectified and measures to prevent recurrence detailed

2.11 Records of environmental activities

2.11.1 Environmental records

The construction ESR is responsible for maintaining all environmental management documents and records as current at the point of use. Types of documents and records include:

- All site monitoring, inspection and compliance reports/records
- Correspondence with public authorities
- Internal and external audit reports
- Induction and training records
- Reports on environmental incidents, other environmental non-conformances, complaints and follow-up action
- Community engagement information
- Minutes of CEMP and construction environmental management system review meetings and evidence of any action taken
- CEMP and Sub Plans
- EWMS.
- Material Classification Records for Import & Export

All environmental management documents are subject to ongoing review and continual improvement. This includes times of change to scheduled activities or to legislative or licensing requirements.

Only the construction ESR, or delegate, has the authority to change any of the environmental management documentation. These documents would be held for five years after the actual completion date and be available to Client and EPA upon request.

2.11.2 Document control

The ESR will coordinate the preparation, review and distribution, as appropriate, of the environmental documents and records listed above. During the Project, the environmental documents and records will be stored at the main site compound.

A register and distribution list will identify the current revision of particular documents, records or data.

2.12 Management review

The Project Manager, HSE/ESR and other interested parties shall participate in management review at least 3 months following project commencement and six-monthly thereafter.

The intent of the review is to determine compliance of this CEMP, Project Risk Register and associated controls. The review shall be formally documented by way of meeting minutes and findings incorporated into this CEMP and associated instruments (e.g. SWMS, EWMS, Inspections, construction methodology).

Minutes to be distributed to monthly operational systems meetings

The frequency and purpose of specific reviews is outlined in Table 2-5 below.

Table 2-5 Management reviews

Meeting	Purpose	Frequency	Attendees
Management review	• Identification of areas of opportunity for improved environmental performance; • Analysis of the causes of nonconformities and deficiencies, including those identified in environment inspections and audits; • Verification of the effectiveness of corrective and preventative actions; • Highlighting any changes in procedures resulting from process improvement.	Monthly	Contractor management at minimum
Environment group	• A review of the aspects and impacts register, legal register and environmental induction • Consideration of monitoring, inspection and audit results • Consideration of incidents and any lessons learnt • Consideration of any new regulatory issues • A review of the effectiveness of erosion and sediment controls • Consideration of changes in operational needs such as resourcing • Feedback from management reviews.	monthly	ESR
Executive review	• Effectiveness of environmental management documentation implementation • Management effectiveness • Potential improvements to the environmental management documentation • Adequacy of resources • Findings of audits • Environmental objectives and targets • Environmental performance • Compliance with legal and other requirements • Critical non-conformance or repeated non-conformances • Organisation changes • Effectiveness of training and inductions.	Monthly	Operational Systems Meeting

2.13 CEMP/ Sub Plan revision

2.13.1 Revision

This CEMP shall be reviewed at least six (6) monthly and approved by the Project Manager, with all updates communicated to all Workers. The Project Manager shall ensure the CEMP remains controlled and up-to-date in accordance with Lipman Policy

Earlier reviews may be required where major changes are required to address potential or actual plan deficiencies raised through:

- An environmental or systems audit
- A major incident resulting in changes to method or controls
- Upon identification of new risks, including risks identified during risk register updates
- When non-compliances are identified
- Regulatory changes
- In response to project changes (including modifications and amendments)
- Management reviews.

A document review process ensures that environmental documentation including this CEMP is updated as appropriate for the specific works that are occurring on-site. This includes the management review process described in Chapter 2.12.

Should the document review process identify any issues or items within the documents that are either redundant or in need of updating, it is the responsibility of the construction ESR to prepare the revised documents. Minor revisions can be approved by the Project Manager however for major changes, the revised document will then be issued to the Project Manager for endorsement of the changes.

All revisions must be communicated to Workers (via Induction, toolbox talk, internal training etc.).

3 Construction - Operational control

A number of environmental management sub-plans support this CEMP. These documents are prepared to identify requirements and processes applicable to specific impacts or aspects of the Project activities. They address requirements of the development consent and other measures identified in the environment assessment documentation.

Environmental strategies may also be developed as required throughout the Project. These will also guide environmental management of potential impacts on-site.

A list of construction sub-plans for the Project, are provided in Table 3-1.

Table 3-1 Environmental management sub plans

Document name	Document number
Soil and Water Management Plan including: - Erosion and Sediment Control Plan (ESCP)	Appendix C2 (g)
Groundwater and Leachate Management Plan	Appendix C2 (h)
Major Events Plan	Appendix C2 (i)
Traffic and Pedestrian Management Plan	Appendix C2 (j)
Noise and Vibration Management Plan	Appendix C2 (k)
Air Quality Management Plan	Appendix C2 (l)
Waste Management Plan	Appendix C2 (m)
Asbestos Management Plan	Appendix C2 (n)
Unexpected Finds Protocol	Appendix C2 (o)
Flora and Fauna Management Plan	Appendix C2 (p)
Community Consultation Plan	Appendix C2 (q)

3.1 Soil and water quality management

A Soil and Water Management Plan (SWMP) has been developed to manage the soil and water risks on this project. This document is located in Appendix C2 (g) and is the master document for all soil and water quality control measures. This plan incorporates a site specific and detailed Erosion and Sediment Control Plan (ESCP).

The following principles, detailed within the Blue Book (Landcom, 2004) outline the overall approach to erosion and sediment control for the site:

- Minimising surface disturbance and restricting access to undisturbed areas.
- Progressive rehabilitation/stabilisation of infrastructure areas.
- Separation of runoff from disturbed and undisturbed areas, where practicable.
- Construction of surface drains to control and manage surface runoff.
- Construction of surface dams or use of existing/modified water storages to contain runoff up to a specified design criterion.

The following control measures will be implemented to ensure safeguards are in place

Safeguard	Safeguard	Person Responsible	Evidence of Action
All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings. Site-specific training will be provided to personnel engaged in activities or areas of higher risk, such as dewatering management and works to be undertaken within or adjacent to waterways.	Good Practice	PM	
A Construction Soil and Water Management Plan (CSWMP) (Appendix C2 (g)) will be prepared and implemented as part of the CEMP. The CSWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction.	Good Practice	PM/ ESR	
Erosion and sedimentation controls will be checked daily and maintained on a regular basis (including clearing of sediment from behind barrier) and records kept and provided on request	Good Practice	PM/ ESR	
Erosion and sediment control measures will not be removed until the works are completed and areas are stabilised Work areas will be stabilised progressively during the works.	Good Practice	PM/ ESR	
A site specific Erosion and Sediment Control Plan (ESCP) will be prepared and implemented as part of the CSWMP. The ESCP will include arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather	Good Practice	PM/ ESR	
Erosion and sediment control measures will be implemented and maintained and will include: • Sediment Dams to retain runoff from rainfall events • Collection Drains to convey water to storage areas • Sediment fences and similar check controls prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces • Divert clean water around the site.	Good Practice	PM/ ESR	
Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) will be undertaken on a regular basis to identify any potential spills or deficient silt curtains or erosion and sediment controls.	Good Practice	PM/ ESR/ S	
Water quality control measures will be implemented to prevent any construction materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways.	Good Practice	PM/ ESR/ S	

Safeguard	Safeguard	Person Responsible	Evidence of Action
Measures to manage accidental spills and leaks will be detailed in the site-specific emergency spill plan, included in the CSWMP (Appendix C2 (g)) and implemented on site.	Good Practice	PM/ ESR/ S	
Weather conditions will be monitored to identify potential flood conditions and manage potential flooding impacts in accordance with the CEMP.	Good Practice	PM/ ESR/ SE	
Erosion and sedimentation control measures will be inspected weekly, and immediately prior to and following significant rainfalls on the site (i.e. >25mm)	Good Practice	PM/ ESR/ S	
Sediment management structures will be inspected routinely (daily) following rain events greater than 25mm in a 24 hour period.	SWMP	PM/ ESR/ S	
Site entrances/exits to be stabilised using a 3mx3mx0.2m section of suitable aggregate (not sandstone) normally 30- 60mm diameter. Additionally, a truck rumble grid (i.e. cattle grid) will be installed for removal of soil from truck wheels prior to leaving site.	SWMP	PM/ ESR/ S	
Trucks are to remain on hardstand areas where possible. Where trucks and machines are required to track over exposed soil, wheels/tracks are to be cleaned and inspected prior to departing the site.	SWMP	PM/ ESR/ S	
Stockpiles of excavated material are not exceed 4 metres in height and have contours as low, flat, elongated mounds with slopes no steeper than 2(H):1(V) grade.	SWMP	PM/ ESR/ S	
Stockpiles of excavated material are separated and maintained to prevent cross contamination.	SWMP	PM/ ESR/ S	
Place stockpiles more than 2 meters (preferably 5 meters) from existing vegetation, concentrated waterflow (e.g. the Swale, sediment basin, spillway, or slopes >10%), roads and hazard areas.	SWMP	PM/ ESR/ S	
Where stockpiles are in place for more than 10 days, stabilise (e.g. with spray grass or geofabric)	SWMP	PM/ ESR/ S	

3.2 Groundwater and Leachate management

A Groundwater and Leachate has been developed to manage potential groundwater contaminated land on this project. This document will be located in Appendix C2 (h) and whilst the below table provides a summary of risks and controls, the Groundwater and Leachate Management Plan is the master document for controls associate with groundwater and leachate risks.

The overall approach to groundwater and leachate management for the USS Project has been developed with consideration to the SOPA Remediated Lands Management Policy, which has the following relevant requirements:

- Ensure that approvals issued under the Environmental Planning and Assessment Act 1979, the Authority's Parklands Plan of Management and the Authority's Work Permit System require compliance with relevant provisions of the Authority's Remediated Lands Management Plan.

- Development Applications associated with development of remediated land or contaminated sites at Sydney Olympic Park must take into consideration the requirements of State Environmental Planning Policy No 55 – (Managing Land Contamination).
- Ensure leachate transfer and treatment is conducted by appropriately licensed operators.
- Comply with the reporting and notification requirements of the Protection of the Environment Operations Act 1997 in responding to environmental incidents and in managing discharges to the Parramatta River.

The design levels for most of the civil structure are above 5 mAHD and will not intersect the watertable at 1-2 mAHD. The structural works expected to interact with the watertable include the advancement of approximately 370 piles) of 0.450m – 0.900m diameter to approximately -15 mAHD i.e. intersecting approximately 10 m of the unconfined aquifer.and bedding on sandstone

Groundwater that does not readily soak into the subsurface immediately surrounding the pile location shall be captured (e.g. in a temporary pit adjacent the piling location) then transferred to a holding tank using a sump pump of nominal size. The holding tanks shall have adequate capacity to accommodate the rate of excess groundwater requiring removal.

Considering the anticipated quantities, constituents requiring treatment and construction programme, disposal off excess groundwater/ leachate to an off-site treatment facility is the preferred method. The Cleanaway facility within Sydney Olympic Park routinely receives leachate from the SOPA landfills. Cleanaway are licensed to receive and collect the groundwater (liquid waste) using tankers up to 20,000 L capacity.

Should any contaminants that are not registered or identified be discovered the Unexpected Finds Protocol will be followed.

The following control measures will be implemented to ensure safeguards are in place

Safeguard	Safeguard	Person Responsible	Evidence of Action
Groundwater that does not readily soak into the subsurface immediately surrounding the pile location shall be captured (e.g. in a temporary pit adjacent the piling location) then transferred to a holding tank using a sump pump of nominal size (e.g. 50mm or 75mm diameter). No groundwater run-off will be allowed to leave piling area.	GLMP	ESR/ PM / Foreman	Water transfer record
Pre-treatment of suspended sediment should be completed prior to the transferring groundwater to the holding tank eg. using filter cloth around pump inlets, a sediment tank	GLMP	ESR/ PM / Foreman	Inspection
If asbestos works are being undertaken, any groundwater will be adequately captured and transferred to tanks and not directed to sediment basins. All sumps, gradients and sediment controls will be monitored and maintained to ensure no surface run-off. Any filter material used in the pre-treatment of groundwater should be disposed of as asbestos waste if work is being undertaken in an asbestos area.	GLMP	ESR/ PM / SE	Inspection
The holding tanks shall have adequate capacity to accommodate the rate of excess groundwater requiring removal. PRM suggest two 20,000 Litre capacity tanks would be sufficient so that one tank remains available while the other tank is being emptied.	GLMP	ESR/ PM / SE	Inspection

Safeguard	Safeguard	Person Responsible	Evidence of Action
The Environmental Consultant is to be notified when a holding tank is nearing capacity for sampling of collected groundwater/leachate. One groundwater sample per batch/tank will be analysed for the constituents in Table 4 and compared to ANZG2018 criteria and baseline groundwater quality to confirm chemical concentrations prior to disposal.	GLMP	ESR/ PM / SE	Communication record Inspection Test results
In the event dewatering (lowering) of the water table is required to enable the civil works a structural engineer (or RICS accredited building surveyor) should be engaged to assess potential settlement impacts on neighbouring properties and structures and consultation with SOPA will be required prior to any lowering of the water table.	GLMP	ESR/ PM /	Inspection record Report

3.3 Spill prevention and response

A Site-Specific Emergency Spill Plan (SSESP) will be developed to manage spill prevention and response on this project and captured in the induction training and EWMS.

The Project will involve a range of activities incorporating various machinery, plant and equipment that will operate on the work sites and the compounds. These activities will involve the use and storage of fuels, oils and other hazardous chemicals. In order to assess the level of impact, the broad categories of construction activities that have the potential to result in a potential spill include:

- Site establishment
- Refuelling of plant and equipment
- Maintenance and cleaning of plant and equipment

The following environmental impacts may occur as a result of the aspects outlined above:

- Soil and water pollution.
- Damage or loss of flora to be retained, poisoning of any fauna.
- Adverse human health issues.
- Damage to the landscape and local amenity.
- Compliance issues, breach of EPL resulting in fines and/or jail.
- Increased costs for remediation of the site.
- Community concern.

The Project will ensure that all hazardous substances including fuels, chemicals and liquids are stored in impervious bunded structures in accordance with the manufacturer's instructions and the SDS. These structures will be locked; with an impermeable floor to minimise the impact of any spillage or contamination of the site and adjoining areas.

Refuelling of plant and equipment will not be undertaken where there is direct drainage to a waterway or environmental sensitive areas without appropriate temporary bunding being provided. No refuelling will be undertaken over water

Spill kits will also be readily available nearby if drums of chemicals and fuels need to be used outside a bunded area and an emergency spill kit will be kept on site atall times.

The following control measures will be implemented to ensure safeguards are in place

Safeguard	Safeguard	Person Responsible	Evidence of Action
All staff will be made aware of this Plan and the Spill Response Procedure. A copy of the Spill Response Procedure will be displayed at the site compound, in each spill kit and in each field-services vehicle.	Good Practice	PM	
All staff will be made aware of the location of emergency spill kits and will be trained in their use.	Good Practice	PM/ ESR/ S	
The location of bunded containers will be included on the ESCP. If required on-site, the chemicals will be transported to and from the compound site immediately. Drip trays will be used when chemicals are being used and decanted.	Good Practice	PM/ ESR/ S	
All chemicals are stored in accordance with the manufacturer's instructions and the MSDS.	Good Practice	PM/ S	
Any stored chemical, fuel and lubricants will be stored in self bunded hazardous material chemical containers at the site compounds. Only the minimum amount of plant, equipment and materials will be stored within the compound. All chemicals will be stored as far away from waterways as possible and correctly within an impervious double bunded area.	Good Practice	PM/ S	
If drums of chemicals and fuels must be used outside a bunded area, a spill kit will be readily available nearby, unsealed drums will not be left unattended, and they will be returned to the bunded area for storage overnight.	Good Practice	S	
Maintenance and cleaning of plant and equipment will be done within the allocated site compound areas only. The following controls will be put in place for this activity: • Washdown works in bunded areas • Installation of shade cloth/ geofabric controls to filter water during cleaning of plant and equipment. • Thinners, degreasers and other cleaning chemicals shall not be used onsite.	Good Practice	PM/ S	
Vehicles, equipment and plant must be frequently maintained and serviced and regularly inspected for fluid leaks	Good Practice	PM/ S	
Refuelling of plant and equipment will occur on impervious double bunded areas on land. No refuelling will be undertaken over water.	Good Practice	S	
Clean up all chemical spills immediately, with reference to the Spill Response Procedure	Good Practice	S	

3.4 Air quality

Air quality and dust suppression measures to minimise the impact of dust, offensive odour, and other air pollutants on the surrounding environment, including adjacent properties and sensitive places are included below within this CEMP. Further measures to address air quality are included in the erosion and sediment controls included within the AQMP (Appendix C2 (k)) which is the master document for all air quality management controls.

The following principles outline the overall approach to the air quality management for the site:

- Ensure appropriate measures are implemented to address the relevant conditions outlined in the Development Consent.
- Ensure best management practice controls and procedures are implemented during the construction activities to avoid or minimise the risk of air quality and odour impacts.
- Minimise dust generation and any other potential air quality impacts as a result of construction activities.
- Implement proactive measures to mitigate impacts at the source, path and receiver to minimise complaints from and potential impacts to sensitive receivers.
- Manage potential air quality issues so they are identified and controlled to meet legislative requirements.

Air quality monitoring will be conducted during earthworks activities and during construction activities as detailed in the AQMP.

The following control measures will be implemented to ensure safeguards are in place

Safeguards	**Safeguard**	**Persons responsible**	**Evidence of action**
Pre-works			
All construction facilities erected on site will be designed and operated to minimise the emission of smoke, dust, cement dust and other substances into the atmosphere.	Good Practice	ESR	Environmental inspection Checklist
All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project, and the identification/location of sensitive receivers. This will include up-front site induction and regular "toolbox" style briefings.	Good Practice	ESR / PM / S	Induction
During-works			
The following measures will be implemented to minimise the risk of air pollution during the project works: • Areas of exposed soil will be sprayed with water or hydroseeded, covered with geofabric or other covering, or compacted if airborne dust is observed • Stockpiles will be sprayed with water, covered, seeded or sealed, if airborne dust is observed • Wind conditions to be monitored and works adjusted accordingly • No materials or vegetation is to be burnt on site • Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely • Implement a progressive rehabilitation strategy for exposed surfaces and disturbed areas.	Good Practice	ESR / S	This CEMP Environmental inspection Checklist
Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust. Where possible recycled or site captured water will be used for dust suppression.	Good Practice	PE	Environment Inspection Checklist
Stockpiles or areas that may generate dust are to be managed to suppress dust emissions in accordance Stockpile Site Management Guideline.	Good Practice	PE/ESR	Plant inspection records

Safeguards	Safeguard	Persons responsible	Evidence of action
Loads containing loose materials will be covered when moved around site or offsite.	Good Practice	PE /S	Environmental Inspection
On-site vehicle speed limits (i.e. 10km/hr) are to be established and enforced.	Good Practice	PE/S	Environmental Inspection
A stable entry / exit point is to be established including rumble grids and wash bays where required	Good Practice	PE/S	Environmental Inspection
Visual checks will be done on exhaust-system emissions at the vehicle start up inspection.	Good Practice	PE/S	Maintenance Records
Air quality monitoring will be undertaken daily during site establishment including: • Visual monitoring of dust levels and work activities which have the potential to generate dust to determine the effectiveness of controls • Weather forecast monitoring to determine when adverse conditions are likely to occur including, but not limited to, temperature, wind speed and direction, and rainfall	Good Practice	PE/ ESR	Environment Inspection
If the dust control measures are not adequately restricting the generation of dust under the prevailing conditions at any time, the work activities that are causing the dust will cease and be re-programmed. A visual check will be used to establish whether controls are adequate and whether additional measures are required.	Good Practice	PE/ ESR/S	Environment Inspection Checklist
Stockpiles are to shaped and must be no greater than 4m in height, with batter slopes no steeper than 2:1.	Good Practice	PE/S	Environment Inspection Checklist
Stockpiles susceptible to wind erosion that are to remain onsite for more than 48hrs, will be protected by: • covering them with geofabric or black plastic • seeding with temporary winter crop cover or • sealed with a soil binder or tackifier	Good Practice	ER/S	Environment Inspection Checklist
Exposed areas are to be stabilised with planting as soon as reasonable and feasible where planting is specified and landscaping design is proposed.	Good Practice	PE/S	Environmental Inspection Landscape Design
Vehicles and activities are to be confined to the designated work areas to prevent any inadvertent encroachment into adjacent disturbed areas, which may increase the potential for dust impacts. Unsealed roads will be regularly sprayed with water.	Good Practice	PE/S	Environmental Inspection Water Cart logs
Vehicles and machinery will be subject to regular maintenance checks and will be visually monitored for excessive emissions during environmental inspections.	Good Practice	PE/S	Plant maintenance records
Locate vehicle, plant and equipment parking and storage areas as far from sensitive receptors as reasonably practicable.	Good Practice	PE/S	Environmental Inspection
Stage construction activities (e.g. clear and grub, excavation and fill) to minimise areas of exposed soil at any one time where practical.	Good Practice	PE/S	Environmental Inspection
Spill kits will be available on site during construction activities. All spills will be cleaned up immediately and reported to the site ESR/PM	Good Practice	PE/S	Environmental Inspection

Safeguards	Safeguard	Persons responsible	Evidence of action
If any odour or vapours/gases are detected, the unexpected finds protocol must be followed (Appendix C2 (o))	Good Practice	PE/S	Unexpected Finds Register
Post Works			
All areas disturbed by the construction works will be restored and stabilised to prevent dust erosion, in accordance with landscaping design.	Good Practice	ER/S	Environmental Inspection Landscape Design

3.5 Fire safety and burning off

This section is to outline how the project complies with *Rural Fires Act 1997* (NSW), and the *Local Government Act 1993* (NSW) and is guided by the NSW Rural Fire Service publication "Equipment and Machinery Use in Bush Fire Prone Areas".

The following control measures will be implemented to ensure safeguards are in place

Safeguards	Safeguard	Persons responsible	Evidence of action
Pre-works			
All personnel involved in welding, grinding, thermal or oxygen cutting, heating or other fire or spark-producing operations will be trained in fire prevention, safety and basic fire-fighting skills.	Good practice	PE/S	Induction Training records Prestart Toolbox
During-works			
Burning off is not permitted. There must be no burning of vegetation or lighting of fires on site.	Good practice	PE/S	Prestart Toolbox CEMP
Total fire ban declarations and resultant work restrictions will be communicated to staff via the site supervisor during the daily prestart meeting.	Good practice	PE/S	Prestart Toolbox minutes
The following fire-fighting equipment will be provided on site and in vehicles to ensure the safety of public and property: • Fire extinguishers will be fitted to all site vehicles • Fire extinguishers will be located within the site compounds.	Good practice	PE/S	Fire extinguisher register Prestart Toolbox
Plant that could discharge sparks will be fitted with spark arresters during High Fire Danger periods.	Good practice	PE/S	Prestart Toolbox Inspection
Cutting, welding, grinding and other activities that can generate fires will be ceased in the open on days when a total fire ban is proclaimed.	Good practice	PE/S	Prestart Toolbox Inspection

3.6 Noise control

A Noise and Vibration Management Plan (NVMP) developed to manage the noise risks on this project. This document is located in Appendix C2 (k) and is the master document for all noise and vibration management controls.

The DECC Interim Construction Noise Guideline (ICNG, July 2009) provides guidelines for the assessment and management of construction noise. The ICNG focuses on applying a range of work

practices to minimise construction noise impacts rather than focusing on achieving numeric noise levels.

The main objectives of the ICNG are to:

- Identify and minimise noise from construction works
- Focus on applying all 'feasible' and 'reasonable' work practices to minimise construction noise impacts
- Encourage construction during the recommended standard hours only, unless approval is given for works that cannot be undertaken during these hours
- Reduce time spent dealing with complaints at the project implementation stage
- Provide flexibility in selecting site-specific feasible and reasonable work practices to minimise noise impacts.

The following control measures will be implemented to ensure safeguards are in place

Safeguards	Safeguard	Persons responsible	Evidence of action
Pre-works			
The site induction program will include a section for noise and vibration issues outlining measures such as: • avoid use of radios during work outside normal hours • avoid shouting and slamming doors • operate machines at low speed or power and switching off when no being used rather than left idling for extended periods • minimise reversing • avoid dropping materials from height and • avoiding metal to metal contact of materials • consideration of works and equipment selection within close proximity of nearby structures	All	ESR/ PE/S	Induction Training records
During-works			
Work may be undertaken outside of normal working hours without additional approval only during the following times: • To facilitate oversized deliveries to site outside of road curfew restrictions • To enable project staff to work within site compounds undertaking office based duties not audible at nearby receivers. • Work during an emergency, where such work is necessary to avoid the loss of lives, property and/or prevent environmental harm. • If any other out of hours work (OOHW) is proposed, an Out of Hours Assessment (OOHA) is to be prepared and approved.	All	ESR/ PE/S	OOH Procedure
All construction plant and equipment used on site must be, in addition to other requirements: • fitted with properly maintained noise suppression devices in accordance with the manufacturer's specifications • maintained in an efficient condition • operated in a proper and efficient manner to minimise noise and vibration	All	ESR/ PE/S	Prestart Toolbox Inspection

Safeguards	Safeguard	Persons responsible	Evidence of action
• keep engine access covers closed • turned off when not in use.			
Switch off engines when equipment is not in use for extended periods	All	ESR/ PE/S	Site Checklist monitoring
Avoid shouting, slamming doors and use of loud non-CB radios.	All	ESR/ PE/S	Prestart Toolbox Inspection
Schedule vehicle delivery times so that they are reasonably practical and feasible to the recommended construction hours to minimise noise impacts on nearby receivers from heavy vehicle movements and deliveries	All	ESR/ PE/S	Prestart Toolbox Inspection
Minimise vehicle movements outside working hours stated in this plan, including loading and unloading operations	All	ESR/ PE/S	Prestart Toolbox Inspection
No plant is to "warm up" outside working hours or days, unless operation is part of an approved OOHW activity	All	ESR/ PE/S	Prestart Toolbox Inspection
Noise and/ or vibration monitoring will be undertaken when required to assess performance against the construction noise and vibration criteria, particularly during any noisy or vibration intensive works. Noise and vibration monitoring requirements are detailed in the NVMP.	All	ESR/ PE/S	Prestart Toolbox Inspection

3.7 Ground vibration and air blast

A Noise and Vibration Management Plan (NVMP) developed to manage the vibration risks on this project. This document is located in Appendix C2 (k). There is to be no blasting undertaken as part of the works.

3.8 Biodiversity (Flora & Fauna Management)

A Fauna and Flora Management Plan (FFMP) developed to manage the biodiversity risks on this project. This document is located in Appendix C2 (p) and is the master document for all flora and fauna management and control measures.

Six species of birds were recorded on site during field surveys as part of the EIS assessment. These were all native, highly mobile, mostly larger species, and well adapted to living in a highly urbanised environment. Another avian species using the area was evidenced by a dropped primary feather. Three species of small lizards were also recorded during field surveys, and a fourth is reportedly often sighted around the bioswales.

No threatened species, endangered ecological communities, endangered populations, or critical habitat were recorded on the Project site, although several were reported from nearby areas.

Large populations of the Green and Golden Bell Frog (Litoria aurea) have been recorded regularly in the nearby Narawang Wetlands, and this area is also believed to provide habitat for the migratory Latham's Snipe (Gallinago hardwickii).

South of the subject site is Haslam's Creek, which has a narrow band of Estuarine Saltmarsh, an Endangered Ecological Community, along lengthy sections of creek bank near the subject site. Within the EEC is a species of threatened flora: Narrow-leaved Wilsonia (Wilsonia backhousei), which has a limited distribution in intertidal habitats.

The following control measures will be implemented to ensure safeguards are in place

Safeguards	Safeguard	Persons responsible	Evidence of action
Pre-works			
A suitably licenced and experienced ecologist should be on site to ensure that animals (GGBF, Lizards etc.) are rescued and relocated prior to construction works.	All	ESR/ PE/S	
Prior to any construction, including the clearing of swales – The frog fence exclusion fence must be installed then inspected and endorsed by both the appointed ecologist and by a representative of SOPA to confirm it is consistent with the design specifications.			
During-works			
During and immediately following high rainfall, (i.e. >25mm in 24hours) an ecologist will be engaged to monitor for calls on site from the Green and Golden Bell Frog.	All	ESR/S	
Prior to and during the demolition of Swales – the pipe outlets must be capped at both the outer and inner ends to prevent fauna from coming into the worksite through these pipes or getting trapped within the pipes.	All	ESR/S	
Tree protections (trees to be retained) are a hold point for inspection by the appointed ecologist and SOPA. No trees are to be removed prior to obtaining SOPA's confirmation to do so.	All	ESR/S	
Construction work must only be undertaken during daylight hours as defined by condition D2 of the development consent i.e. 0700-1700 Monday to Saturday	All	ESR/S	
No works are to be undertaken within the E2 Environmental Conservation zones surrounding the site including stormwater connection works adjacent Nuwi Wetland without prior approval and consultation	All	PE/S	
Construction dewatering of rainwater/stormwater discharging to Nuwi Wetland must be undertaken in accordance with the approved Soil Water Management Plan for the project and in accordance with the SOPA Infrastructure Design and Construction Manual	All	ESR/S	
Works outside the frog fence exclusion fence e.g. trenching for installation of services and stormwater line adjacent Hill Road Footpath. Trenches must be backfilled each night and exposed pipes capped, to reduce the risk of fauna becoming entrapped.	All	ESR/S	
The existing swale (currently concealed by mulch) must be reinstated following installation of the stormwater line adjacent Hill Road footpath.	All	ESR/S	

3.9 Waste Management and Resource Recovery

A Waste and Resource Management Plan (WRMP) developed to manage waste and resource opportunities and risks on this project. This document is located in Appendix C2 (m) and is the master document for all waste management activities and controls.

The WMP has been developed with the consideration of the waste hierarchy as outlined by the NSW EPA (2014) and depicted in the Figure below. Where possible, waste generated onsite will be managed in general accordance with these principles.

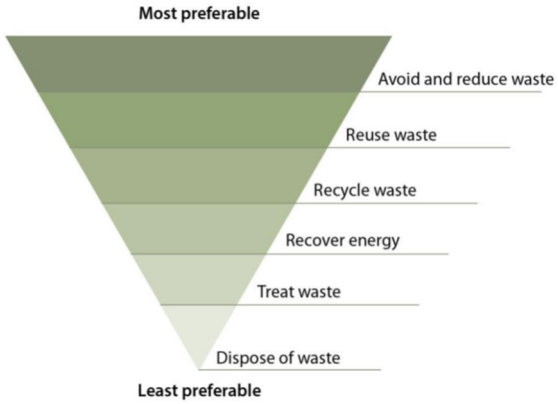


Figure – Waste Hierarchy - Reference: NSW EPA Waste Avoidance and Resource Recovery Strategy (2014 – 2021).

Waste will be classified for offsite disposal to ensure waste materials are disposed of in accordance with the requirements of the NSW Protection of the Environment (Waste) Regulation 2014. Before transporting waste from the Site, the following must occur:

- Ensure the waste has been correctly characterised.
- Ensure the waste transporter is licensed or legally allowed to transport the waste.
- Ensure the waste is correctly loaded and covered.
- Ensure the transport contractor follows the correct procedures for entering and exiting the site so roadway cleanliness is maintained.
- Ensure the landfill facility accepting the waste is licensed to accept the class of waste being transported.

All waste generated onsite will be appropriately tracked and recorded on the Waste Register presented in the WMP.

All AAS/PASS controls can be located in section 6 of the Waste Management Plan in Appendix C2 (m).

3.10 Use of pesticides

The following control measures will be implemented to ensure safeguards are in place

Safeguards	Safeguard	Persons responsible	Evidence of action
Pre-works			
All personnel involved in the use of pesticides will wear appropriate Personal Protective Equipment (PPE), be trained in their application and hold appropriate licence prior to commencing work.	All	ESR/ PE/S	Induction Training records
All employees and contractors working at the site are to be provided with Asbestos Awareness Training as part of the site induction programme.	All	PM/ ESR	Induction Training record
Visitors to the site are to be briefed on the presence of ACM at the site (where applicable).	All	PM/ ESR	Induction Training record

Safeguards	Safeguard	Persons responsible	Evidence of action
During-works			
Any pesticides applied will be approved for common use as detailed. Only pesticides registered for use near water may be used near water.	All	ESR/S	Herbicide use register
Herbicides used on site are to be applied only by hand or by hand-held equipment and, when applied outdoors on any one occasion, no more than 5 litres (or 5kg) of concentrate or 20 litres (20kg) of ready-to-use product will be used.	All	ESR/S	Herbicide use register
All herbicide use will be recorded and copies provided to the client within 24 hours of application. All personnel managing, handling or applying pesticides must hold appropriate certification and maintain log books.	All	ESR/S	Herbicide Application Record
No pesticides will be applied in publicly assessable locations.	All	ESR/S	Herbicide use register
Herbicide use will be avoided: • on hot days when plants are stressed • on plants whose seed has already set • within 24 hours of rainfall or when rain is imminent • when winds might cause drift into non-target areas.	All	PE/S	Prestart Toolbox Inspection

3.11 Asbestos Management

The following control measures will be implemented to ensure safeguards are in place

Safeguards	Safeguard	Persons responsible	Evidence of action
Pre-works			
All employees and contractors working at the site are to be provided with Asbestos Awareness Training as part of the site induction programme. The induction programme should also outline the formal procedures to follow should ACM be identified on site.	All	PM/ ESR	Induction Training record
Visitors to the site are to be briefed on the presence of ACM at the site (where applicable).	All	PM/ ESR	Induction Training record
During-works			
If suspected ACM or asbestos impacted soils are observed outside of an Asbestos Work Area, stop work immediately and notify the site supervisor as per the Unexpected Finds Protocol (appendix C2 (o))	All	PE/S	Incident register Inspection record
The Class A Licensed Asbestos Removalist (i.e. Principal Contractor working under the license of a Class A asbestos removal subcontractor) will be responsible for developing and implementing an Asbestos Removal Control Plan (ARCP) in accordance with SafeWork NSW CoP: How to Safely Remove Asbestos 2019 and be applicable to all aspects of ACM removal and associated works undertaken at the site.	All	PE/S	Asbestos Removal Control Plan

The Class A Asbestos Removalist will be responsible for notifying SafeWork NSW of the asbestos removal activities. This notification will be provided to URBNSURF and relevant stakeholders upon. A copy of the SafeWork NSW Notification must be displayed onsite.	All	PE/S	Safework NSW notification of ACM removal
Asbestos fibre air monitoring will be conducted by Licenced Asbestos Assessor during all earthworks and piling works where site fill/soil is being disturbed. Immediate implementation of controls (outlined in Table 6 of Appendix C2) if air monitoring results are equal to or exceed 0.01 fibres/mL	All	PE/S	Air Monitoring reports
Personnel requiring to work within ACM designated areas or are likely to come into contact with asbestos are required to comply with minimum PPE requirements (including records of up to date fit tests), operating plant are to be fitted with HEPA filters and decontamination procedures to be implemented in accordance to the Asbestos management plan attached in (Appendix C2).	All	PE/S	Fit test records and induction records
Asbestos impacted soils requiring temporary stockpiling on site shall be placed in a suitable location and shall be surrounded by flagging or other suitable material to clearly delineate their boundaries.	All	PE/S	Inspection report
Clearance inspections and associated validations will be required once ACM contaminated soil is removed and when the ACM contaminated soil is capped as part of the final design.	All	PE/S	Clearance Report

3.12 Unexpected Finds Protocol

The objective of Unexpected Finds Protocol is to document the management responsibilities, controls and procedures to mitigate potential environmental and human health impacts associated with unexpected contamination and asbestos finds that may be encountered during construction works. The project specific Unexpected Contamination Finds is prepared and will be implemented as part of this CEMP.

An unexpected find is defined as potential contaminated land or asbestos that was not previously identified in this CEMP and/or other sub-plans or during pre-construction investigations.

All workers will undertake a detailed site induction which will include reference to all known and potential environmental hazards such as asbestos and other potential contaminants as outlined

Personnel involved in construction works in the project area will be made aware of, and trained, in the recognition of potential unexpected finds. Training will be undertaken as a part of general site induction and refreshed periodically at toolbox meetings. Training will provide general awareness for recognition of potential contamination and hazardous materials, so that works can be suspended temporarily to allow evaluation by an appropriately qualified person.

Project workers will be trained in identifying the following:

- Soil that appears to be contaminated based on visual and olfactory indicators
- Asbestos (i.e. either bonded or friable)
- Groundwater or surface water that appears to be contaminated based on visual and olfactory observations (including potential hydrocarbon sheens on the water surface, free phase liquids such as petroleum fuel, discolouration etc.)
- Drums or USTs
- Fill containing waste (e.g. ash, slag, refuse, demolition materials). Asbestos is likely to be encountered in some project areas (refer to CEMP and AMP).

If ‘Unexpected Finds’ are observed, all work activities within vicinity of an unexpected finds area will be ceased and work area will be delineated. An appropriately qualified and skilled Subject Matter Expert (SME) such as Licenced Asbestos Assessor (LAA) and/or Environmental Consultant will be contacted for further evaluation and recommendation.

The Lipman Project Manager and/or Environmental Manager will be responsible for making the Site Manager aware of the nature of these prior to construction activities commencing in those areas

3.13 Work in environmentally sensitive areas

Is addressed in section 2.2.4 of this CEMP.

Sensitive area maps are included in Appendix A5.

3.14 Environmental incident notification and reporting

Is addressed in section 2.8 of this CEMP. The response to environmental emergencies and incidents is to be consistent with the Incident Classification and Reporting Procedure (Appendix A6), with the additional measure of immediately notifying SOPA of any emergencies and incidents

3.15 Site and Ancillary facilities

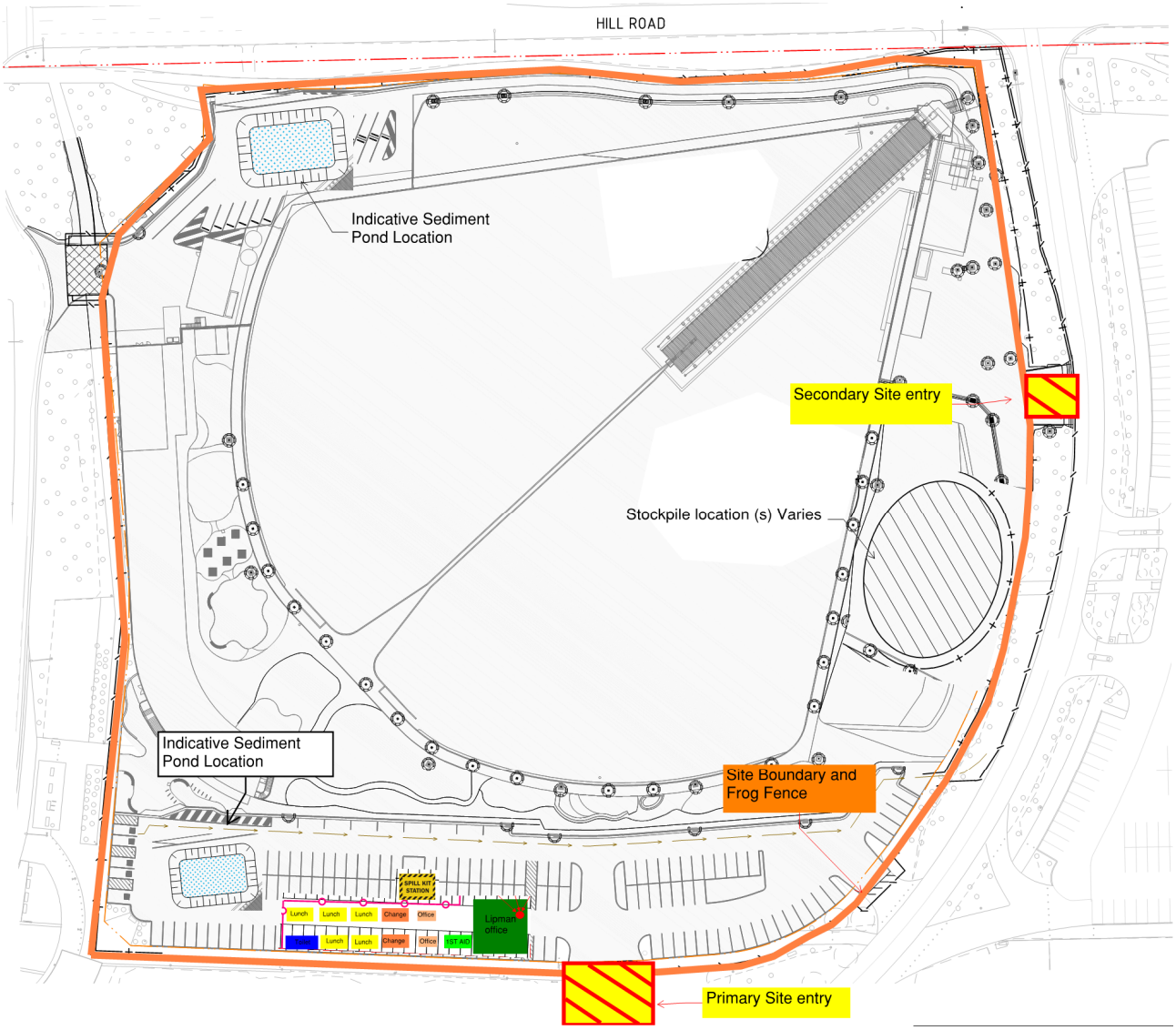
This CEMP addresses the following two site compound areas:

These are essential to support the delivery of the Project. The compounds will be required for the following activities:

- Plant, equipment and vehicle parking
- Material storage
- Waste storage e.g. general waste bins
- Site office
- Amenities, eg lunch rooms and ablution facilities
- Concrete washout area

The establishment of these compounds was addressed within the Site Establishment Management Plan, prepared prior to the development of this CEMP for these and other preliminary works.

Figure 3-1 Location of Compound



The following control measures will be implemented to ensure safeguards are in place

Safeguards	Safeguard	Persons responsible	Evidence of action
Pre-works			
A pre-construction land condition assessment report for each of the compound sites will be undertaken by an approved environmental consultant to identify any existing waste or stored materials on the land prior to use for this project and provided to the Client. The compound sites are located on existing hardstand areas (car park and former tennis courts) and will contain site office, lunchroom, ablutions, covered walkways, staff parking, stockpile area, laydown hardstand for materials. Indicative locations of these are included in the ESCP. Pedestrian access around the compound will be maintained at all times. No tree trimming or removal will be carried out within the compound sites.	Approvals documentation	Lipman Project Manager PM Project Engineer PE	Compound Location

Safeguards	Safeguard	Persons responsible	Evidence of action
Identify underground and above ground services in the vicinity of the works by undertaking a dial before you dig request, consulting with utility companies that have services within close proximity; and identifying services locations using a specialised contractor and potholing prior to undertaking ground disturbance.	All Prior to permit	PE	Utility survey
Fencing is to be placed around the whole of each construction compound site and will include signage detailing Project contact details should there be any enquiries by the public.	Prior to works	PM/PE.ESR	Condition of Lease
Construction works will not commence until the Site Access Approval (in writing) has been obtained from Parramatta Council	Approvals	PM/PE.ESR	Condition of Lease
During Works			
Existing access for nearby and adjoining properties is to be maintained at all times during the works unless otherwise agreed to by the affected property owner.	Plans All	PE	Environmental inspection checklist
Consideration will be given to reducing the temporary visual amenity impacts associated with the establishment of the site offices. This may include the choice of materials and finishes that are complementary to the surrounding visual landscape and existing structures. Any landscaping provided will complement the existing local character and streetscape and will be delivered in accordance with the Landscape Guideline / Plan.	Landscaping Planning	PE/ ER	Inspection Checklist
The following controls will be put in place at the site compounds: • Appropriate erosion and sediment controls, e.g. perimeter silt fences • Site fencing • Stabilised site access • Truck wash down area • Designated material laydown areas • Bins for waste disposal and to promote recycling • Plumbed in ablution facilities • Self-bunded chemical storage container • General house keeping • Installation of designated parking areas, no parking permitted in other areas Controls are inspected weekly and within 24 hrs of more than 20 mm rain.	SWMP	PE/ ESR / S	Environment Inspection Checklist ESCP
Any portable lighting will be positioned and directed away from receivers to avoid light spill causing impacts to road users and adjacent or nearby private property.	Supervision Planning	PE	Environment Inspection Checklist
Post-works			
A post-construction land condition assessment to verify that no unauthorised project wastes remain on land to be returned, will be prepared and provided to the Client.	Approval Documentation	PE	Post-construction land condition assessment report

3.16 Traffic and Pedestrian Transport

A Traffic Management Plan (TPMP) prepared as part of the CEMP. This document is located in Appendix C2 (j) and is the master document for all traffic and pedestrian management and controls.

3.17 Restoration of site

The following control measures will be implemented to ensure safeguards are in place

Safeguards	Safeguard	Persons responsible	Evidence of action
During works			
Remove all construction sediment retention basins and sediment traps before Completion, but not before all upstream areas have been vegetated or otherwise stabilised in accordance with BLUE BOOK. As part of the restoration works, ensure appropriate removal and disposal/reuse of sediment (including potentially contaminated sediment).	SWMP	PE/ ESR	Inspection checklist
Temporary stabilisation works will be introduced during the excavation and construction works, including details contained in the SWMP. Temporary stabilisation, in accordance with the SWMP, will be put in place for exposed soils and proposed landscaping areas during construction. Areas will commence progressive rehabilitation once works are completed in each area. Rehabilitation and landscaping works may include: • Demobilisation • Removal of environmental controls • Removal of construction equipment • Landscaping	SWMP Landscaping	PM/ ESR	Visual Inspection
Landscaping would be provided around the designed Landscape areas	Design	PE/ ESR	Landscaping Plan
The worksite will be left tidy and free of rubbish at the end of each workday.	WMP	PE/ ESR	Visual Inspection
Post-works			
The assessment concludes that all areas will be restored to a similar condition, but not the same, due to the extent of the works to construction community recreational facilities. On completion of the works, all areas disturbed by construction activities (including the site compound, materials storage, internal access routes) will be restored to conditions similar to the original condition. All waste will be removed upon completion of the project.		PM/ ESR	Visual Inspection

4 Surveillance and Audits

The Client may conduct regular surveillance and inspections of the Site at any time. Where site inspections are carried out, the Client will contact the Lipman Project Manager in all instances at the time of, or prior to, entering the Site and follow the relevant induction procedures outlined in Section 2.5.1.

The Client may conduct a CEMP compliance audit at 24 hours' notice to Lipman, if surveillance, inspections or audits indicate that the environmental controls are not in place or are not properly maintained as required by this CEMP. In all other instances, the Client will give Lipman at least 5 days' notice that a CEMP compliance audit is to be conducted and will advise on the scope of the audit.

Where inspections of the site by the Client are requested, the Lipman Project Manager, and Environmental Site Representative will be available and provide necessary resources, including site personnel and facilities at the site to accommodate the audit team nominated by the Client.

Any issues raised in audits by the Client during these inspections will be responded to in writing within 7 working days. Any response will clearly outline how issues will be addressed and the agreed timeframes for closing out any non-conformances or areas for improvement.

Appendix A1 – Relevant Legislation Compliance Tracking

Relevant Legislation - Compliance Tracking Matrix			
This table should be reviewed regularly to reflect current legislation and the legislative requirements specific to the project			
Act	**Aspect**	**Requirement**	
General			
Environmental Planning and Assessment Act, 1979	All	Comply with the terms of the Review of Environmental Factors for the project. Obtain approval for any project modifications that are not consistent with the planning approval	
	All	To examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.	
Protection of the Environment Operations Act 1997	Site licensing	Do not carry out or allow an activity listed in Schedule 1, or carry out work to enable such an activity, unless the premises are licensed by the EPA.	
Land Acquisition (Just Terms Compensation) Act 1991	Property acquisition	Applies to the acquisition of any land required for the project.	
Roads Act 1993	N/A	Prior to construction, a notice must be placed in the local newspaper allowing for any submissions to be made by any person.	
Pollution			
Protection of the Environment Operations Act 1997	Harming the environment	Do not risk harming the environment by wilfully or negligently: • disposing of waste unlawfully. • causing any substance to leak, spill or otherwise escape (whether or not from a container); or • emitting an ozone depleting substance	
	Control equipment	Properly and efficiently maintain and operate any installed pollution control equipment (including monitoring devices).	
	Notification of pollution incidents	Notify the EPA immediately of pollution incidents where material harm to the environment is caused or threatened.	

Water			
Water Management Act 2000	Water access and use.	Do not take water from a water source (a lake, river or estuary or place where water occurs naturally on or below the surface of the ground and includes coastal waters) without an access licence. Do not use of water on land (unless supplied by a water utility, irrigation corporation etc. or in accordance with basic landholder rights) without a water use approval.	
	Water management works	Do not construct/use a water supply work, drainage work or flood work without the appropriate approval.	
	Waterfront land	Do not deposit material, excavate, or remove material within a watercourse bank, shore or bed, or on land 40 metres inland, or interfere with the likely flow of water to such a body, without a controlled activity approval.	
Water Act 1912	Surface water	Obtain a licence or permit for construction or use of 'work' for purposes including the taking and using of water	
	Groundwater	Obtain a licence where interference with groundwater is likely to occur. TfNSW being a department of NSW government and as defined within the Water Act 1912 as the Crown is exempt from the provision of obtaining a licence.	
	Floodplains	Obtain an approval for controlled works. These include works which occur on a designated floodplain, which can prevent land from being flooded or which can affect water flow to or from a river or lake.	
	Water pollution	Do not cause water pollution (other than to a sewer), except in accordance with the conditions of any EPA licence.	
Noise			
Protection of the Environment Operations Act 1997	Plant maintenance and operation	Do not operate plant if it emits noise caused by poor maintenance or operation.	
	Materials management	Do not cause noise by failing to properly and efficiently deal with materials.	
Contaminated material			
Protection of the Environment Operations Act 1997	Land pollution	Do not cause or permit land pollution other than under authority of a licence or regulation. (However it is not a land pollution offence to place virgin excavated natural material or lawful pesticides and fertilisers on land, or by placing matter on land that has been notified to the EPA as an unlicensed landfill and which is operated in accordance with the regulations.)	

Contaminated Land Management Act 1997	Reporting contamination	Notify the EPA if: • Contaminants exceed thresholds contained in guidelines or the regulations where contamination has entered or will foreseeably enter neighbouring land, the atmosphere, groundwater or surface water. • Contaminants in soil are equal to or exceed guideline levels with respect to the current or approved use of the land. • Contamination meets other criteria that may be prescribed by the regulations.	
Remediation action plan, Urbnsurf Sydney Wave Park Group PRM Supplementary Remediation action plan	Remediation action planning	• Implementation of the site specific RAP and supplementary RAP and CEMP and all subplans in order to demonstrate compliance with the development consent and legislative provisions. • Achieving the remediation criteria and validation of the remediation strategy based on requirements of the RAP; — the visual confirmation of marker layer and, where required, clean fill capping material — analytical results for any material imported to the site to construct the cap — survey data confirming the cap thickness — analytical results for material intended for reuse — material tracking for any soil removed from the site. • A report shall be prepared following successful remediation and validation of the site and shall include the recommendations for preparation of a long-term EMP	
Biodiversity			
Biosecurity Act 2015	Weed control	Duty to prevent, eliminate or minimise any biosecurity risks encountered. Consult local council weeds officer and NSW Weedwise website for disposal and control of weeds. Notify local council weeds officer within one working day of any high priority weeds	
National Parks and Wildlife Act 1974	Native fauna	Do not harm any animal that is of a threatened species population or ecological community, or its habitat except in accordance with a planning approval. Do not harm critical habitat except as in accordance with a planning approval. Do not harm native fauna (other than listed unprotected fauna) except in accordance with a planning approval or licence.	
	Flora and native vegetation conservation	Do not pick protected native plants without a licence	
Biodiversity Conservation Act 2016	Biodiversity Conservation	Do not cause a significant impact to listed threatened species, populations or ecological communities, or their habitats.	

Fisheries Management Act 1994	Dredging or reclamation	A permit to authorise dredging or reclamation work must be obtained from the Minister	
	Mangroves, seagrasses and marine vegetation	Do not harm any mangroves, seagrasses or other marine vegetation on public water land protected by the regulations without a permit	
	Fish passage	Do not block fish passage without a permit	
Environment Protection Biodiversity Conservation Act, 1999(Commonwealth)	Flora and fauna conservation	Do not undertake an action that will or is likely to have a significant impact on a listed threatened species or threatened ecological community Do not undertake an action that will or is likely to have a significant impact on the environment on Commonwealth land	
	Compliance	Do not take any action to contravene any conditions of approval attached to the project approval	
Waste			
Protection of the Environment Operations Act 1997	Littering	Do not litter in a public place or an open private place. Do not litter from a vehicle. Only deposit advertising material in receptacles provided for mail or newspapers or under the door of the premises. Do not deposit advertising material on or in vehicles.	
	Waste and transportation	Do not undertake a scheduled waste activity unless in accordance with an environmental protection licence. A licence must be obtained when construction and demolition wastes are applied to land under certain circumstances. This includes there incorporation of crushed road base material back into roads and the placing of excess fill material onto properties. A licence is not required if the material: • Is VENM. • Does not exceed 200 tonnes in the Sydney, Newcastle and Wollongong areas, or 20,000 tonnes outside these areas. • Is covered by a “general exemption”. Current exempted materials are ENM, recycled aggregates and raw mulch. These exemptions are conditional and require some chemical testing of materials before they are placed onto land. Only transport waste to a facility that can lawfully accept the waste. Do not dispose of waste in a manner that harms or is likely to harm the environment.	

Protection of the Environment Operations (Waste) Regulation 2005	Waste and transportation	Comply with general requirements for the transport of waste. For example, any vehicle used by the person to transport waste must be kept in a clean condition and be maintained so as to prevent spillage of waste. For some wastes, only licensed transporters can be used. Comply with record keeping requirements in relation to the transport of certain types of waste.	
Heritage			
Environment Protection Biodiversity Conservation Act,1999 (Commonwealth)	National heritage	Do not take an action that will or is likely to have a significant impact on the National Heritage values of a National Heritage place Do not undertake an action that will or is likely to have a significant impact on the environment on Commonwealth land	
	Compliance	Do not take any action to contravene any conditions of approval attached to the project approval	
Heritage Act 1977	Heritage	Do not undertake an activity that will affect a place, building, work, relic, moveable object or precinct which is subject to an Interim Heritage Order or is listed on the State Heritage Register without approval from the Heritage Council. Do not disturb or excavate land with knowledge or reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed; or do not disturb or excavate land on where a relic has been discovered or exposed. Notify the heritage Council on discovery of a relic	
National Parks and Wildlife Act 1974	Aboriginal consultation	Consult with Aboriginal parties on the methodology and draft cultural heritage assessment report	
Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth)	Protection of areas and objects	Report any discovery of Aboriginal remains to the Federal Minister for the Environment and Heritage. Comply with the provisions of any declaration in relation to a significant Aboriginal area or object	
Hazards and risks			
Environmentally Hazardous Chemicals Act, 1985	Hazards and risks	Obtain a licence to undertake prescribed activities involving environmentally hazardous chemicals or declared chemical wastes.	
Dangerous Goods (Road and Rail Transport) Act 2008	Hazards and risks	Ensure that dangerous goods are transported in a safe manner.	

Pesticides Act 1999	Hazards and risks	Use pesticides in an environmentally sensitive manner. Do not use an unregistered pesticide without a permit. Read the label or permit for the pesticide. Use registered pesticides in accordance with instructions on the label. Do not use any restricted pesticide unless authorised by a certificate of competency or a pesticide control order under the Act. Compliance with pesticide codes of practice is required.	
Greenhouse gas emissions			
National Greenhouse and Energy Reporting Act, 2007 and Regulations2008	Greenhouse gas emissions	Accounting and reporting of greenhouse gases produced and energy consumed during construction. Applicability dependent on thresholds.	

Appendix A2 – Safeguards Tracking

Relevant REF safeguards			
Safeguard	**Requirement**	**Reference**	**How addressed**
EIS	A CEMP will be prepared and submitted for review and endorsement of Department of Planning prior to commencement of the activity. As a minimum, the CEMP will address the following: • any requirements associated with statutory approvals • details of how the project will implement the identified safeguards • issue-specific environmental management plans • roles and responsibilities • communication requirements • induction and training requirements • procedures for monitoring and evaluating environmental performance, and for corrective action • reporting requirements and record-keeping	All	This CEMP - prepared for URBNSURF (Developments) Sydney Pty Ltd endorsement to address the environmental requirements for the Project

Relevant REF safeguards			
	• procedures for emergency and incident management • procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.		
GEN2	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings. Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include: • adjoining residential areas requiring particular noise management measures.	All	Site induction procedures for all workers and visitors to site
TRA1	The TPMP will be prepared in accordance with the Roads and Maritime Traffic Control at Work Sites Manual (RTA, 2010) and QA Control of Traffic (Roads and Maritime, 2008). The TMP will include: • confirmation of haulage routes • construction vehicle parking controls and provision for worker parking off-street and on-site • measures to maintain access to local roads and properties • site specific traffic control measures (including signage) to manage and regulate traffic movement • measures to maintain pedestrian and cyclist access • requirements and methods to consult and inform the local community of impacts on the local road network • a requirement to consult with those affected by changes to private driveway access • description of the access routes to construction sites including the entry and exit locations and measures to prevent construction vehicles queuing on public roads • a response plan for any construction traffic incident • consideration of other developments that maybe under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic	Appendix C2 (j) - TPMP	The TPMP accompanies this CEMP and addresses traffic and transport impacts as well as Pedestrians

Relevant REF safeguards			
	• monitoring, review and amendment mechanisms.		
TRA2	Notification of the local community and recreational facility users on construction progress including scheduling of works.		Community notification procedures, letter drop, signage
TRA3	The appropriate road opening and occupation permits will be sought from Bayside Council, accompanied by detailed traffic management plans prior to the works commencing. Any Road Occupancy Licences from the Transport Management Centre for work on State roads will also be obtained, where required.		PM to obtain licence to occupy and site access
TRA4	Green travel concessions would be promoted through the club membership to encourage non-car-based travel to the sites.	Appendix C2 (j) TPMP	Mitigation measures included in TMP recommend alternative transport methods to reduce traffic impacts
NOI1	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared and implemented as part of the CEMP. The CNVMP will generally follow the approach in the ICNG and identify: all potential significant noise and vibration generating activities associated with the activity; and feasible and reasonable mitigation measures to be implemented. The measures will be consistent with the Roads and Maritime Construction Noise and Vibration Guideline. The CNVMP will include a monitoring program to assess performance against relevant noise and vibration criteria. Arrangements for consultation with key stakeholders and sensitive receivers, including notification and complaint handling procedures and contingency measures will be implemented in the event of non-compliance with noise and vibration criteria.	Appendix C2 (k) - NVMP	The NVMP accompanies this CEMP and addresses noise and vibration impacts and includes measures to manage these.
NOI2	Advanced notification of work and potential disruptions would be provided where receivers are likely to experience annoyance from noisy work. The notification may consist of a letterbox drop (or equivalent) detailing work activities, time periods over which these would occur, impacts and mitigation measures. Notification distribution will be a minimum of five business days prior to the start of work.	Appendix C2 (k) - NVMP	Mitigation measures included in NVMP include requirements for letterbox drops 5 days prior to noisy works and impacts on access

Relevant REF safeguards			
NOI3	Respite offers will be considered where there are high noise and vibration generating activities near residential receivers. The respite would be a minimum period of one hour between blocks of continuous work which would be limited to three hours in duration. The actual duration of each block of work and respite should be flexible to accommodate the requirements of impacted receivers.	Appendix C2 (j) - NVMP	Mitigation measures included in the NVMP consider the use of respite periods
NOI4	Out of hours works would be undertaken over no more than two consecutive nights.	Appendix C2 (j)– NVMP	Mitigation measures included in the NVMP detail limits on OOHW.
NOI5	Where feasible and reasonable, construction will be carried out during standard daytime construction working hours. Works generating high noise and/or vibration levels will be scheduled during less sensitive time periods.	Appendix C2 (j) – NVMP 2.6 of this CEMP	Mitigation measures included in NVMP detail construction hours, and limiting noisy works during sensitive time periods Working hours are detailed in Section 2.6 of this CEMP.
VIS1	Consideration would be given to reducing visual amenity impacts associated with new structures during detailed design, for example in the choice of materials and finishes that are complementary to the surrounding visual landscape.	Detailed Design	Considered during detailed design. Project is construct only.
VIS2	Measures to further minimise the construction footprint and to increase vegetation retention areas will be investigated during detailed design.	Appendix C2 (p) – FFMP	Mitigation measures included in FFMP detail measures to increase vegetation retention areas.
VIS3	A site inspection by a qualified arborist would be undertaken prior to commencing construction to confirm tree removal, tree retention and tree protection measures. The implementation of site-specific safeguard measures will be checked before construction starts.	Appendix C2 (p) – FFMP	Mitigation measures included in FFMP detail pre-clearing survey requirements
LIG1	Lighting provided for the proposal would be designed to comply with Australian Standard (AS) 4282 – Control of the obtrusive effects of outdoor lighting and AS 2560:2007 Sports Lighting.	Detailed Design	Considered during detailed design. Project is construct only.

Relevant REF safeguards			
LIG2	Full cut-off fixtures would be used for lighting where feasible	Detailed Design	Considered during detailed design and will be further detailed for operational management. Project is construct only.
LIG3	Lighting would be operated at no more than 200 Lux	Detailed Design	Considered during detailed design and will be further detailed for operational management. Project is construct only.
LIG4	Residents potentially affected by increased light spill would be consulted prior to construction.	Communications Plan	Consultation regarding the project impacts during construction would be undertaken in accordance with the Communications Plan
LIG5	Any portable lighting will be positioned in a manner to have light directed away from adjoining receivers, including road users, and will avoid adverse impacts to individual private property.	3.18 of this CEMP	Included as mitigation measure. Will be checked during site inspections
BIO1	A Flora and Fauna Management Plan will be prepared in accordance with Biodiversity Guidelines: It will include, but not be limited to: • plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • requirements set out in the Landscape Guideline • pre-clearing survey requirements • procedures for unexpected threatened species finds and fauna handling • requirement for a suitably qualified arborist to be present for on-site for activities such as tree health assessments, when tree roots are encountered and during vegetation clearing • protocols for manage weeds and pathogens.	Appendix C2 (p) – FFMP	Mitigation and management measures included in FFMP have been prepared in accordance with the Biodiversity Guidelines, and are included as an Appendix to the FFMP.
BIO3	Measures to further minimise the construction footprint and increase vegetation areas will be investigated during detailed design and implemented where practicable and feasible.	Appendix C2 (p) – FFMP	Mitigation measures included in FFMP detail measures to increase vegetation retention areas.

Relevant REF safeguards			
BIO5	Measures to further manage any unexpected finds of Green and Golden Bell Frog to be incorporated into the Flora and Fauna Management Plan are as follows: • Site inductions will contain a relevant section on identifying and managing potential risks to the Green and Golden Bell Frog. This will include identification of the frog and its habitat, and frog hygiene protocols • Fencing to maintain Golden Bell Frogs outside the construction zones Any Green and Golden Bell Frogs encountered within the construction footprint during construction are to be collected by a qualified and experienced herpetologist and relocated to a suitable nearby location by the herpetologist.	Appendix C2 (p) – FFMP	Mitigation measures included in FFMP include requirements for a herpetologist to relocate any unexpected finds of Green and Golden Bell frogs and informing the workforce of the potential of encountering the frogs onsite.
FLO1	A Construction Soil and Water Management Plan (CSWMP) will be prepared and implemented as part of the CEMP. The CSWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction. Measures that would be implemented as part of the CSWMP will include: • Erosion and sedimentation controls will be checked and maintained on a regular basis (including clearing of sediment from behind barrier) and records kept and provided on request • Erosion and sediment control measures will not be removed until the works are completed and areas are stabilised work areas will be stabilised progressively during the works.	Appendix C2 (g) - SWMP	The SWMP accompanies this CEMP and addresses soil and water impacts and includes measures to manage these during construction.
FLO2	A site-specific Erosion and Sediment Control Plan (ESCP) will be prepared and implemented as part of the CSWMP. The ESCP will include arrangements for managing wet weather events, including monitoring of potential high-risk events (such as	Appendix C2 (g) - SWMP	An ESCP is included as an appendix to the SWMP. Measures in the SWMP include management requirements for erosion and sediment control.

Relevant REF safeguards			
	storms) and specific controls and follow-up measures to be applied in the event of wet weather. Erosion and sediment control measures will be implemented and maintained and will include: • The maintenance of established stockpile sites • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces • Divert clean water around the site.		
FLO3	On-site retention or detention strategies will be implemented to manage permissible site discharge and reduce flood risk where the impervious construction constitutes an impermeable surface and triggers the need for detention.	Appendix C2 (g) - SWMP Detailed Design	Mitigation measures included in the SWMP and FMP detail soil, water and flood management strategies. On-site detention structures and volumes will be addressed as part of the detailed design.
FLO4	Stormwater quality management measures will be implemented to achieve stormwater pollution reduction targets. These measures will include: • Prohibition of release of dirty water into drainage lines and/or waterways • Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) will be undertaken on a regular basis to identify any potential spills or erosion and sediment controls. Water quality control measures will be implemented to prevent any construction materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways.	Appendix C 2 (g)- SWMP	Mitigation measures included in the SWMP detail runoff containment and water quality monitoring requirements

Relevant REF safeguards			
	Due to the proximity of site to the main discharge pit into the wetlands, daily review of sediment controls will be put in place and weekly reports sent to SOPA.		
FLO5	Weather conditions will be monitored to identify potential flood conditions and manage potential flooding impacts in accordance with the CEMP.	Appendix C 2 (g) SWMP	Mitigation measures included in the SWMP detail weather monitoring requirements to identify potential flood conditions
CON1	Erosion and sedimentation control measures will be outlined in an ESCP and implemented for the proposed works.	Appendix C 2 (g) SWMP	An ESCP is included as an appendix to the SWMP
CON2	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the EPA.	Appendix C 2 (g) - SWMP	Mitigation measures included in the SWMP detail contamination requirements to manage impacts during construction
CON3	If asbestos is identified during excavation, the material will be managed as Special Waste (containing asbestos) and disposed of an appropriately licenced waste facility.	Appendix C 2 (n)– AMP	Mitigation measures included in the Asbestos Management Plan will detail requirements for the management and disposal of any asbestos encountered onsite.
CON4	A site-specific emergency spill plan will be developed, which will include spill management measures in accordance with relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including EPA officers).	Appendix B11	The SSESP accompanies this CEMP and includes spill containment measures to manage impacts during construction. A spill response procedure is included as an appendix to the SSESP
AIR1	Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust.	Appendix C2 (l) - SWMP	Mitigation measures included in the SWMP and in 3.4 of this CEMP detail measures to control dust
AIR2	Loads containing loose materials are required to be covered.	3.4 of this CEMP	Included as mitigation measure. To be checked during site inspections

Relevant REF safeguards			
AIR3	On-site vehicle speed limits are to be established and enforced.	3.4 of this CEMP	Included as mitigation measure. To be checked during site inspections
AIR4	Dust minimisation measures for exposed stockpiles (such as top soil stockpiles) and unsealed construction areas are to be implemented as required (such as water spraying).	3.4 of this CEMP	Mitigation measures included in 3.4 of this CEMP include measures to control and suppress dust.
AIR5	Vehicles and machinery are to be regularly serviced and maintained in an efficient condition to minimise potential emissions.	3.4 of this CEMP	Included as mitigation measure. To be checked during site inspections
AIR6	During extreme weather events where dust generation cannot be effectively minimised (such as high winds), dust generating works would cease until adequate controls can be implemented or until adverse weather conditions subside.	Appendix C 2 (l)- SWMP 3.4 of this CEMP	Mitigation measures included in the SWMP and in 3.4 of this CEMP include measures to monitor dust and stop works in windy conditions that may result in dust emissions
AIR7	Exposed areas are to be stabilised with planting as soon as reasonable and feasible where planting is specified and landscaping design is proposed.	3.4 and 3.18 of this CEMP	Mitigation measures included in the SWMP, 3.4 and 3.18 of this CEMP include measures to stabilise disturbed areas
AIR8	Stockpiled material is to be appropriately shaped to reduce wind erosion and covered/seeded/sealed if are to remain in-situ for more than 48hrs.	Appendix B9 - SMSP 3.4 of this CEMP	Mitigation measures included in the SMSP and 3.4 of this CEMP include measures to shape and cover stockpiles
AIR9	Vehicles and activities are to be confined to the designated work areas to prevent any inadvertent encroachment into exposed areas.	3.4 of this CEMP	Included as mitigation measure. To be checked during site inspections
AIR10	All emission controls used on vehicles and construction equipment would comply with standards listed in Schedule 4 of the Protection of the Environment Operations (Clean Air) Regulation2010.	3.4 of this CEMP	Included as mitigation measure. To be checked during site inspections
AIR11	Vegetation or other materials are not to be burnt on site.	3.4 and 3.5 of this CEMP	Mitigation measures included in the FFMP, 3.4 and 3.5 of this CEMP include measures to prohibit fires onsite

Relevant REF safeguards			
LAN1	A Community Consultation Plan (CCP) will be prepared and implemented as part of the CEMP to help provide timely and accurate information to the community during construction. The CCP will include (as a minimum): • mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions • contact name and number for complaints. The CCP will be prepared in accordance with NSW communications guidelines, standards and e-tool kit.	2.7 of this CEMP	Complaints register and detailed notification and complaints management procedures
COW1	A Waste Management Plan (WMP) will be prepared as part of the CEMP in accordance with the Roads and Maritime Services Technical Guide: Management of road construction and maintenance waste.	Appendix C 2 (m) - WMP	The WRMP accompanies this CEMP and includes waste management measures to manage impacts during construction.
COW2	The following resource management hierarchy principles will be followed: • Avoid unnecessary resource consumption as a priority • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery where possible) • Disposal is undertaken as a last resort.	Appendix C 2 (m) - WMP	Measures included in the WMP detail resource management hierarchy principles
COW3	If vegetation is to be mulched and transported off site for beneficial reuse, a Mulch Management Plan will be prepared, and mulch will be assessed for the presence of weeds, pests, and other diseases.	Appendix C 2 (m) - WMP	Mitigation measures included in the WMP detail measures for mulch management, including the preparation of a mulch management plan if mulch is intended for offsite reuse
COW4	Excavated material, soil, fill and other erodible matter that are transported to or from the sites will be kept covered at all times during transportation.	Appendix C 2 (m) - WMP	Mitigation measures included in the WMP detail requirements to cover loads during transportation

Relevant REF safeguards			
COW5	All excess spoil generated from excavations classified as General Solid Waste (putrescible) will be disposed of at a licensed facility.	Appendix C 2 (m) - WMP	Mitigation measures included in the WMP detail waste classification and disposal requirements
COW6	All waste will be classified in accordance with the Waste Classification Guidelines (EPA, 2014) so that different waste streams will be kept separate.	Appendix C 2 (m) - WMP	Mitigation measures included in the WMP detail waste classification requirements and relevant extracts from the waste classification guidelines
COW7	All general inert and solid waste material will be stored at designated points, isolated from surface water and stormwater drains.	Appendix C 2 (m) - WMP	Mitigation measures included in the SWMP and WRMP detail waste storage and stockpiling requirements to limit erosion and cross contamination
COW8	Wastes disposed offsite will be sent to a facility appropriately licenced to receive that waste.	Appendix C 2 (m) - WMP	Mitigation measures included in the WMP detail waste disposal requirements to licenced facilities
COW9	Compilation of a waste data form for recording waste movement including; solid and inert waste materials, provision of a description of the waste types, physical nature of wastes, proposed treatment, dates of movement, transporters and waste destination details.	Appendix C 2 (m) - WMP	Mitigation measures included in the WMP detail requirements for maintaining waste records. A waste register is included as an appendix to the WMP
UTI1	Identify all underground and above ground services in the vicinity of the proposal by undertaking a dial before you dig request, consulting with utility companies that have services within close proximity to the proposal; identifying services locations using a specialised contractor and potholing prior to undertaking ground disturbance.	3.16 of this CEMP	Utility investigation forms part of the scope of works.

Appendix A3 – Aspects and Impacts Risk Register

Activity (Aspect)	Risk (Impact)	Controls	Risk Rating
Tree Protection and Removal	• Damage or unauthorised removal of protected trees, plants and/or vegetation marked for retention • Damage or loss to fauna or fauna habitat	• Clearly define boundaries and areas to be cleared on drawings and communicate to all project personnel/workforce • Physically identify plants and locations by way of visible markers (e.g. ribbons, fencing, signage) to remain undisturbed • Ensure SWMS for Clearing and Grubbing and associated methodology complies with the Biodiversity Guidelines • Qualified Fauna spotter / catcher to be engaged during vegetation clearing works	High
Excavation of Soils/ Hazardous Materials	• Worker exposure to contaminated soil • Extent of contamination and quantification of the contaminants • Material suitability for reuse on site suitability for reuse on site • Reuse of unsuitable / contaminated material during construction	• Site investigation works to be undertaken for potential contaminated soils • Worker health monitoring (refer WHSMP) if necessary, for works involving removal or treatment of contaminated material • Approved, licenced contractors to be used • SWMS for removal of contaminated soil • Remediation Action Plan to be implemented • Soil contamination management sub plan to be implemented. • Stockpiles naming / numbering system to be developed and managed through stockpile management sub plan	High
	• Risk to workers, public and surrounding properties	• Worker health monitoring (refer WHSMP) if necessary, for works involving removal or treatment of contaminated/ hazardous material • Review location of proposed stockpile locations to ensure adequate distance to site boundary areas and heavily used work areas • Implement controls in Soil contamination management sub plan and Remediation Action Plan to limit potential exposure • Install fencing/barricading and signage, creating an exclusion zone	Medium
Offsite Disposal of Waste and Contaminated Materials	• Contaminated spoil influencing nearby drainage and creek lines • Improper/ illegal disposal	• Indicative waste classification of earthworks material prior to works commencing • Stockpile sampling to ascertain material classifications prior to reuse or disposal on/off site • Stockpile of contaminated or potential contaminated spoil away from drainage course. Covered with geofabric or plastic and clearly identify using stockpile management system • Delineation and separation of contaminated and clean fill stockpiles. • Engage reputable contractors to dispose of fill, request environmental and development approvals for waste accepting facility prior to material leaving site.	High

Activity (Aspect)	Risk (Impact)	Controls	Risk Rating
		• Daily submission and review of disposal documentation, waste tracking to be undertaken in waste tracking register.	
Excavation disturbing Asbestos Material	• Potential asbestos located and/or disturbed	• SWMS to identify any works related to clearing, grubbing, excavation or disturbance of insitu materials or assets • Licenced and authorised asbestos contractor manage the removal and disposal of asbestos contaminated waste • Give notice to SafeWork NSW of the Intention to Remove Asbestos at least five (5) calendar days before undertaking any licenced asbestos removal work • Develop an Asbestos Removal and Control Sub-plan • Review the contamination assessment report provided for information purposes.	High
Demolition	• Workers or the public exposed / injured due to debris, sand or contaminated materials	• Licenced and experienced demolition contractor to be used • Implement exclusion zones, inclusive of fencing, barricading and signage • Monitor Noise and Vibration during demolition works, implement controls as required. • Consult with local sensitive receivers prior to undertaking works which may affect them.	High
General construction activities	• Water polluted due to factors such as run-off of construction materials, contaminated land and/or chemicals/substances • Exposed soils during earthworks activities • Potential for interaction with Groundwater • Potential acidic leachate due to interaction with Acid Sulphate soils	• Ensure all plant and equipment is appropriately maintained • Install adequate barriers, sediment and erosion controls • Clean and Dirty water temporary drainage systems to be constructed prior to undertaking construction works. Design drainage to contain site to limit the release of sediment and runoff offsite and maximise dirty water captured and treated within temporary sediment basins. • Specific ESCP to be developed and measures to be adhered to. Erosion control structures to be designed appropriately. Sediment basins to be adequately sized and maintained. Silt fences and other controls to be inspected and maintained regularly. • Acid Sulphate Soils Management plan to be developed following site investigations • Contaminated soils management plan to be developed following site investigation.	High
	• Dust, noise and vibration impacts resulting in complaints or harm	• All loads to be covered • Works to be undertaken within approved operating hours only, unless otherwise approved • Noise attenuation equipment to be fitted to fixed and mobile plant as required • Water trucks to be utilised to wet down areas where dust is a high risk, • Consideration to use of road sweeper at site entrances, if required, to reduce mud tracking and dust impacts.	Medium

Lipman Project Risk Assessment (added for additional reference)

PROJECT RISK ASSESSMENT

LIPMAN

PROJECT:	URBN SURF
PERSONS CONSULTED:	Cameron Bowden, Cameron MacArthur
REVIEWED BY:	Name: Cameron MacArthur Title: General Foreman Date: 05/05/2022
APPROVED BY:	Name: Cameron Bowden Title: Site Manager Date: 05.05.2022

RISK CLASS	Consequence		
Likelihood	Major	Moderate	Minor
Likely	1	1	2
Possible	1	2	3
Unlikely	2	3	3

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
			As applicable, the following controls shall be implemented in addition to the specific controls stated for the hazards/activities identified in the risk assessment below. - Establish, implement and maintain Project Plan in accordance with ISO 14001 and ISO 45001. - Establish, implement and maintain Management Systems procedures in accordance with ISO 14001, ISO 45001 and Federal Safety Commissioner' WHS Accreditation Scheme Criteria. - State WHS Act and Regulations. - Conduct site inspections to monitor effectiveness of control and action findings as per Project Plan. - Comply with Development Application/Consent Requirements	
Accessing Site Access for emergency vehicles, Parking in unsafe and illegal areas, Access for visitors, delivery drivers and workers.	1. No access for emergency vehicles or access obstructed.	1	1. Establish emergency and evacuation system (Refer Dealing with Emergencies section below).	2
	2. Lack of safe parking facilities on site.	1	2. Use public transport, park in authorized areas or parking stations.	2
	3. Persons accessing site are unaware of site conditions, hazards or rules.	1	3. Establish Site Incuction containing site rules. Induct all workers. Communicate site rules to visitors accessing construction site. Supervise delivery drivers accessing designated material handling area only. Record attendance for visitors accessing site office only.	2
	4. Access to site office is unclear and may result in persons walking onto site.	1	4. Sign post entry areas and fence off site to public and monitor condition. Place signage around site (PPE, directions, etc).	2
Establishing Site E.g. Establish fences, sheds, power, water, sewer, etc.	1. Injury caused by handling/moving materials around site.	1	1. Plan for and assign suitable area for storage and movement of materials. Use mechanical means where possible (e.g. crane, forklift, material hoists, trolley etc.). Provide training for employees required to operate plant. Implement SWMS for working with or near powered mobile plant.	2
	2. Public entering site during or after hours.	1	2. Provide perimeter fencing and signage for the site. Lock gates after work or when site is not occupied.	2
	3. Inadequate Lighting (Emergency, Access specific, Task specific).	1	3. Provide general and emergency lighting.	2
	4. Isolations to existing services not carried out leading to injury.	1	4. Engage electrician to confirm circuits are protected, wiring is labelled, and isolations are in place before excavation and or demolition. Dial before you dig 1100. Positively locate above and in ground services using non-destructive and vacuum pot holing methods. Obtain relevant work permits prior to work. Implement	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
			SWMS for working with electricity. 5. Electrical Contractors are to comply with State "Certificate of Compliance for Electrical Work" (NSW-CCEW)" or "Certificate of Testing and Compliance" (QLD) requirements including system verification (inspection & testing), recording of test values and notification to all required parties.	
COVID-19 Assessment, communication, isolation/social distancing, travel, operational/contractual/financial impacts, IT systems	1. People worried about the risks leading to additional absences (e.g. self-quarantine), stress and anxiety	2	1. Implement COVID-19 Response Guide (Procedure 50.2) Communicate information about the coronavirus and good hygiene practices to employees and subcontractors (Newsflash, Intranet, posters, toolbox/prestart talks, etc.). Provide EAP services to employees and their family through Acacia Connect. Employees to seek medical advise if symptoms develop. Persons considered at higher risk categories through age, underlying medical conditions, or compromised health should seek medical advice. Persons who are unwell must not come to work. Implement "Social Distancing" measures with all people in accordance with government guidelines.	3
	2. Not identifying and isolating confirmed and/or high risk cases of infection	1	2. Implement COVID-19 Response Guide (Procedure 50.2) Fully vaccinated workers returning from any overseas country are to get a Rapid Antigen Test (RAT) completed within 24 hours of arrival and can stop self-isolating once they receive a negative result from this test. Another RAT must be completed on or after Day 6 of arrival. Workers not fully vaccinated must go into 7 day mandatory quarantine. Identify affected persons directly from employers, employee/person or through public health authorities. Communicate COVID-19 site rules to project team members through site inductions and site meetings. Employer to advise persons who are known to/may have been in close contact with confirmed cases of the infection if known. Persons in close contact with a confirmed case (i.e. household member) to get RAT or PCR test and self-isolation as per	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
			government guidelines.	
	3. Absences and leave from work due to sickness (self/family/quarantine/close contact with known case)	2	3. Employees to arrange leave in accordance with leave policies or flexible working arrangements. Provide EAP services to employees and their family through Acacia Connect. Implement COVID-19 Response Guide (Procedure 50.2).	3
	4. Disease spreading at work	2	4. Implement COVID-19 Response Guide (Procedure 50.2 Communicate COVID-19 site rules in line with health department guidelines, public health orders, and restrictions to project team members through site inductions, site meetings electronic communications, notice board, toolbox talks. Practice good hygiene practices. (wash hands often, covering coughs/sneezing), Implement "Social Distancing" measures with all people in accordance with government guidelines. People who are unwell or sick to get tested and stay home, monitor their health and seek medical advice if symptoms develop. Ensure all kitchen and bathroom facilities have sufficient supplies of cleaning products. Provide hand sanitisers/surface wipes in all project kitchens. Increase frequency of cleaning of food preparation, shared equipment, bathrooms, entrances, etc. Conduct video conference meetings in preference to face to face meetings where possible and practicable.	3
COVID-19 (Continued)	5. Traveling to known high risk countries or areas as identified by authorities and return to work.	1	5. Allow travel to other countries in line with federal government directions. Persons who return from overseas and are fully vaccinated must get a RAT within 24 hours of arrival and can stop self-isolating once they receive a negative result from this test. Get another RAT on or after day 6 of arrival. (People who are not fully vaccinated must go into 7 day mandatory quarantine). Communicate COVID-19 site rules to project team members through site inductions, site meetings, electronic communications, notice board, and or toolbox talks.	2
	6. Client closes down their facilities/site/operations	1	6. Follow client instructions and communicate to all project participants. Project Manager to monitor progress. Employees to be relocated to other projects. Manage project delays in accordance with the relevant contract.	2
	7. Workers absent	2	7. Identify alternate staff, contractors and casual labour sources as required. Organise a movement of employees between projects, regions and company in accordance with company travel policy and current travel restrictions. Administer actual and potential delays as per the contract as required	3
	8. Employees absent from work	1	8. Identify alternate staff or contractors and casual labour sources as required. Organise a movement of employees between projects, regions and company in accordance with company travel policy and current travel restrictions. Arrange remote access for employees to the network and systems (shared drive, Intranet, printers, video conferencing, emails etc.) to enable employees to work from home. Provide flexible working arrangement opportunities for employees in accordance with company policies	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
			as discussed and agreed with their manager. Cross train employees in important roles with limited contingency. Administer actual and potential delays as per the contract as required.	
	9. Supply chain issues/delays/absence	1	9. Identify and action high risk products and milestones affecting projects. Identify alternative suppliers or products and submit the Client for acceptance as required. (e.g. glass, lifts, etc.). Obtain advise from major suppliers/importers of products from oversees to understand and share risk and controls. E.g. lifts. Administer actual and potential delays as per the contract as required.	2
	10. Commercial and financial impacts on projects	1	10. CFO and Group Manager – Commercial to review implications with Project Manager project by project to identify and confirm appropriate contract and insurance response/provisions generally. Obtain legal advice on contractual implications to current projects e.g. force majeure conditions.	2
	11. Contract obligations not met (e.g. program)	1	11. Administer actual and potential delays as per the contract as required. Issue/propose contingency plans (alternative suppliers or products, handover etc.) for Client acceptance as soon as risk is known. Stay abreast of clients concerns and drivers through client meetings and communications.	2
COVID-19 (Continued)	12. Response to media	2	12. Follow client protocols defined in the contract. Only authorised employees are to respond to media in accordance with Procedure 39 - Responding to the Media.	3
	13. Access to IT systems and information not available on site.	2	13. Access internet based programs (Jobpac, Aconex, Payapps, Intranet, etc.). Avoid personal devises being used to access the network to reduce network security risk.	3
	14. Flexible working arrangements and greater mobility generally	2	14. Review and implement greater ability for video conferencing from mobile devices to office systems to facilitate more meetings by video. Communicate flexible working arrangements requirements regarding ITC.	3
Dealing with Emergencies E.g. Fire, explosion (gas, equipment, hazardous goods, bomb), spills (oils, chemicals etc.), structural collapse, civil unrest, natural disaster, medical emergency, harassment/assault, excavation cave in, drowning, etc.	1. Lack of project emergency and response procedures in case of: • Evacuation, • Fire (explosion), • Chemical spill, • Medical emergency • Harassment/assault, • Traffic incident, • Mobile plant contact with overhead power line, • Mobile plant collision/ rollover, • Electrical emergency • Fall arrest • Excavation collapse (Trench collapse/cave in) • Drowning (Water Emergency) • Extreme weather conditions (flood/cyclone) • Bomb Threat	1	1. Establish and maintain emergency response procedures using *Form 22.1* and Site Plan. (Refer *Procedure 22- Emergency Preparedness and Response*). Communicate emergency procedures to all workers and visitors in site Inductions.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	2. Lack of emergency provisions/resources to notify senior management and authorities and/or control the threat.	1	2. Provide and maintain fire extinguishers, Nurse Call systems, spill kit, emergency vehicle access, first aid facilities and assign assembly area. Provide signage for emergency equipment and areas. Install emergency lighting. Install operational fire hydrants and hose reels after the building has reached 12m in every story that is covered by a roof or floor structure above, except the 2 uppermost story's in accordance with BCA, Volume 1, Clause E 1.9 Fire precautions during construction.	2
	3. Ineffective emergency and evacuation program	1	3. Test Nurse Call/Sirens monthly. Test/inspect fire extinguishers 6 monthly. Conduct emergency tests/drills.	2
	4. Inadequate resources to manage injuries.	1	4. Review suitability of first aid requirements using "Project Emergency & Health Assessment" template (within HammerTech) as per Procedure 22 Emergencies and Evacuation. Establish and maintain Nurse Call systems, first aid facilities and qualified first aid personnel as per *Code Of Practice (COP) – First Aid in the Workplace*.	2
Public Movement Around site E.g. Pedestrian access and thoroughfares, Local traffic conditions, protection.	1. Inadequate public notices	1	1. Ensure pedestrian and traffic control plan is approved and is reviewed periodically to maintain public safety. Implement SWMS and work specific emergency plan for traffic control. Where needed, ensure pedestrian and traffic control plan is approved and is reviewed periodically to maintain public safety. Implement SWMS and work specific emergency plan for traffic control. Traffic to be directed, in accordance with the work zone traffic management plan. Work zone traffic management plan/s are to be established and maintained using the nominated traffic control devices as per the approved plan. Traffic controllers must hold a current traffic control work training card or temporary card for the type of traffic control work being performed.	2
	2. Pedestrians and drivers unaware of alterations to access / thoroughfare conditions.	1	2. Implement SWMS for traffic control. Erect signage to direct visitors to the site office for assistance.	2
	3. Inadequate pedestrian access	1	3. Ensure all signage is suitably placed and is clearly visible to pedestrians and drivers.	2
	4. Inadequate alternative traffic conditions and or control	1	4. Ensure all alternative access / thoroughfares / traffic conditions meet requirements.	2
	5. Contact with pedestrians and or vehicles	1	5. Implement SWMS for traffic control. Assign resources to control pedestrians / traffic when vehicles are entering or leaving the site. Erect fencing around site to prevent un-authorized entry. Erect Hoarding over pedestrians as required. *COP Overhead Protective Structures*.	2
	6. Public Domain works	1	6. Implement SWMS and work specific emergency plan for traffic control or working on/near roads. Obtain approval from Council to use footpaths or roads. *Local Government Act 1993*. All public protection issues are to follow Project Plan procedures. Ensure structural integrity of all external fences or walls to prevent collapse into public areas through bracing, weighting or other appropriate and approved method.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Working Within or Near Occupied Premises E.g. Public/tenant movement, movement of plant, authorizations to work (permit systems), closure of public areas, etc.	1. Isolations to existing services not carried out leading to injury.	1	1. Implement SWMS and work specific emergency plan for electrical work. Engage electrician to confirm existing circuits are protected, wiring is labelled, and isolations are in place before commencing work. Positively locate above and in ground services using non-destructive and vacuum pot holing methods. Implement permit to work systems (e.g. hot work, excavation, isolation of services, confined space and Drill/Core/Cut).	2
	2. Injuries to persons/public/tenant/or other entity located near or adjacent to the construction site.	1	2. Refer controls for "*Public Movement Around Site*" Fence off work site to prevent inadvertent access to the construction zone. Complete and implement actions from "Site Establishment Checklist" within HammerTech (Refer to Procedure 26 Site Establishment). Conduct and record regular meetings with the entities/parties to discuss/review management of hazards impacting on them and their impacts on the project. Protect public areas from falling and flying objects, dust and fumes using appropriate barriers, screens and extraction. Monitor noise levels and install noise barriers, re-program works or source alternative solutions. Perform regular hazard inspections in areas of public movement around site. Issue project information/updates through letterbox drops. Liaise with community groups/individuals. Refer to CEMP Appendix C2 (i) Major Event Managements Plan for major event management Refer to CEMP Appendix C2(k) Noise and Vibration Guidelines Refer to CEMP Appendix C2(k) Noise and Vibration Management Plan	2
Working Within or Near Occupied Premises (Continued)	3. Injuries to Client/public/tenant/or other entity accessing their premises/area through the construction work zone.	1	3. Confirm with Client/other entity *(ERTECH)*, their responsibilities for control of activities within their premises/work area (i.e. handover/PC). Establish and maintain clear and defined access paths through the work site to the occupied. Conduct brief induction for other entities applicable to their movement through the construction site to their premise/work area. Provide directional signage to guide persons to their premises. Fence off work site to prevent inadvertent access to the construction zone. Perform regular hazard inspections in areas of public movement around site. Conduct and record regular meetings with Client/other stakeholder *(ERTECH)* to discuss/review management of hazards impacting on them and on the project. Secure all gates to work areas when unattended and/or afterhours.	2
	4. Coordination of emergency response with Client or other entity working within the construction work zone.	1	4. Consult with the entities *(ERTECH)* in control of their work area/premises and develop a master emergency response plan detailing roles and responsibilities. Client or other entities *(ERTECH)* to induct their workers into a master emergency response plan. Conduct tests/drills together with Client or other entities *(ERTECH)* ensure emergency response plans are effective.	2
	5. Plant colliding with existing structures, public vehicles or persons.	1	5. Conduct plant risk assessment and implement controls. Implement SWMS and work specific emergency plan for working with/near powered mobile plant. Plant operators are to follow the Site Vehicle Movement Plan. Place physical barriers, delineation and or signage where needed between structures, other vehicles and people and moving plant	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	6. Fire from hot works.	1	6. Implement SWMS for hot work activities. Implement hot work permit system and issue approved permit prior to work commencement. Communicate hot work permit process to site workers through site inductions. Do not conduct hot works when building fire protection systems are offline. *COP - Welding Processes.*	2
Employee Wellbeing E.g. Fatigue, - Drugs and Alcohol, Stress, Work load (overload, underload, job demands or lack of role clarity or control), Exposure to traumatic events, workplace violence, bullying or harassment, poor workplace relationships/conflict or support from managers and co-workers, inadequate reward and recognition, hazardous physical work environments, poor processes for making decisions and poor organisational change consultation.	1. Exposure to psychosocial hazards at work	1	All general work activity hazards identified will be controlled through the Project Plan and procedures within. 1. Comply with COP Managing Psychosocial Hazards At Work. Implement Procedure 50 Wellbeing. Promote the use of Acacia Connect -Employee Assistance Program and Mates In Construction as anonymous independent mental health and wellbeing external resources. Promote the use of the Group Values Wellbeing Centre and Lockdown Support Information. Participate in team meetings and toolbox talks, company retreats and events. Additional consultation provided through the Inform Intranet Library, company update emails, weekly newsflash, company website, Instagram and LinkedIn social media pages. Develop skills and experience through: performance and development reviews, probationary reviews, internal and external training, skills and competency reviews, mentoring program and the Young Worker "Buddy System". Reports of psychosocial incidents are to be investigated inline with Procedure 18 Incident Management.	2
	2. Workers unable to concentrate or react to work situations effectively or safely.	1	1. Agree and define work hours and adhere to *Collective Agreement* (as relevant). Provide amenities as per *Procedure 26 Site Establishment.*	2
	3. Workers affected adversely by substances or acting in a way that puts themselves and or others in danger.	1	2. Implement *Drug and Alcohol Policy.*	2
	4. Workers experience anxiety and/or depression, which may lead to self- harm or harm to others.	1	3. Provide workers with access to Employee Assistance Professional Association of Australia through *Drug and Alcohol Policy.*	2
Employee Wellbeing (Continued)	5. Working night shift	1	4. Reduce need to work nights if possible. Allow a 24-hour rest period between each set of shifts for night-shift workers. Keep sequential night shifts to a minimum (no more than four nights in a row). Provide an adequate period of non-work following a sequence of night shifts. Allow regular night workers periods of normal night's sleep to catch up on their sleep debts. Ensure that rosters allow for at least two full nights' sleep after the last night shift. Arrange shifts so that day sleep is not restricted, and except for emergencies, give at least 24 hours notice before night work.	2
	6. Travelling long distances to and from sites	1	5. Take a break every 2 hours. Share the driving with others if possible. Organize overnight stays. Place workers close to home where possible. Use public transport to move between sites, meetings etc. where practical or available. Employees to notify their managers if they are unfit to drive safely due to fatigue or	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
			any other reason.	
	7. Working outdoors in remote areas	1	6. Regularly check in with other workers, what equipment should be carried Satellite phone, Radio etc.) weather conditions.	2
Design Implications E.g. Drawing changes, scope changes/variations leading to new risks. WHS Buildability issues.	1. Unidentified hazards and controls due to poor or no review of approved design.	1	1. Review the existing design documents to determine the buildability hazards and the construction methodology (as detailed in the scopes of work). Identify and assess the buildability hazards within this project risk assessment document under each construction activity. Implement design/buildability controls through Project Plan, Subcontractor SWMS(s), inductions etc.	2
	2. Unidentified hazards and controls due to poor or no review / monitoring of design changes.	1	2. Review and assess design and other changes prior to work being approved for construction, as per *Procedure 10 Design Management*. Review drawing changes for new hazards. Communicate new hazards to all affected organizations/work teams for action.	2
Procurement E.g. Purchasing and Subcontracting goods and services	1. Unsafe plant and equipment (hired or purchased).	1	1. Obtain safe operating instructions (in English) & maintenance/inspection records. Plant and equipment to comply with the relevant Australian Standards. Obtain registration records of plant as appropriate. Obtain noise emission information to ensure noise levels do not exceed an 8-hour noise equivalent of 85 dB(A), or peak at more than 140 dB(C). If not, source alternative equipment, or implement controls to reduce exposure such as providing safe distances from other workers, hearing protection, noise barriers etc. Electrical equipment to be tested and tagged as per *AS NZS 3012 Electrical installations - Construction & demolition* sites. Provide licensed and competent operator in accordance with WHS legislation and company procedures.	2
	2. Substances are hazardous and/or dangerous to use.	1	2. Source low risk alternative product where possible. Request/obtain SDS. Use hazardous substances and dangerous goods as per SDS requirements. Provide spill response equipment. Provide first aid facilities. Provide fire response equipment near store. Provide appropriate store with signage and segregation of dangerous goods in accordance with *Procedure 21 - Hazardous Substances & Dangerous Goods*.	2
Procurement (Continued)	3. Ineffective or inappropriate PPE.	1	3. Consult with HSR/workers affected on use and application to determine the most suitable product. PPE to comply with relevant Australian Standard. Provide Instructions on use, fitting, storage and maintenance to users. Maintain a PPE register record.	2
	4. Unsafe on-site work practices (Subcontractors)	1	4. Engage preferred Subcontractors (do not use those listed in *Document 5.2 - Non-Preferred Subcontractor List*). Evaluate new subcontractors (Refer *Procedure 5 – Subcontractors*). Issue WHS requirements in tender documentation including referenced WHS forms and documents. Obtain Subcontractor Risk Assessment Review records prior to work.	2
	5. Non-compliant and hazardous building products	1	5. Engage preferred Subcontractors/suppliers. Include subcontract conditions requiring certification or other evidence of compliance to relevant Australian Standards and National Construction Code (NCC). Nominate compliant products or systems during design and	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
			development. Use products/materials specified by consultants/engineers. Prior to installation, obtain certification of conformity from suppliers/subcontractors to verify compliance.	
	6. Unsuitable labour hire workers.	1	6. Engage preferred labour hire companies with demonstrated past performances or evaluate new hire companies (Refer *Procedure 5 – Subcontractors*). Issue details of job requirements, work environment, relevant task health and safety risks and required skills/knowledge to the labour hire company as applicable. Obtain competency records as required. Site Induct all labour hire persons. Provide supervision and instruction. Work to be performed as per approved SWMS and work specific emergency plan for high risk work (refer to activities, hazards and controls below where relevant to the tasks).	2
	7. Modern slavery practices in the supply chain	2	7. Inform workers on modern slavery through inductions. Communicate Lipman's Supplier Code of Conduct to all subcontractors/suppliers. Ensure agreements/contracts include Modern Slavery clauses. Assess modern slavery performance an capabilities for new subcontractors/supplier. Report, investigate and remediate modern slavery incidents as per Procedure 18 – "incident Management". Comply with Modern Slavery legislation.	3
General Work Activities on Site E.g. General construction activities including supervision, coordination and management of workers, their materials and equipment.	1. Voids or penetrations not covered leading to falls or injury from falling objects.	1	All general work activity hazards identified will be controlled by the project management team through Project Plan and the procedures within. 1. Implement SWMS for installing penetration covers/barriers. Install void & penetration covers, secure and label to prevent inadvertent/unauthorized removal. Install in-cast mesh (max mesh gauge of 50mmX50mm) where practicable. Alternatively fence off area to prevent access.	2
	2. Injuries caused by protruding objects (Reo, bars or similar)	1	2. Cap all starter bars.	2
	3. Injuries from use of powered and non-powered plant and equipment and hand tools.	1	3. Implement SWMS for operating powered mobile plant. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. Use ticketed operators. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Select and use correct tool for the task. Inspect tools for damage. Earthmoving machinery designed for seated operator must have operator protective structures fitted. Either ROPS/FOPS or both depending on application – Refer to Procedure 25 – "Plant & Equipment". Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	4. Fall from height whilst working on formwork decks, scaffold, roof areas, building edges, using ladders etc.	1	4. Implement SWMS and work specific emergency plan for working with a risk of fall over 2m. Maintain clear access and working areas. Fall prevention in place around unprotected *edges COP – Managing the Risk of Falls at Workplaces*. Obtain Scaffold handover certificate upon completion and prior to use. Obtain Safety Mesh handover certificate upon installation and prior to access to roof. Fall prevention devices or equipment must be verified as installed to the relevant legislation or manufacturer's requirements using a handover certificate and included in regular site inspections - Refer to Procedure 25 – "Plant & Equipment". Inspect mobile scaffold and ground conditions before use. Do not use ladders (except ones with working platforms) unless approved by the Site Manager.	2
	5. Falling objects whilst working at heights.	1	5. Implement SWMS and work specific emergency plan for working with a risk of fall over 2m. Secure equipment and tools whilst working at heights. Provide mesh/screening as required. Establish exclusions zones as required.	2
	6. Manual handling injuries.	2	6. Comply with *COP for Hazardous Manual Tasks*. Plan for and assign suitable area for storage and movement of materials. Use mechanical means where possible (e.g. crane, forklift, material hoists, trolley etc.). Provide training for employees as required. Implement SWMS for working with powered mobile plant.	3
General Work Activities on Site, (Continued)	7. Working in confined spaces	1	All general work activity hazards identified will be controlled through Project Plan and procedures within. 7. Implement SWMS and work specific emergency plan for confined space work. Comply with *WHS Regs Part 4.3 Division 3 Confined Spaces* and *COP – Confined Spaces*. Confined space signage, permit/checklist, stand by person, air monitoring, training and monitoring access.	2
	8. Working in enclosed areas without proper ventilation (e.g. basement) being exposed to hazardous fumes, vapours, odours, etc.	1	8. Implement SWMS. Provide sufficient ventilation through portable and fixed fans (where possible). Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace*. Use water-based alternatives where possible. Provide ventilation to keep the solvent vapours below the Australian Exposure Standard (ES). Obtain and read SDS to determine what PPE is necessary, and what engineering controls are appropriate. Train workers on how to use PPE. Check work area to ensure there are no ignition sources.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	9. Injury caused by entering and leaving traffic from site.	1	9. Where needed, ensure pedestrian and traffic control plan is approved and is reviewed periodically to maintain public safety. Implement SWMS and work specific emergency plan for traffic control. Traffic to be directed, in accordance with the work zone traffic management plan. Work zone traffic management plan/s are to be established and maintained using the nominated traffic control devices as per the approved plan. Traffic controllers must hold a current traffic control work training card or temporary card for the type of traffic control work being performed. Refer to CEMP Appendix C2(j) Traffic And Pedestrian Management Sub Plan	2
	10. Fire from hot works (use of Oxy set/grinder etc.).	1	10. Implement SWMS and work specific emergency plan for hot works. Implement hot work permit system as required (Obtain hot work permit prior to work commencement. *COP – Welding Processes*).	2
	11. Disposal of contaminated storm water.	2	11. Install silt and waste barriers for storm water runoff. Collect and remove contaminated storm water off site using licensed providers. Conduct inspections to monitor water wastage and spills.	3
	12. Noise disturbance to neighbours or community caused by operating plant and equipment.	2	12. Comply with DA requirements for noise management and control. -Work within the permitted hours. Monitor noise levels as per Project Plan. Refer to CEMP Appendix C2(k) Noise and Vibration Guidelines Refer to CEMP Appendix C2(k) Noise and Vibration Management Plan	3
	13. Damage to protected flora fauna, buildings and structures.	2	13. Fence off areas to be protected to prevent access or damage to protected areas. Inspect condition of fencing periodically. Refer to CEMP Appendix C2 (p) PRM Flora And Fauna Management Plan	3
General Work Activities on Site, (Continued)	14. Fire when refuelling portable equipment.	1	All general work activity hazards identified will be controlled through Project Plan and procedures within. 14. *COP – Managing Risks of Hazardous Chemicals in the Workplace.* Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	15. Working in poor weather conditions causing slips, electrocution, disease, being hit by objects, heat stress.	1	15. Dewater working areas and access ways after rain. Check for frost/ice on working surfaces and remove prior to working. Electrical tools not to be used in wet weather, ensure temporary electrical distribution boards are waterproof & secured in place and cease work on/with conductive structures during lighting storms. Reduce the spread of disease by providing clean washing and eating facilities and contagious persons to be sent home. Secure loose materials, re-schedule crane/lifting operations and damped areas to suppress dust in windy conditions. Provide drinking water, shaded areas, amenities with air-conditioning and induct workers on hazards in high heat conditions and sun exposure. Conduct hazard inspections of site after rain and prior to start or re-start of work.	2
	16. Collapse of structures.	1	16. Implement SWMS and work specific emergency plan for temporary support of structures. Structural support systems and temporary structures to be designed, installed and inspected by suitably qualified persons to relevant legislation, codes of practice and Australian standards. Proprietary items to be installed in accordance with manufacturer's requirements by a competent person, and verified as correctly installed prior to use. Design drawings, risk assessment and engineer's certifications available. Building structures, materials, foundations etc. are to be assessed and controls in place prior to starting alterations to the structure or construction of temporary structures. Effectiveness and condition of supports shall be inspected and monitored through site inspections. Obtain Demolition Plan from Subcontractor (Refer "Demolition Work" section below). Ensure structural integrity of all external fences or walls to prevent collapse into public areas through bracing, weighting or other appropriate and approved method.	2
	17. Injuries to persons within the site boundaries caused by movement of vehicles and powered plant.	1	17. Implement SWMS and work specific emergency plan for working in an area with powered mobile plant. Prepare Site Vehicle Movement Plan to manage and control movement of powered plant and vehicles including trucks within the site boundaries. Communicate Site Vehicle Movement controls in induction and to Operators. Monitor effectiveness of controls daily and through weekly hazard inspections. Conduct plant risk assessment with Operator prior to work commencement.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
General Work Activities on Site, (Continued)	18. Exposure to asbestos discovered during works.	1	18. Implement SWMS for working with asbestos. Immediately cease works in the area. Protect and isolate area (i.e. place signage, encapsulate area). Conduct air monitoring and get clearance certificates. Engage Licenced Asbestos Assessor to test the material and provide instructions to safely remove the material. Asbestos removal & disposal by licensed Subcontractors as per *COP – How to Safely Remove Asbestos, State WHS Regulations* and Clause 42 Protection of the Environment Operations (Waste) Regulation. Asbestos management plan to be prepared and submitted. The "Asbestos Checklist" template within HammerTech to be completed and accepted prior to removal works commencing as per Procedure 5 Subcontractors. Implement SWMS for working with asbestos. Refer to CEMP Appendix C2 (n) PRM Asbestos Management Plan	2
	19. Exposure to lead-based paint particles.	1	19. Implement SWMS for removing lead-based paints. Immediately cease works in the area. Protect and isolate area (i.e. place signage, encapsulate area). Conduct air monitoring and get clearance certificates. Engage Occupational Hygienists to test the material and provide instructions to safely remove the material. Remove and disposed as per Occupational Hygienists instruction.	2
	20. Exposure to hazardous substances (Including silica dust)	1	20. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	21. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	21. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Temporary Support Structures including formwork, falsework, shoring, panel bracing, edge protection, propping and other structural support systems	1. Unplanned collapse	1	1. Subcontractor to implement controls as per approved SWMS and work specific emergency plan. Structural support systems and temporary structures to be designed by suitably qualified persons (designer or appropriate engineer). Building structures, materials, foundations etc. are to be assessed and controls in place prior to starting alterations to the structure or construction of temporary structures. Support structures to be installed by a competent person and verified as correctly installed prior to use in accordance with drawings, relevant legislation Codes of Practice or Australian Standards. Proprietary items are to be installed in accordance with manufacturer's requirements. Effectiveness and condition of supports shall be inspected and monitored through site inspections. Changes to the support structure design or installation to be approved by the relevant engineer.	2
	2. Fall from heights or falling objects	1	2. Subcontractor to implement controls as per approved SWMS. Provide safe access and perimeter fall protection. Penetrations to be covered or barricaded and suitable signage placed. Isolation/barricading of work areas as required. Engineer's certification for lifting points and method for lifting (such as wall or column formwork assemblies).	2
	3. Mechanical damage	1	3. Temporary support structures shall be adequately protected/isolated against mechanical damage or potential impact by mobile plant or traffic, and be designed to withstand foreseeable loads.	2
	4. Exposure to hazardous substances (Including silica dust)	1	4. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	5. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	5. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Erection and Use of Loading Platforms	1. Falls	1	1. Implement SWMS and work specific emergency plan for working with a risk of fall over 2m. Keep gates closed when not in use. Do not work above handrail height.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	2. Collapse of structure due to inadequate supports	1	2. Implement SWMS and work specific emergency plan for temporary support of structures. Structural support systems and temporary structures to be designed, installed and inspected by suitably qualified persons to relevant legislation, codes of practice and Australian standards. Proprietary items to be installed in accordance with manufacture's requirements by a competent person and verified as correctly installed prior to use. Building structures, materials, foundations etc. are to be assessed and controls in place prior to starting alterations to the structure or construction of temporary structures. Obtain engineers certificates for safe working load on suspended slabs/floor. Only competent person to install platforms. Proprietary items to be installed in accordance with manufacturer's requirements. Platforms to be identified with Safe Work Load (SWL). Inspect platform and supports periodically and after any incident. Obtain installation certificate sign off.	2
	3. Plant & Equipment failure during installation and removal of platforms.	1	3. Conduct Prestart and daily checks on plant. Maintain registers. Obtain competency records for operators. Refer "*Use of Mobile Cranes*" and "*Use of Tower Cranes*" hazard categories for crane specific control measures. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*	2
	4. Exposure to hazardous substances (Including silica dust)	1	4. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	5. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	5. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

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Cleaning & Disposal of Waste	1. Needle stick injuries sustained from removing syringes.	1	1. Implement SWMS for collecting & removal of sharps. Collect and dispose of used needles using PPE and approved containers. Communicate in Site Inductions.	2
	2. Disposal of general waste material (Soil, metals, timber, etc.) from construction activities.	2	2. Removal of waste activities conducted in accordance *Protection of the Environment Operations Act 1997*, and *Protection of the Environment Operations (waste) Regulation 1996*. Provide bins for collection and/or recycling of all waste. Dispose of waste off site regularly. Comply with DA Requirements.	3
	3. Material falling from vehicles whilst being transported to and from site.	2	3. Ensure vehicles removing waste from site are fully covered.	3
	4. Cleaning of concrete truck pumps, muddy truck tyres, paints, or other equipment associated with the construction.	2	4. No washing of plant/equipment into storm water drains. Concrete pumps to be washed off site. Establish wash down area for concrete truck chutes as required. Remove excess soil from truck leaving site and inspect and clean footpaths and streets. Establish wash down facilities for painters/plasterers or others.	3
	5. Exposure to hazardous substances (Including silica dust)	1	5. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
Chemical Storage	1. Injuries from contact with Hazardous substances and dangerous goods not stored properly within chemical store(s).	1	1. Maintain registers and review SDS. Establish suitable store as per *Procedure 21 -Hazardous Substances and Dangerous Goods*. Provide fire extinguisher and first aid facilities.	2
	2. Chemical spills from refuelling or storage activities contaminating soils.	2	2. Provide and maintain spill kits. Provide bunding.	3

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Surveying site	1. Working alone. (e.g. time taken to reach help)	1	1. Project management team member to supervise works. Provide first aid kit on site. Wear mandatory PPE (hard hat, high visibility vest and safety footwear). Worker to obtain approval from Site Manager/Supervisor prior to working outside normal hours.	2
	2. Workers struck by powered mobile plant.	1	2. Implement SWMS and work specific emergency plan for working in an area with powered mobile plant. Surveyors to place warning signs, barricades or other barriers to notify other workers of surveying works being conducted. Site Vehicle movement plan to detail the controls in place and be communicated to all workers via site inductions.	2
	3. Sun glare and UV exposure.	1	3. Wear required PPE (brim on hard hats, apply sunscreen every 2 hours, wear long sleeves, pants as appropriate) and limit exposure where possible.	2
	4. Exposure to hazardous substances (Including silica dust)	1	4. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	5. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	5. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit)	2
Set-Out Work	1. Injury from moving Plant and Equipment	1	1. Implement SWMS and work specific emergency plan for working in an area with powered mobile plant. Establish working zones on Site Plan. Induct all workers. Ensure all traffic control measures are in place. State WHS Regulations to be referenced when considering control measures for plant, tools and equipment.	2
	2. Exposure to hazardous substances (Including silica dust)	1	2. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

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Set-Out Work	3. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	3. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Working Around Pier holes, Pad Holes & Footing Trenches	1. Falling into Pad Holes, Pier holes & Footing Trenches Falling into holes	1	1. Implement SWMS and work specific emergency plan for working in an area with a fall of 2m or more. Fence/barricade around exposed holes and excavated areas. Place Signage and cover.	2
	2. Exposure to hazardous substances (Including silica dust)	1	2. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	3. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	3. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

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Tree and Vegetation Clearing	1. Falling trees	1	1. Implement SWMS and work specific emergency plan for working with or near powered mobile plant. Register and maintain Plant and Equipment. Test and tag (as applicable). Conduct Prestart, daily and weekly checks on plant. Refer *Procedure 25 Plant & Equipment*. Obtain competency certificates for operators. If using earthmoving machinery, FOPS are required to be fitted to the cabin. Refer CEMP Appendix A5 Tree Protection And Removal Plan	2
	2. Injury from use of equipment (boom lifts, Chainsaws, etc.)	1	2. Implement SWMS and work specific emergency plan for working 2m above ground. Check weather conditions prior to work. Avoid working in high wind, heavy rain and storm conditions.	2
	3. Slips, falls and lighting strikes caused by working in poor weather conditions.	1	3. Refer controls in 2 above. Contact the electricity authority on the proposed work and comply with any special conditions. Isolate lines where possible. Install tiger tails to power lines. Maintain minimum safe distance from overhead power lines as per *AS 2550.1 Safe Use of Cranes, Section 6*. Implement *Procedure 25 Plant & Equipment*	2
	4. Electrocution (working near overhead power lines)	1	4. Contact the electricity authority on the proposed work and comply with any special conditions. Isolate lines where possible. Install tiger tails to power lines. Maintain minimum safe distance from overhead power lines as per *AS 2550.1 Safe Use of Cranes, Section 6*. Implement *Procedure 25 Plant & Equipment*.	2
	5. Damage to existing or protected flora or fauna.	2	5. Obtain council approval prior to clearing trees. Fence off areas to be protected to prevent access or damage to vegetation. Inspect condition of fencing periodically. Comply with DA Requirements. Refer CEMP Appendix A5 Tree Protection And Removal Plan Refer CEMP Appendix C2(p) PRM Flora And Fauna Management Plan	3
	6. Fire when refuelling portable equipment.	1	6. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Underpinning, Shoring or Piling	1. Plant & Equipment	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan and *COP – Managing Risks of Plant in the Workplace*. 1. Conduct Prestart and daily checks on plant. Maintain registers and checklists as per Project Plan. Obtain competency records High Risk work license obtained for operators as per *WHS Act and Regulations 2017*. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*. Earthmoving machinery designed for seated operator must have operator protective structures fitted. ROPS and FOPS required to be fitted to cabin – Refer to Procedure 25 Plant & Equipment.	2
	2. Collapse	1	2. Prepare, submit and implement a *Safety Management Plan* for the structural support systems. Structural support systems and temporary structures to be designed, installed and inspected by suitably qualified persons to relevant legislation, codes of practice and Australian standards. Proprietary items to be installed in accordance with manufacture's requirements by a competent person and verified as correctly installed prior to use. Building structures, materials, foundations etc. are to be assessed and controls in place prior to starting alterations to the structure or construction of temporary structures. Proprietary items to be installed in accordance with manufacturer's requirements. Obtain structural certification for works before proceeding with demolition or excavation. Effectiveness and condition of supports shall be inspected and monitored through site inspections.	2
	3. Working in confined space	1	3. Comply with *WHS Regs Part 4.3 Division 3 Confined Spaces and COP – Confined Spaces*. Confined space signage, permit/checklist, stand by person, air monitoring, training and monitoring access	2
	4. Isolations to existing services not carried out leading to injury.	1	4. Locate and isolate existing services (where practical) before piling. Dial before you dig 1100, *COP - Work Near Underground Assets*. Positively locate above and in ground services using non-destructive and vacuum pot holing methods. Obtain relevant work permits including Excavation permit from Site Manager/Supervisor.	2
	5. Noise, vibration	2	5. Monitor noise levels so as workers not exposed to 85 dB continuously. Adhere to DA conditions. Wear PPE as per SWMS. Refer CEMP Appendix C2 (k) Noise And Vibration Guild lines Refer CEMP Appendix C2 (k) Noise and Vibration Management Plan	3

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	6. Exposure to hazardous substances (Including silica dust and acid sulphate Soils)	1	6. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required Manage Acid sulphate soils as per PRM acid sulphate soil management plan Refer CEMP Appendix C2 (g) PRM Soil and water Management Plan	2
Underpinning, Shoring or Piling	7. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	7. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Demolition Work	1. Isolations to existing services not carried out leading to injury.	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan. Demolition Plan to be developed in accordance with relevant legislation, *COP – Demolition Work, COP – Managing Risks of Plant in the Workplace, Australian Standard (AS 2601)* and other relevant codes applicable to the scope of work. COP – Managing Risks of hazardous Chemicals in the Workplace. "Demolition Checklist" template to be completed within HammerTech and accepted prior works commencing (Refer to Procedure 5 Subcontractors). 1. Locate and isolate existing services before excavation and or demolition. Positively locate above and in ground services using non-destructive and vacuum pot holing methods. Obtain relevant work permits from Site Manager/Supervisor.	2
	2. Injury to workers and public from falling objects or projectiles.	1	2. Secure equipment and tools whilst working at heights. Provide mesh/screening as required. Establish exclusion zones as required. *COP - Overhead Protective Structures*	2
	3. Malfunction of plant and equipment or misuse.	1	3. Conduct Prestart and daily checks on plant. Maintain registers and checklists as per Project Plan. Refer *Procedure 25 Plant & Equipment*. Obtain competency records for operators. Establish and maintain exclusion zones. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*. Earthmoving machinery designed for seated operator must have operator protective structures fitted. Where there is a risk of falling objects, ROPS and FOPS are to be fitted to cabin – Refer to Procedure 25 – "Plant & Equipment". Ensure physical barriers e.g. Wheel stops are in place to ensure that mobile plant and equipment is unable to roll or drive off the edge of a structure and fall from height. Wherever practicable, barriers shall be installed before plant and equipment is allowed to access the work area. Operators are to follow the Site Vehicle Movement Plan.	2
	4. Being hit by or Run over by machines	1	4. Wear high visibility vests and hard hats. Use delineated access and egress paths. Do not walk behind moving plant, if crossing paths with plant make eye contact with the operator and wait for a signal to proceed.	2
	5. Asbestos exposed during demolition.	1	5. Asbestos removal & disposal by licensed Subcontractors as per *COP – How to Safely Remove Asbestos, State WHS Regulations* and *Clause 42 Protection of the Environment Operations (Waste) Regulation*. Asbestos management plan to be prepared and submitted. Conduct air monitoring and get clearance certificates. "Asbestos Checklist" template to be completed within HammerTech and accepted prior to removal works commencing (Refer to Procedure 5 Subcontractors). Implement SWMS for working with asbestos. Refer to CEMP Appendix C2 (n) PRM Asbestos Management Plan	2
	6. Dust generated from construction activities in high winds.	2	6. Re- program activities during strong winds. Dampen areas and demolish in stages. Comply with DA Requirements. Refer	3
	7. Fumes from plant and equipment used on site	2	7. Plant and equipment to be maintained and not to be left running whilst not in use for extended periods.	3

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Demolition Work (Continued)	8. Noise disturbance to neighbours or community caused by operating plant and equipment and demolition work.	2	8. Monitor noise levels as per *Procedure 13 - Noise Management*. - Comply with DA requirements for noise management and control. Work within the permitted hours. Monitor noise levels as per Project Plan. Refer to CEMP Appendix C2(k) Noise and Vibration Guidelines Refer to CEMP Appendix C2(k) Noise and Vibration Management Plan	3
	9. Damage to protected vegetation, buildings and structures.	2	9. Fence off areas to be protected to prevent access or damage to vegetation, buildings of structures. Inspect condition of fencing periodically. Obtain relevant work permits from Site Manager/Supervisor. Refer CEMP Appendix A5 Tree Protection And Removal Plan Refer CEMP Appendix C2(p) PRM Flora And Fauna Management Plan	3
	10. Waste disposed of illegally.	1	10. Waste to be segregated, recycled, re-used and if not possible, disposed of at approved waste facilities. Trucks removing waste to be covered. Obtain tip receipts/records.	2
	11. Fire when refuelling portable equipment.	1	11. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2
	12. Exposure to lead-based paint particles.	1	12. Immediately cease works in the area. Protect and isolate area (i.e. place signage, encapsulate area). Remove and disposed as per Occupational Hygienists instructions.	2
	13. Fire from hot works (use of Oxy set/grinder etc.)	1	13. Notify Site Manager/Supervisor of proposed hot works. Obtain hot work permit prior to work commencement as directed. Implement hot work permit controls as defined (*COP – Welding Processes*). Monitor and inspect the area for smouldering material at least 30 mins after work is complete.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	14. Collapse of structures.	1	14. Structural support systems and temporary structures to be designed, installed and inspected by suitably qualified persons to relevant legislation, codes of practice and Australian standards. Proprietary items to be installed in accordance with manufacture's requirements by a competent person and verified as correctly installed prior to use. Building structures, materials, foundations etc. are to be assessed and controls in place prior to starting alterations to the structure or construction of temporary structures. Proprietary items to be installed in accordance with manufacturer's requirements. Design drawings, risk assessment and engineer's certifications available. Effectiveness and condition of supports shall be inspected and monitored through site inspections. Ensure structural integrity of all external fences or walls to prevent collapse into public areas through bracing, weighting or other appropriate and approved method.	2
	15. Using Mobile Plant in Crane Mode	1	15. Do not exceed manufacture's specifications. Ensure the rated lifting capacity will be the maximum load that can be safely handled at the maximum lift radius without strength and stability devices. All lifting points must form a closed eye to which a load rated shackle can be attached, and each lifting point must be tested. Burst protection must be fitted to all mobile plant used as a crane. Operators must be trained to use the particular equipment they are required to use.	2
Demolition Work (Continued)	16. Exposure to hazardous substances (Including silica dust)	1	16. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	17. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	17. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	18. Truck Movements	1	18. Where needed, ensure pedestrian and traffic control plan is approved and is reviewed periodically to maintain public safety. Implement SWMS and work specific emergency plan for traffic control. Traffic to be directed, in accordance with the work zone traffic management plan. Work zone traffic management plan/s are to be established and maintained using the nominated traffic control devices as per the approved plan. Traffic controllers must hold a current traffic control work training card or temporary card for the type of traffic control work being performed.	2
Earthworks - Bulk and Detail Excavation (including establishing in-ground services).	1. Isolations to existing services not carried out leading to injury.	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan, *COP – Managing Risks of Plant in the Workplace and COP – Excavation Work. COP – Managing Risks of hazardous Chemicals in the Workplace* 1. Obtain approved excavation work permit prior to excavation. Positively locate above and in ground services using non-destructive and vacuum pot holing methods in addition to Dial before you dig 1100. Place barriers, flagging and/or signage on surface along the path of the services. Issue services location plan to all operators. *COP - Work Near Underground Assets*. Isolate before excavation where possible. Contact the relevant authority on the proposed work and comply with any special conditions. Obtain isolation work permit from Site Manager/Supervisor. Install tiger tails to power lines. Maintain minimum safe distance from overhead power lines.	2
	2. Unsafe means of access and egress	1	2. Provide scaffold stairs for workers and emergency (stretcher) access. Obtain handover certificate and monthly inspection certificates from scaffolding company.	2
Earthworks - Bulk and Detail Excavation (Continued) E.g. (including establishing in-ground services).	3. Falls into trenches, excavations etc.	1	3. Provide safe access into and egress from trenches. Fence / barricade around exposed holes and excavated areas. Provide signage. Clear or bind loose earth or rock from excavation edges and 'zone of influence'. Establish exclusion zone for workers, plant, equipment and materials way from 'zone of influence' of an excavation and access and egress paths. Inspect periodically to ensure controls remain effective.	2
	4. Unsafe use of mobile plant in and around excavation.	1	4. Conduct risk assessment of mobile plant prior to use and implement controls. Obtain Geotech reports to assess suitability of ground conditions near excavation. Ensure that the use of mobile plant in or near excavations does not put workers at risk from airborne contaminants e.g. Fumes. Comply with controls and restrictions identified in the site vehicle movement plan. Verify effectiveness of controls through hazard inspections. -Obtain competency records for operators.	2
	5. Surrounding structures and areas adversely affected.	1	5. Engineers to assess the safety of existing structures for effects. Obtain Geotechnical reports. Measures to prevent damage or collapse of structures to be implemented as per drawings. Refer to Underpinning, Shoring or Piling section above.	2
	6. Malfunction of plant and equipment or misuse.	1	6. Conduct Prestart and daily checks on plant. Maintain registers and checklists as per *Project Plan*. Refer *Procedure 25 Plant & Equipment*. Obtain competency records for operators. Establish and maintain exclusion zones.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	7. Fire when refuelling portable equipment.	1	7. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. *Refer Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2
	8. Cave-in	1	8. Obtain excavation work permit from Site Manager/Supervisor. Use Shoring/battering or benching sides for trenches >1.5m deep in accordance with Code of Practice – Excavation Work. Obtain Geotech report from engineer. Variance from the above COP must be approved and documented by a Geotech or other competent person. Structural support systems and temporary structures (shoring/battering) to be designed, installed and inspected by suitably qualified engineer prior to use. Building structures, materials, foundations etc. are to be assessed and controls in place prior to starting alterations to the structure or construction of temporary structures. Obtain drawings indicating methods to be used and Engineers certifications. Effectiveness and condition of supports shall be inspected and monitored through site inspections.	2
	9. Flooding	1	9. Identify possible water sources (in ground, storm, etc.). Isolate source if possible. Establish and maintain controls for removal of storm water. Cease work if flooding occurs. After heavy rain, inspect work area for hazards prior to entry. Prevent cave in as per above.	2
	10. Asbestos exposed during excavation	1	10. Asbestos removal & disposal by licensed Subcontractors as per *COP – How to Safely Remove Asbestos, State WHS Regulations* and *Clause 42 Protection of the Environment Operations (Waste) Regulation*. Asbestos management plan to be prepared and submitted. Conduct air monitoring and get clearance certificates. "Asbestos Checklist" template to be completed within HammerTech and accepted prior to removal works commencing (Refer to Procedure 5 Subcontractors). Implement SWMS for working with asbestos. Refer to CEMP Appendix C2 (n) PRM Asbestos Management Plan	2
Earthworks - Bulk and Detail Excavation (Continued) E.g. (including establishing in-ground services).	11. Working in confined spaces	1	11. Comply with *WHS Regulations Part 4.3 Division 3 Confined Spaces and COP – Confined Spaces*. Confined space signage, permit/checklist, stand by person, air monitoring, training and monitoring access.	2
	12. Process for responding to emergency situations above not defined or understood.	1	12. Develop emergency procedures for the excavation and communicate to workers via SWMS.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	13. Noise disturbance to neighbours or community caused by operating plant and equipment and excavation work.	2	13. Monitor noise levels as per *Procedure 13 - Noise Management*. Comply with DA requirements for noise management and control. Work within the permitted hours. Monitor noise levels as per Project Plan. Refer to CEMP Appendix C2(k) Noise and Vibration Guidelines Refer to CEMP Appendix C2(k) Noise and Vibration Management Plan	3
	14. Pollution of waterways with sediment, soil or other site refuse run off from site into storm water.	2	14. Erosion and sediment controls in place (including signage), maintained. Locate stockpiles away from footpaths or other areas that may lead to discharge into storm water. Inspect erosion and sediment controls periodically and after rainfall. Divert clean water runoff around the construction area. Backfill trenches as work progresses. Comply with DA Requirements.	3
	15. Dust	2	15. Re- program activities during strong winds. Dampen areas. Cover stockpiles. Comply with DA Requirements. Avoid dry cutting or drilling.	3
	16. Airborne contaminants in excavation eg. Dust, fumes	2	16. Implement controls to ensure people are not exposed to risk of harm from airborne contaminants such as dust, fumes, asbestos etc. Refer to CEMP Appendix C2 (n) PRM Asbestos Management Plan Refer to CEMP Appendix C2 (l) PRM Air Quality Management Plan	3
	17. Odours generated from accessing sewer chambers and pipe work.	2	17. Cover sewer access chambers and pipe work when not in use.	3
	18. Damage to unknown heritage, aboriginal or archeologically items found whilst conducting earthworks.	2	18. Identify and control access to the area and notify Client and relevant authorities as per Project Plan.	3
	19. Damage to protected trees	2	19. Provide fencing around identified trees to be protected. Comply with DA Requirements. Refer CEMP Appendix A5 Tree Protection And Removal Plan Refer CEMP Appendix C2(p) PRM Flora And Fauna Management Plan	3
	20. Using Mobile Plant in Crane Mode	1	20. Do not exceed manufacture's specifications. Ensure the rated lifting capacity will be the maximum load that can be safely handled at the maximum lift radius without strength and stability devices. All lifting points must form a closed eye to which a load rated shackle can be attached, and each lifting point must be tested. Burst protection must be fitted to all mobile plant used as a crane. Operators must be trained to use the particular equipment they are required to use. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Earthworks - Bulk and Detail Excavation (Continued) E.g. (including establishing in-ground services).	21. Exposure to hazardous substances (Including silica dust, Acid Sulphate Soils)	1	21. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required. Manage Acid sulphate soils as per PRM acid sulphate soil management plan	2
	22. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	22. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
	23. Truck Movements	1	23. Where needed, ensure pedestrian and traffic control plan is approved and is reviewed periodically to maintain public safety. Implement SWMS and work specific emergency plan for traffic control. Traffic to be directed, in accordance with the work zone traffic management plan. Work zone traffic management plan/s are to be established and maintained using the nominated traffic control devices as per the approved plan. Traffic controllers must hold a current traffic control work training card or temporary card for the type of traffic control work being performed. Refer CEMP Appendix C2(j) Traffic and Pedestrian Management Plan	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Use of Mobile Cranes	1. Crane hitting people or property (including set up and establishment of the mobile crane, loading and unloading activities form a public area)	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan and *COP – Managing Risks of Plant in the Workplace and Safework Australia Guide to Mobile Cranes. In Queensland use COP – Mobile Cranes.* 1. Conduct risk assessment and implement controls for use of mobile plant on arrival. Use Ticketed operators. Wear high visibility vest. - create exclusion zone eg. Fence/barricade around work area.. Where needed, ensure pedestrian and traffic control plan is approved and is reviewed periodically to maintain public safety. Implement SWMS and work specific emergency plan for traffic control. Traffic to be directed, in accordance with the work zone traffic management plan. Work zone traffic management plan/s are to be established and maintained using the nominated traffic control devices as per the approved plan. Traffic controllers must hold a current traffic control work training card or temporary card for the type of traffic control work being performed. Conduct Hazard Inspections around crane works area.	2
	2. Crane overturning (ground instability, over balancing)	1	2. Establish setup area as per site plan. Project management team to survey work area for underground services (Dial before you dig 1100). Project management team to obtain Geotech report for ground stability and issue to subcontractor. Obtain plant operator competency certificates. Provide Site Plan layout to the operator of the crane identifying location for the crane to be setup and operated. Obtain lift plan/study for Complex Lifts (Refer *Procedure 25 – "Plant & Equipment"* and *AS 2550.1 Cranes - Safe use*).	2
	3. Falling loads.	1	3. Obtain certificates for all lifting equipment. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2 and Procedure 25 Plant & Equipment*. Safe work load markings clearly visible and identifiable on lifting equipment. Obtain lift plan/study for Complex Lifts (Refer *Procedure 25 – "Plant & Equipment"* and *AS 2550.1 Cranes - Safe use*). Use Ticketed operators to attach, sling and direct loads. Operator to review the rated lifting capacity chart in relation to the load and not proceed if crane is working over capacity.	2
	4. Mechanical Failures	1	4. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment* and *AS 2550.1-2002 Cranes - Safe use*. Obtain current service/maintenance record for the plant. Operator to provide current competency certification and yearly inspection certification (Crane Safe).10 yearly inspection report required for cranes over 10 years old.	2
	5. Injury or illness caused by working in poor weather conditions.	1	5. Check for frost/ice on working surfaces and remove prior to working. Cease work during lighting storms. Secure loose materials/loads and re-schedule crane operations in windy conditions. Check. stability of ground conditions after heavy rain.	2
	6. Noisy machinery	2	6. Monitor noise levels as per *Procedure 13 Noise Management*. Comply with DA Requirements. Refer to CEMP Appendix C2(k) Noise and Vibration Guidelines Refer to CEMP Appendix C2(k) Noise and Vibration Management Plan	3

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	7. Excessive fumes from exhausts polluting the air	1	7. Plant and equipment not to be left running whilst not in use for extended periods. Maintain plant as per manufacturer Req.	2
Use of Mobile Cranes (Continued)	8. Electrocution (working near overhead power lines).	1	8. Refer controls in 4 above. Contact the electricity authority on the proposed work and comply with any special conditions. Isolate lines where possible. Install tiger tails to power lines. Maintain minimum safe distance from overhead power lines as per *AS 2550-1 Safe Use of Cranes Section 6*. Implement *Procedure 25 Plant & Equipment*.	2
Reo. / Steel Fixing and Post Tensioning	1. Trips and falls	1	Subcontractor to Implement controls as per approved SWMS. 1. Maintain clear access and working areas. Coordinate with Lipman Management the optimal location for landing loads onto formwork decks for structural adequacy. Place bar caps and or impalement protection on any exposed reo. Cover PT pans until filled.	2
	2. Injuries from use of electrical equipment.	1	2. Check testing and tagging is current as per *AS/NZS 3012 Electrical installations. Construction and demolition sites*. Check for damaged lead or equipment. Electrical leads to be elevated on insulated hooks or stands	2
	3. Injury or illness caused by working in poor weather conditions.	1	3. Dewater working areas and access ways. Electrical tools not to be used in wet weather and cease work on/with conductive structures during lighting storms.	2
	4. Fire, cuts, burns from use of Oxy set	2	4. Implement controls as per SWMS. Obtain Hot Works permit	3
	5. Manual handling injuries	2	5. Comply with *COP - Hazardous Manual Tasks*. Store and move materials as agreed with project management team. Use mechanical means where possible (e.g. crane, forklift, material hoists, trolley etc.) Workers trained in SWMS or referenced instructions.	3
	6. Angle grinder faulty and fire from sparks.	2	6. Maintain equipment. Test and tag as above. Operate in accordance with OEM requirements. Obtain Hot Works permit	3
	7. Structural Failure	1	7. Installation of all reinforcement and post tension elements to be compliant to the approved drawings, Australian Standards and manufacturer's requirements. Obtain Engineer's inspection certificate prior to concrete pour.	2
	8. Formwork collapse	1	8. Part deck handovers to allow access onto the formwork deck for other trades require a handover certificate from the formwork subcontractor supervisor to verify the structural integrity of the deck for other trades. Point load sign off/engineer's approval is required prior to landing loads onto the formwork deck.	2
	9. Fall from Heights	2	9. Comply with visual delineation/physical barriers i.e. handrail and "Formworkers only" signage or similar placed at least 2 meters from any live edge.	3
	10. Voids or penetrations not covered leading to falls or injuries from falling objects	1	10. Coordinate removal of a penetration cover with Lipman and or Formwork sub-contractor supervisor. Never leave an unprotected penetration unsupervised.	2
	11. Injuries form handling steel/metal objects	2	11. Use suitable hand protection when handling steel objects to protect against sharp edges, hot and or cold surfaces.	3
	12. Running Post Tension Coil	1	12. Coordinate with Lipman management the optimal travel path of the strand from the coil and create an exclusion zone with signage. Run the PT strand in a conduit/PT duct or similar.	2

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	13. Stressing concrete/Blow out	1	13. Obtain engineer's approval prior to stressing activity. Coordinate works with Lipman Management. Implement clear communications between stressing team. Establish an exclusion zone and leave in place for at least 30 minutes after stressing.	2
Reo. / Steel Fixing and Post Tensioning (Continued)	14. Exposure to hazardous substances (Including silica dust)	1	14. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	15. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	15. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Placing Concrete (Including rectification works)	1. Trips and falls	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan and *COP – Managing Risks of Plant in the Workplace. COP – Managing Risks of hazardous Chemicals in the Workplace.* 1. Maintain clear access and working areas.	2
	2. Injuries from use of powered equipment.	1	2. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. -Use ticketed operators. Inspection, testing and maintenance of concrete placing equipment must be carried out in accordance with the manufacturer's requirements. Where the manufacturer's requirements are not available, the recommendations of a competent person must be followed. Inspection, testing and maintenance must be undertaken by appropriately competent persons at designated intervals. Ensure concrete placing equipment is sited to ensure appropriate approach distances are maintained for overhead powerlines, pedestrian exclusion zones can be established and maintained around the equipment, and the risk of collision with structures is minimised so far as reasonably practicable. Use traffic management controls and/or spotters where necessary.	2

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Placing Concrete (Including rectification works)	3. Fire when re-fueling portable equipment.	1	3. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2
	4. Concrete boom pump overturning (ground instability, over balancing)	1	4. Establish setup area as per site plan. Project management team to survey work area for underground services (Dial before you dig 1100). Project management team to obtain Geotech report for ground stability and issue to subcontractor. Obtain plant operator competency certificates. Provide Site Plan layout to the operator of the concrete boom pump identifying location for the pump to be setup and operated.	2
	5. Boom Pumps not certified or maintained and operator competent	1	5. Obtain Item and Design registration for boom pumps. Obtain operator competency certificates for boom pumps. Ensure maintenance records are provided for pump and all associated equipment prior to work commencing. Obtain evidence of appropriate qualifications and/or VOC for Pump operator.	2
	6. Injury or illness caused by working in poor weather conditions	1	6. Re-schedule boom operations during lighting storms. Schedule pouring activities around forecasted clear weather reports. Provide wet weather clothing if commences during placement. Dewater access paths and provide safe access for workers.	2
	7. Manual handling injuries	2	7. *COP for Hazardous Manual Tasks*. Place concrete pumps as close to the work area as possible. Use concrete boom pumps where possible. Use multiple workers when manually moving lines. Workers trained SWMS or referenced instructions.	3
	8. Eye injuries and Skin irritations	2	8. Obtain and maintain SDS. *(Comply with COP - Managing Risks of Hazardous Chemicals in the Workplace*)	3
	9. Fumes from plant and equipment used on site	2	9. Plant and equipment not to be left running whilst not in use for extended periods.	3
	10. Excessive noise disturbance to workers and community	2	10. Monitor noise levels as per *Procedure 13 Noise Management*. Comply with DA Requirements. Refer to CEMP Appendix C2(k) Noise and Vibration Guidelines Refer to CEMP Appendix C2(k) Noise and Vibration Management Plan	3
	11. Exposure to hazardous substances (Including silica dust)	1	11. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Placing Concrete (Including rectification works (Continued)	12. Electrocution (booms working near overhead power lines).	1	12. Refer controls in 2 above. Contact the electricity authority on the proposed work and comply with any special conditions. Isolate lines where possible. Install tiger tails to power lines. Maintain minimum safe distance from overhead power lines as per *AS 2550-1 Safe Use of Cranes Section 6*. Implement *Procedure 25 Plant & Equipment*.	2
	13. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	13. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
	14. Concrete pumping activities from a public area	1	14. Where needed, ensure pedestrian and traffic control plan is approved and is reviewed periodically to maintain public safety. Implement SWMS and work specific emergency plan for traffic control. Traffic to be directed, in accordance with the work zone traffic management plan. Work zone traffic management plan/s are to be established and maintained using the nominated traffic control devices as per the approved plan. Traffic controllers must hold a current traffic control work training card or temporary card for the type of traffic control work being performed.	2
Formwork & Falsework	1. Falls from height	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan. 1. Provide safe access and perimeter fall protection. *COP – Formwork*. Assess the suitability and consider the use of or a combination of perimeter scaffold, mobile scaffold, elevated work platform and or platform ladder etc. Erect formwork equipment, frames and timber from the level below using working platforms. Any live edges must have full catch decks and or 2 planks to all exposed edges and progressively move them forward so they are always protected.	2
	2. Injuries from use of electrical equipment	1	2. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*.	2
	3. Injuries from use of Explosive Powered Tools.	1	3. Use competent operators. Setup exclusion zone and place signage around use of EPT's.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Formwork & Falsework (continued)	4. Formwork collapse.	1	4. Erect formwork in accordance with approved drawings. Obtain Engineers Certificate prior to pour (through ITPs). Conduct weekly Hazard Inspections on work areas. *COP - Formwork. AS 3610 Formwork for concrete*. Part deck handovers to allow access onto the formwork deck for other trades require a handover certificate from the formwork subcontractor supervisor to verify the structural integrity of the deck for other trades. Point load sign off/engineer's approval is required prior to landing loads onto the formwork deck. Visual delineation/physical barrier i.e. handrail and" Formworkers only" signage or similar is required at least 2 meters from any live edge. Conduct periodic inspections of handrail/delineation for suitability. Changes to the formwork design or installation to be approved by the formwork designer.	2
	5. Manual handling injuries	2	5. Comply with *COP - Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. crane, forklift, "Hiab", trolley etc.) Workers trained in SWMS or referenced instructions.	3
	6. Injury or illness caused by working in poor weather conditions.	1	6. Dewater working areas and access ways. Electrical tools not to be used in wet weather and cease work on/with conductive structures during lighting storms. Secure loose materials in windy conditions.	2
	7. Failure to formwork shutters lifting lugs	1	7. Inspect lifting lugs prior to lift. Obtain engineers certificate for the SWL and lifting points.	2
	8. Plant & Equipment failure during loading and unloading of materials.	1	8. Conduct Prestart and daily checks on plant. Maintain registers. Obtain competency records for operators. Refer "Use of Mobile Cranes" hazard categories for crane specific control measures. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*.	2
	9. Voids or penetrations not covered leading to falls or injuries from falling objects	1	9. Install void & penetration covers, secure and label to prevent inadvertent/unauthorised removal. Install in-cast mesh (max mesh gauge of 50x50mm) where practicable. Alternatively, fence off area to prevent access. Coordinate removal of the cover with Lipman and or Formwork subcontractor supervisor. Never leave an unprotected penetration unsupervised.	2
Formwork & Falsework (continued)	10. Fire when refuelling portable equipment.	1	10. *COP – Managing Risks of Hazardous Chemicals in the Workplace* - Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	11. Installation and use of vertical permanent formwork (e.g. Dincel/AFS etc)	1	11. Installation of permanent formwork and bracing/propping as per approved drawings and manufacturer's requirements. Obtain Engineer's Inspection Certificate prior to concrete pour to include adequacy of temporary supports, if any. Formwork subcontractor to supervise pour to monitor the condition of the wall structure and bracing during the concrete pour. Conduct periodic inspections of temporary supports. Bracing/propping only to be removed or modified upon engineer's approval.	3
	12. Installation and use of horizontal permanent formwork (e.g. Bondek structural steel decking etc)	1	12. Installation of permanent formwork and bracing/propping as per approved drawings and manufacturer's requirements. Obtain Engineer's Inspection Certificate prior to concrete pour to include adequacy of bracing or propping, if any. If the bracing or propping is not visible once the structure is to be complete, the formwork subcontractor is to arrange for the pre pour engineer's inspection to be conducted prior to the structure being fully enclosed to allow for a visual inspection. Implement the hot works permit system if cutting bondek. Use hand protection when handling sharp edges.	3
	13. Installation and use of handrails	1	13. Proprietary system perimeter handrails to be installed as per manufacturer's requirements. Installation and inspection by Formwork subcontractor and Lipman supervisor prior to and included in the formwork deck handover to Lipman. Conduct periodic inspection of handrails for suitability and adequacy.	3
	14. Temporary access to formwork decks	1	14. Temporary access to formwork decks via straight ladders is allowed until permanent access is available. The ladder is to be secured at the top and bottom. The top of the ladder must extend 1 meter past the work platform. Visual delineation/physical barrier i.e. handrail and "Formworkers Only" signage or similar is required at the top of the ladder. Maintain clear access around the ladder at all times. Conduct periodic inspections of the access, handrail/delineation for suitability.	3
Formwork & Falsework (continued)	15. Stripping formwork	1	15. Stripping of formwork to be conducted in accordance with approved drawings. Obtain Engineers approval prior to stripping activities commencing (through ITPs). Stripping shall be carried out in a controlled and planned manner that ensures the gradual transfer of load, from the formwork or the formwork supports, to the permanent structure or existing structure. Exclusion zone to be established in the stripping area. Establish an emergency response plan and provisions, access/egress and adequate lighting for the activity. Conduct periodic Hazard Inspections of work areas. No drop stripping	3
	16. Exposure to hazardous substances (Including silica dust)	1	16. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	17. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	17. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Erection use and dismantling of Scaffold	1. Scaffold Collapse	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan. 1. Scaffold design, erection, maintenance, altering and dismantling to comply with *AS 1576 Scaffolding General Requirements & SWA Scaffolds and scaffolding work general guide*. . Obtain Scaffold Plan from a competent scaffold designer for scaffolding which is designed outside the above guidelines. Obtain Engineer's certificate(s) and or revised scaffold plan for scaffolding erected/modified outside the requirements of the guidelines above. Obtain monthly inspection checklists. Prior to conducting any scaffolding activities, obtain advise from an engineer regarding the suitability of the ground to support the proposed structure. A ticketed scaffolder shall build scaffolding where there is a risk of a person or object falling 4m or more. A competent person shall build Scaffolds where there is a risk of fall less than 4m All Scaffolding components are inspected prior to erection to assess the overall condition including the surface coatings to prevent corrosion, welds, fabrication issues and need for further maintenance. Regular inspections must also be undertaken of the Scaffold: • Before first use • Prior to use after an incident or repair • After adverse weather that could affect Scaffolding integrity or stability and • At regular intervals not exceeding 30 days. Scaffold Coordinator to check and control access to working decks as *per Procedure 25 Plant & Equipment*. Conduct weekly Hazard Inspections on scaffolding.	2
	2. Ignition of containment netting / shade cloth	1	2. Obtain from scaffold supplier results of ignitability, flame propagation, flammability, or smoke release testing and analysis in relation to the proposed containment netting. Ensure that the amount of combustible materials placed on scaffolds are minimized as far as reasonably practicable. Ensure that any spillages of combustible or flammable liquids onto containment netting are reported immediately and that affected sections are replaced.	2

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	3. Incomplete scaffolding	1	3. Obtain handover certificate upon completion and prior to use. Ensure barriers and or signage are in place to prevent unauthorised access to incomplete scaffold.	2
Erection use and dismantling of Scaffold (Continued)	4. Falls from height	1	4. Handrails in place around unprotected edges. *COP - Managing the Risk of Falls at Workplaces. AS/NZS 1576 – Scaffolding, AS/NZS 4576 – Guidelines for scaffolding, AS/NZS 1892.5:2000 Portable ladders selection, use and care.* Scaffold to be erected and dismantled with fully planked decks at 2 metre intervals. Handrails and mid-rails in place before erecting or dismantling scaffold. Install access ways, stairs and or ladders as scaffold progresses. Provide fall protection AS 1891 Industrial fall-arrest systems and devices. COP –Managing the Risks of Falls in the Workplace, if using fall restraint/fall arrest systems during the work.	2
	5. Objects falling from scaffold / working decks	1	5. Secure equipment and tools whilst working at heights. Provide mesh/screening/kickboards as required. Establish exclusion zones as required.	2
	6. Trips	1	6. Maintain clear access and working decks.	2
	7. Injury or illness caused by working in poor weather conditions.	1	7. Check for frost/ice on working surfaces and remove prior to working. Electrical tools not to be used in wet weather. Cease work on/with conductive structures during lighting storms. Secure loose materials and cease work in high wind conditions.	2
	8. Manual handling injuries.	2	8. Comply with *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. crane, forklift, "Hiab", trolley etc.) Workers trained in SWMS or referenced instructions.	3
	9. Electrocution (erecting/dismantling near overhead power lines).	1	9. Isolate lines where possible. Install tiger tails to power lines. Maintain minimum safe distance from overhead power lines (4m conductive material). Install non-conductive material (e.g. ply) to scaffold.	2
	10. Plant & Equipment failure during loading and unloading of materials.	1	10. Conduct Prestart and daily checks on plant. Maintain registers. Obtain competency records for operators. Refer "Use of Mobile Cranes" hazard categories for crane specific control measures. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment.*	2
	11. Exposure to hazardous substances (Including silica dust)	1	11. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	12.		12.	

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Erection use and dismantling of Scaffold (Continued)	13. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	13. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Bricklaying/Blockwork	1. Falls from height	1	Subcontractor to Implement controls as per approved SWMS. 1. Provide fall protection (e.g. Scaffolding), COP - Managing the Risk of Falls at Workplaces.	2
	2. Injuries from use of Explosive Powered Tools.	1	2. Use competent operators as required. EPT signage, exclusion zones established	2
	3. Injuries from use of plant & equipment (e.g. noise, eye injuries, irritations from cement, use of forklifts etc.)	1	3. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer Procedure 25 Plant & Equipment. -Check testing and tagging is current as per AS NZS 3012 Electrical installations - Construction & demolition sites. Obtain and maintain SDS. Establish and maintain exclusion zones around mobile plant (e.g. forklift). Operators of mobile plant to be competent.	2
	4. Injury or illness caused by working in poor weather conditions.	1	4. Reschedule activities during rain. Do not operate electrical equipment (mixers cutters etc.) in rain. Inspect equipment after rain and before use. Dewater access paths and provide safe access for workers.	2
	5. Manual handling injuries.	2	5. COP for Hazardous Manual Tasks. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. crane, forklift, material hoists, trolley etc.). Workers trained in SWMS or referenced instructions.	3
	6. Slip and Trip injuries.	2	6. Maintain clear access and working areas.	3
	7. Fumes from plant and equipment used on site	2	7. Plant and equipment not to be left running whilst not in use for extended periods.	3
	8. Fire when re-fuelling portable equipment.	1	8. COP – Managing Risks of hazardous Chemicals in the Workplace. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer Procedure 21 Hazardous Substances & Dangerous Goods for the storage of fuel containers on site.	2

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Bricklaying/Blockwork (Continued)	9. Inadequately secured masonry brick or block walls leading to collapse.	1	9. Prior to construction identifying walls that will need temporary support during construction and include temporary support locations and designs in the construction drawings. Proprietary items to be installed in accordance with manufacturer's requirements. Sequencing construction so that masonry walls are constructed at the same time as cross walls or returns so they provide lateral support to each other. This may limit the amount of temporary bracing required. Limiting the height of each lift to avoid overloading green masonry. Providing additional temporary support for lintels or other structural elements that place concentrated loads onto green masonry. Avoid placing lateral loads on walls not yet secured into the structure, i.e. - do not lean materials against the walls. When extreme weather is imminent, cease work in the area of incomplete wall structures, prop walls if possible and establish an exclusion zone.	2
	10. Exposure to hazardous substances (Including silica dust)	1	10. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	11. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	11. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

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Electrical work	1. Electrocution/Electric Shock	1	Subcontractor to Implement controls as per approved SWMS and *COP – Managing Electrical Risks in the Workplace. COP – Managing Risks of hazardous Chemicals in the Workplace* 1. Provide licensed electrician to conduct or supervise all electrical wiring works. Conduct inspection of the project works with Site Manager/Supervisor prior to commencement of building works. Complete "*Pre-Commencement Checklist*" with Site Manager/Supervisor (Refer *Procedure 20 – "Electrical"*). Review project risk assessment and update as required. Isolate building/areas under Isolation of Services permit (Refer *Procedure 45 – Work Permits*). Personal Locks to be used to isolate switches, tags alone are not acceptable. Remove, terminate or cap off all exposed existing wiring on refurbishment Projects. Provide temporary power and label all wiring in accordance with *AS NZS 3012 Electrical installations - Construction & demolition sites* and project management teams requirements ("Danger - Live Power" Signage positioned every 5m along wiring and on each temp. board). Provide earth leakage protection on electrical supply and installations. Conduct handover inspection with Site Manager/Supervisor prior to turning on main/permanent power to the building. Complete "*Pre-Energising Checklist*" Checklist with Site Manager/Supervisor Refer *Procedure 20 – "Electrical Safety"*. Electrical Contractors are to comply with all State "Certificate of Compliance for Electrical Work" (NSW-CCEW)" or "Certificate of Testing and Compliance" (QLD) requirements including system verification (inspection & testing), recording of test values and notification to all required parties.	2
	2. Falls (into trenches/pits, off ladders etc.)	1	2. Provide fall protection (e.g. Scaffolding, handrails, barricades)	2
	3. Injuries from use of electrical equipment	1	3. Implement *Procedure 20 Electrical Safety* -Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*, *AS 3000 Wiring Rules*	2
	4. Injury or illness caused by working in poor weather conditions.	1	4. Electrical tools not to be used in wet weather, ensure temporary electrical distribution boards are waterproof & secured in place and cease work on/with conductive structures/material during lighting storms.	2
	5. Slip and trips	2	5. Maintain clear access and working areas.	3
	6. Manual handling injuries (pulling cables etc.)	2	6. *COP for Hazardous Manual Tasks*. –Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. winch). Workers trained in SWMS or referenced instructions.	3
	7. Exposure to hazardous substances (glues)	2	7. Obtain and maintain SDS. Use less hazardous products if possible. Comply with SDS. Store in suitable storage areas.	3

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Electrical work (Continued)	8. Fire when refuelling portable equipment.	1	8. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2
	9. Exposure to hazardous substances (Including silica dust)	1	9. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	10. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	10. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Plumbers work (E.g. working on or establishing services, guttering/drainage, etc.)	1. Electrocution	1	Subcontractor to Implement controls as per approved SWMS. *COP – Managing Risks of hazardous Chemicals in the Workplace* 1. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & Demolition sites*. Provide earth leakage protection on portable generators.	2
	2. Injuries from use of plant & equipment	1	2. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. - Obtain competency records for operators. Obtain relevant work permits from Site Manager/Supervisor. Establish and maintain exclusion zones.	2
	3. Fall from heights (e.g. ladders, mobile scaffolds etc.)	1	3. Provide fall protection. *COP –Managing the Risks of Falls at Workplaces*.	2
	4. Fire from hot works.	1	4. Obtain hot work permit prior to work commencement. *COP – Welding Processes*.	2
	5. Exposure to hazardous substances (glues)	2	5. Obtain and maintain SDS. Use less hazardous products if possible. Comply with SDS. Store in suitable storage areas.	3
	6. Exposure to biological hazards (sewer)	1	6. Implement controls as per SWMS (PPE, Immunisation etc.)	2

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Plumbers work (Continued)	7. Fire when refuelling portable equipment.	1	7. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2
	8. Pollution of waterways with sediment, soil or other site refuse run off from site into storm water.	2	8. Erosion and sediment controls in place, maintained. Locate stockpiles away from footpaths or other areas that may lead to discharge into storm water. Inspect erosion and sediment controls weekly and after rainfall. Divert clean water runoff around the construction area. Backfill trenches as work progresses. Comply with DA Requirements.	3
	9. Fumes from plant and equipment used on site	2	9. Plant and equipment not to be left running whilst not in use for extended periods.	3
	10. Odours generated from accessing sewer chambers and pipe work.	2	10. Cover sewer access chambers and pipe work when not in use.	3
	11. Explosion when pressure testing pipes	1	11. Use Hydrostatic pressure testing pipe systems, using water or other suitable fluid.	2
	12. Using Mobile Plant in Crane Mode	1	12. Do not exceed manufacture's specifications. Ensure the rated lifting capacity will be the maximum load that can be safely handled at the maximum lift radius without strength and stability devices. All lifting points must form a closed eye to which a load rated shackle can be attached, and each lifting point must be tested. Burst protection must be fitted to all mobile plant used as a crane. Operators must be trained to use the particular equipment they are required to use. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*.	2
	13. Exposure to hazardous substances (Including silica dust)	1	13. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Plumbers work (Continued)	14. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	14. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
	15. Isolations to existing services not carried out leading to injury.	1	15. Positively locate above and in ground services using non-destructive and vacuum pot holing methods in addition to Dial before you dig 1100. Place barriers, flagging and/or signage on surface along the path of the services. Issue services location plan to all operators. COP - Work Near Underground Assets. Isolate before excavation where possible. Contact the relevant authority on the proposed work and comply with any special conditions. Obtain isolation work permit from Site Manager/Supervisor. Install tiger tails to power lines. Maintain minimum safe distance from overhead power lines.	2
Core Drilling / Saw Cutting	1. Unplanned Electrical Contact, electric shock	1	1. Ensure services are isolated, with isolation points identified where practical. Ensure services remaining live are appropriately identified and protected or exclusion zones established. Obtain Drill/Core/Cut permit from Site Manager/Supervisor.	2
	2. Contact with stressing tendons or other obstructions	1	2. Refer to "as built' drawings prior to set out to ensure location of services and/or stressing tendons. Obtain Drill/Core/Cut permit from Site Manager/Supervisor. Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
	3. Cores - Materials falling	1	3. Barricade exclusion zone directly beneath coring area. Spotter to remain on the floor below until coring is complete. Where cutting vertical elements which may result in fall from height risk, ensure fall prevention measures are established prior to cutting.	3

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Core Drilling / Saw Cutting (Continued)	4. Exposure to hazardous substances (including silica dust)	1	4. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Isolate and signpost the area to avoid exposure to others. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required.	2
	5. Manual Handling Injuries	2	5. COP for Hazardous Manual Tasks. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. crane, forklift, material hoists, trolley etc.). Workers trained in SWMS or referenced instructions.	3
	6. Injuries from use of plant & equipment (e.g. noise, eye injuries, irritations from cement, use of road saws etc.)	2	6. Conduct Prestart and daily checks on plant. Refer Procedure 25 - "Plant & Equipment". -Check testing and tagging is current as per AS NZS 3012 Electrical installations - Construction & demolition sites. Establish and maintain exclusion zones around mobile plant (e.g. road saw). Ensure appropriate PPE e.g. ear, eye and respiratory protection as applicable.	3
	7. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	7. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Working on or installing Air Conditioning (E.g. ducting, A/C units, chillers etc.)	1. Electrocution	1	Subcontractor to Implement controls as per approved SWMS. 1. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Provide earth leakage protection on portable generators.	2
	2. Fall from heights (ladders, mobile scaffolds etc.)	1	2. Provide fall protection. *COP - Managing the Risks of Falls at Workplaces.*	2
	3. Manual handling injuries (e.g. moving equipment)	2	3. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. "Genie" lift, crane, forklift, material hoists, trolley etc.). Use multiple workers to manually lift ducting. Workers trained in SWMS or referenced instructions.	3
	4. Injuries from use of plant & equipment	1	4. Maintain plant and equipment, registers and checklists. Refer controls measures for Mobile Cranes and Tower Cranes above.	2
	5. Fire caused by grinding	1	5. Obtain hot work permit prior to work commencement. *COP – Welding Processes.*	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Working on or installing Air Conditioning	6. Exposure to hazardous substances (Including silica dust)	1	6. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	7. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	7. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Working with MDF (E.g. Activities involving cutting, drilling, sanding etc. of particle or fibre board products on site. Includes products such as MDF, particle board and chipboards.)	1. Exposure to wood dust causing: • Irritation wood dust of lungs – reduced lung capacity, • Skin allergies – dermatitis, • Eye irritation, • Asthma, • Increased risk of cancer; nasal, larynx, lung.	1	Implement SWMS and work specific emergency plan for working with MDF. Workers to be trained in and comply with approved SWMS. 1. Obtain and implement SDS recommendations. Pre-cut, off-site to minimize cutting on site. Wash face and hand s prior to eating. Cut MDF products in designated cutting room. Provide signage (no unauthorized entry), exhaust ventilation (away from other workers or public), close door at all times, install dust collection bag on the power cutting tools, vacuum work area or wet sweep daily, double bag and sealed dust prior to disposal in site bin.	2
	2. Exposure to formaldehyde vapour leading to • Irritation to the nose, throat, eyes & skin, • Respiratory illness, • Asthma, • Cancer (long term exposure).	1	2. Purchase low hazardous products where possible. Australian made MDF product labelled Australian made LFE = low formaldehyde emission. Keep away from sources of heat, flame or sparks. Use sharp tools to avoid burning/overheating of materials.	2
	3. Waste products leaching chemicals into the environment.	2	3. Dispose as trade waste in accordance with local authority guidelines.	3
	4. Exposure to hazardous substances (Including saw dust/silica dust)	1	4. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

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Cutting of Compressed Fibre Cement (CFC) sheeting and engineered stone products.	1. Exposure to hazardous substances (including silica dust)	1	1. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required.	2
	2. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	2. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

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Structural Steel and Riggers	1. Falls from heights	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan. 1. Provide fall protection *AS 1891 Industrial fall-arrest systems and devices. COP –Managing the Risks of Falls in the Workplace.* Assess the suitability and consider a combination of using perimeter scaffold, mobile scaffold, elevated work platform and or platform ladder etc.	2
	2. Falling objects/materials	1	2. Fence/barricade around work area. Establish exclusion zones as required	2
	3. Slip and trips	1	3. Maintain clear access and working areas	2
	4. Injuries from use of plant & equipment including cranes	1	4. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. Refer controls measures for Mobile Cranes and Tower Cranes above. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Obtain licenses/tickets	2
	5. Injury or illness caused by working in poor weather conditions.	1	5. Electrical tools not to be used in wet weather and cease work on/with conductive structures during lighting storms. Ground stability to be checked after heavy rains when using mobile cranes. Re-schedule crane operations in windy conditions.	2
	6. Manual handling injuries	2	6. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. crane, forklift, etc.) Workers trained in SWMS or referenced instructions.	3
	7. Fumes from plant and equipment used on site.	2	7. Plant and equipment not to be left running whilst not in use for extended periods.	3
	8. Fire from hot works.	1	8. Obtain hot work permit prior to work commencement. *COP – Welding Processes*.	2
	9. Plant & Equipment failure during loading and unloading of materials.	1	9. Conduct Prestart and daily checks on plant. Maintain registers. Obtain competency records for operators. Refer "Use of Mobile Cranes" hazard categories for crane specific control measures. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*. Establish an exclusion zone around the work zone.	2
	10. Exposure to hazardous substances (Including silica dust)	1	10. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required.	2

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Structural Steel and Riggers	11. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	11. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

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Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Roofing (installing sunscreens, louvers, roof sheeting, safety mesh, insulation, roof tiles etc.)	1. Falls from heights	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan. 1. Provide fall protection. *AS 1891 – Industrial fall-arrest systems and devices. COP Managing the Risks of Falls at Workplaces.* Assess the suitability and consider the use of or a combination of perimeter scaffold, mobile scaffold, elevated work platform and or platform ladder etc. to install roof access mesh. Prior to use, conduct a joint inspection with roofing sub-contractor supervisor and Lipman supervisor. Provide a roof mesh handover certificate to Lipman supervisor. Penetrations cut into the roof must keep the roof safety mesh in place. Roofing mesh to be cut out last, from below when the required item is ready to install.	2
	2. Falling objects	1	2. Isolate areas below/provide overhead protection.	2
	3. Injuries from use of plant & equipment	1	3. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. Use ticketed operators as required. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*	2
	4. Slips and trips	1	4. Maintain clear access and working areas.	2
	5. Unsafe access	1	5. Provide suitable access e.g. scaffold or fixed ladder, EWP, personnel hoist.	2
	6. Electrocution	1	6. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Provide earth leakage protection on portable generators. Maintain safe distance from overhead power lines (4m conductive material, 1.5m non-conductive).	2
	7. Sun glare and UV exposure	1	7. Wear required PPE and limit exposure where possible.	2
	8. Injury or illness caused by working in poor weather conditions.	1	8. Check for frost/ice on working surfaces and remove prior to working. Electrical tools not to be used in wet weather and cease work on/with conductive structures during lighting storms. Secure loose materials and cease work in high wind conditions.	2
	9. Fumes from plant and equipment used on site	2	9. Plant and equipment not to be left running whilst not in use for extended periods.	3
	10. Exposure to hazardous substances (Including silica dust)	1	10. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

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Roofing	11. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	11. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Gyprock,Plastering and Hebal Wall Installation			Subcontractor to Implement controls as per approved SWMS and work specific emergency plan.	
	1. Falls from height	1	1. Provide fall protection. *COP –Manage the Risks of Falls at Workplaces.*	2
	2. Injuries from use of plant & equipment	1	2. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. Use ticketed operators as required. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2 and Procedure 25 Plant & Equipment*	2
	3. Slips and trips	1	3. Maintain clear access and working areas.	2
	4. Exposure to dust when mixing and sanding plaster.	2	4. Comply with SDS. (Comply with *COP - Managing Risks of Hazardous Chemicals*) Provide washing facilities for equipment/tools.	3
	5. Fire from grinding	1	5. Obtain hot work permit prior to commencing work. *COP – Welding Processes.*	2
	6. Manual handling injuries	2	6. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. crane, forklift, material hoists, trolley etc.) Use multiple workers to manually lift sheets. Workers trained in SWMS or referenced instructions.	3
	7. Spilling contaminated water into drains (when cleaning equipment)	2	7. Provide wash down areas (as per Subcontract agreement)	3
	8. Exposure to hazardous substances (Including silica dust)	1	8. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

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Gyprock,Plastering and Hebal Wall Installation	9. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	9. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Window Fixing and Glazing			Subcontractor to Implement controls as per approved SWMS and work specific emergency plan.	
	1. Falls from height	1	1. Provide fall protection. *COP –Managing the Risks of Falls at Workplaces.*	2
	2. Injuries from use of plant & equipment	1	2. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. Refer controls measures for Mobile Cranes and Tower Cranes above. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Use ticketed operators as required. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*	2
	3. Injury or illness caused by working in poor weather conditions.	1	3. Reschedule activities during heavy rain. Provide wet weather gear for intermittent rain. Dewater access paths and provide safe access for workers. Provide warm clothing during winter.	2
	4. Working in windy conditions.	1	4. Cease work in high wind conditions. Secure loose materials. Reschedule crane operations in windy conditions. Refer to "Use of Mobile Cranes" hazard controls	2
	5. Injuries from poor storage and un-packing practices.	1	5. Provide adequate storage area for crates or glass sheets to allow access for workers and lifting equipment. Store and secure glass sheets on an angle using an A frame or other appropriately. Store and secure crates on an A frame or with appropriate chock wedging to prevent crate from overbalancing. Do not unpack crates which are not on an A frame or a lean. Assess the crates/packaging for damage before unpacking. Remain clear of fall zone and strap recoil when unpacking glass.	2
	6. Slips and trips	2	6. Maintain clear access and working areas.	3
	7. Cuts	2	7. Wear appropriate PPE and conduct work as per SWMS	3
	8. Manual handling injuries	2	8. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical devices to move glass where possible. Use appropriate lifting devices and restraints. Only lift using safe lifting points identified on package. *COP for Hazardous Manual Tasks*. Use multiple workers to manually lift sheets. Workers trained in SWMS or referenced instructions.	3

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Window Fixing and Glazing (Continued)	9. Exposure to hazardous substances (Including silica dust)	1	9. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	10. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	10. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

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Installing Lifts	1. Falls from height	1	Subcontractor to Implement controls as per approved SWMS. 1. Install lift cages or fully enclose lift opening. *COP - Managing the Risks of Falls at Workplaces.*	2
	2. Electrocution	1	2. Isolate electrical power. Obtain isolation permit from Site Manager/ Supervisor.	2
	3. Power failure to work area	2	3. Ensure communication equipment is available (phone)	3
	4. Injuries from use of equipment	1	4. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*	2
	5. Exposure to hazardous substances (Including silica dust)	1	5. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	6. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	6. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Rendering	1. Falls from height	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan. 1. Provide fall protection. *COP –Managing the Risks of Falls At Workplaces.*	2
	2. Injuries from use of plant & equipment	1	2. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment.* Use ticketed operators as required. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites.*	2
	3. Slips and trips	2	3. Maintain clear access and working areas.	3
	4. Manual handling injuries	2	4. *COP for Hazardous Manual Tasks.* Use mechanical means where possible (e.g. material hoist, wheelbarrow etc.). Workers trained in SWMS or referenced instructions.	3
	5. Exposure to dust and contact with cement and lime when mixing.	2	5. Comply with SDS. (Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace.*)	3
	6. Spilling contaminated water into drains (when cleaning equipment)	2	6. Provide washing facilities for equipment/tools.	3
Rendering (Continued)	7. Fumes from plant and equipment used on site	2	7. Plant and equipment not to be left running whilst not in use for extended periods.	3

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	8. Exposure to hazardous substances (Including silica dust)	1	8. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	9. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	9. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Tiling	1. Injuries from use of equipment	1	Subcontractor to Implement controls as per approved SWMS. 1. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*.	2
	2. Slips and trips	2	2. Maintain clear access and working areas.	3
	3. Exposure to hazardous substances (sealants, adhesives).	2	3. Obtain and comply with SDS. (Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace*). Use less hazardous products if possible. Store in suitable storage areas.	3
	4. Manual handling injuries	2	4. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. crane, forklift, material hoists, trolley etc.). Workers trained in SWMS or referenced instructions.	3
	5. Spilling contaminated water into drains (when cleaning equipment)	2	5. Provide washing facilities for equipment/tools.	3
	6. Exposure to hazardous substances (Including silica dust)	1	6. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Tiling	7. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	7. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Installing Doors and Hardware	1. Injuries from use of equipment	1	Subcontractor to Implement controls as per approved SWMS. 1. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*.	2
	2. Exposure to dust from sawing/drilling etc (MDF)	2	2. Obtain and comply with SDS. (Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace*). Use less hazardous products if possible. Provide cutting room/area (where MDF is to be cut indoors)	3
	3. Manual handling injuries	2	3. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use two workers to carry solid core door. Use mechanical means where possible (e.g. trolley etc.). Workers trained in SWMS or referenced instructions.	3
	4. Exposure to hazardous substances (Including silica dust)	1	4. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	5. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	5. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Landscaping	1. Injuries from use of plant & equipment	1	Subcontractor to Implement controls as per approved SWMS. 1. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. Obtain competency records for operators. Obtain relevant Work Permits including Excavation Permit from Site Manager/ Supervisor. Operators are to follow the Site Vehicle Movement Plan	2
	2. Exposure to hazardous substances (fertilizers)	2	2. Comply with SDS. (Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace*). Use less hazardous products if possible. Store in suitable storage areas.	3
	3. Sun glare and UV exposure	2	3. Wear required PPE and limit exposure where possible.	3
	4. Manual handling injuries	2	4. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. wheelbarrow, forklift, trolley etc.) Workers trained in SWMS or referenced instructions.	3
Landscaping (Continued)	5. Generating dust	2	5. Reprogram activities during strong winds. Dampen areas. Cover stockpiles.	3

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	6. Public Domain works.	2	6. Obtain approval from Council for a barricade. Permit to use footpaths or roads. *Local Government Act 1993*. All public protection issues are to follow *Project Plan* procedures.	3
	7. Pollution of waterways with sediment, soil or other site refuse run off from site into storm water.	2	7. Erosion and sediment controls in place and maintained. Locate stock piles away from footpaths or other areas that may lead to discharge into storm water. Comply with DA Requirements. Inspect erosion and sediment controls weekly and after rainfall. - Divert clean water runoff around the construction area. Backfill trenches as work progresses	3
	8. Fumes from plant and equipment used on site.	2	8. Plant and equipment not to be left running whilst not in use for extended periods.	3
	9. Injury or illness caused by working in poor weather conditions.	1	9. Secure loose materials at all times. Reschedule activities during heavy rain. Provide wet weather gear for intermittent rain. Do not operate electrical equipment (saws) in rain. Inspect equipment after rain and before use. Dewater access paths and provide safe access for workers. Provide warm clothing during winter.	2
	10. Fire from static electricity when laying synthetic turf.	1	10. Workers to wear non-nylon clothing. Review the type of clothing being worn by installers, Ensure gluing machine is earthed. Use non-flammable glues.	2
	11. Fire when refuelling portable equipment.	1	11. *COP – Managing Risks of hazardous Chemicals in the Workplace*. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2
	12. Exposure to hazardous substances (Including silica dust)	1	*12.* Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Landscaping (Continued)	13. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	13. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference. Refer to CEMP Appendix C2 (n) PRM Asbestos Management Plan	2
	14. Truck Movements	1	14. Where needed, ensure pedestrian and traffic control plan is approved and is reviewed periodically to maintain public safety. Implement SWMS and work specific emergency plan for traffic control. Traffic to be directed, in accordance with the work zone traffic management plan. Work zone traffic management plan/s are to be established and maintained using the nominated traffic control devices as per the approved plan. Traffic controllers must hold a current traffic control work training card or temporary card for the type of traffic control work being performed . Refer to CEMP Appendix C2 (j) PRM Traffic And Pedestrian Sub Plan	2
	15. Isolations to existing services not carried out leading to injury.	1	15. Positively locate above and in ground services using non-destructive and vacuum pot holing methods in addition to Dial before you dig 1100. Place barriers, flagging and/or signage on surface along the path of the services. Issue services location plan to all operators. COP - Work Near Underground Assets. Isolate before excavation where possible. Contact the relevant authority on the proposed work and comply with any special conditions. Obtain isolation work permit from Site Manager/Supervisor. Install tiger tails to power lines. Maintain minimum safe distance from overhead power lines.	2
Pest Control	1. Exposure to hazardous substances (poisons)	1	Subcontractor to Implement controls as per approved SWMS. 1. Comply with SDS. (Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace*). Use less hazardous products if possible.	2
	2. Spills into drains or soil	2	2. Store in suitable storage areas. Provide Spill kits protect drains. Reprogram spraying activities in windy conditions or during inclement weather.	3
Paving	1. Sun glare and UV exposure	1	Subcontractor to Implement controls as per approved SWMS. 1. Wear required PPE and limit exposure where possible.	2
	2. Injuries from use of plant & equipment	1	2. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. Use ticketed operators as required. Establish and maintain exclusion zones around mobile plant (e.g. forklift)	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
	3. Exposure to hazardous substances (acid wash, cement etc.)	2	3. Comply with SDS. (Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace*). Use less hazardous products if possible. Store in suitable storage areas.	3
	4. Generating dust	2	4. Reprogram activities during strong winds. Dampen areas.	3
Paving (Continued)	5. Public Domain works.	1	5. Obtain approval from Council for a barricade. Permit to use footpaths or roads. *Local Government Act 1993*. All public protection issues are to follow *Project Plan* procedures.	2
	6. Manual handling injuries	2	6. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. forklift, wheelbarrow, trolley etc.). Workers trained in SWMS or referenced instructions.	3
	7. Pollution of waterways with sediment, soil or other site refuse run off from site into storm water.	2	7. Erosion and sediment controls in place and maintained. Locate stockpiles away from footpaths or other areas that may lead to discharge into storm water. Inspect erosion and sediment controls weekly and after rainfall.	3
	8. Fumes from plant and equipment used on site	2	8. Plant and equipment not to be left running whilst not in use for extended periods.	3
	9. Injury or illness caused by working in poor weather conditions.	1	9. Secure loose materials at all times. Reschedule activities during heavy rain. Provide wet weather gear for intermittent rain. Do not operate electrical equipment (saws) in rain. Inspect equipment after rain and before use. Dewater access paths and provide safe access for workers. Provide warm clothing during winter	2
	10. Exposure to hazardous substances (Including silica dust)	1	10. Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	11. Fire when refuelling portable equipment.	1	11. *COP – Managing Risks of hazardous Chemicals in the Workplace*. Provide and maintain fire extinguisher(s). Turn portable equipment off and cool down before refuelling. Remove equipment from inside vehicles, trailers or surfaces (e.g. Plastic or rubber) to ground out static charge build up. Wear the appropriate PPE (Gloves, eye protection, Safety Boots etc.). Refuel in well ventilated area, away from heat & ignition sources. Use a funnel to reduce the risk of static electricity & fuel spillage. Refuel only from approved labelled fuel containers. When transporting fuel containers ensure fuel caps are on tight and secure in the upright position in a well-ventilated space. Refer *Procedure 21 Hazardous Substances & Dangerous Goods* for the storage of fuel containers on site.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Paving (Continued)	12. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	*12.* Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Waterproofing	1. Working in confined spaces	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan. 1. Comply with *WHS Regulations Part 4.3 Division 3 Confined Spaces* and *COP – Confined Spaces*. Confined space signage, permit/checklist, stand by person, air monitoring, training and monitoring access.	2
	2. Falling from heights	2	2. Provide fall protection. *COP - Managing the Risks of Falls At Workplaces*	2
	3. Injuries from use of equipment	2	3. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites.*	2
	4. Exposure to and injuries from hazardous substances (waterproofing membrane application)	2	4. Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace*. Use water-based alternatives where possible. Provide ventilation to keep the solvent vapours below the *Australian Exposure Standard (ES)*. Obtain and read SDS. to determine what PPE is necessary to prevent absorption, and what engineering controls are appropriate. Train workers on how to use PPE. For areas that are enclosed or partially enclosed, if possible, apply chemicals from outside the area using long-handled tools. Check work area to ensure there are no ignition sources when using solvents in an enclosed or partially enclosed area.	3
Metal Working/Balustrades	1. Falls from height	1	Subcontractor to Implement controls as per approved SWMS and *COP – Welding Processes*. 1. Provide fall protection. *COP - Managing the Risks of Falls At Workplaces*	2
	2. Injuries from use of equipment	1	2. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*. Register, inspect, maintain and use lifting equipment as per *AS 3775.2, AS 1353.2* and *Procedure 25 Plant & Equipment*.	2
	3. Fires from welding sparks	1	3. Maintain a clean work area and provide fire extinguisher. Obtain hot work permit prior to works. *COP – Welding Processes*.	2
	4. Exposure to Welding flash, and burns	2	4. Provide specific area for welding/fabrication work. Install welding screens	3
	5. Manual handling injuries	2	5. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. crane, forklift, material hoists, trolley etc.). Workers trained in SWMS or referenced instructions.	3

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Metal Working/Balustrades	6. Exposure to hazardous substances (Including silica dust)	1	*6.* Dry cutting of products containing crystalline silica with a power tool unless controls are in place is prohibited. Use a combination of a water delivery system that supplies a continuous feed of water over the area being cut to suppress the generation of dust, or an extraction system attached to the tool to capture the dust produced, or a ventilation system that captures the dust produced and transports it to a safe emission point, filter or scrubber and RPE which complies with AS/NZS 1716-2012, Respiratory protective devices, to be worn as per SDS and SWMS. Implement air monitoring, store and make records available when required	2
	7. Work involving the penetration into or through any existing finished floor, wall or ceiling surface where there is risk of contact or damage to and injury from existing services and structures (e.g. post tension cables)	1	7. Obtain Drill/Cut/Core permit from Site Manager/Supervisor prior to starting work. Assess if other work permits are required to complete the activity safely (i.e Hot Works Permit, Isolation Of Services Permit, Excavation Permit, Working At Heights permit, Confined spaces permit). Ensure live services are isolated or appropriately identified, protected or exclusion zones established prior to work. Engage a service locator provider to positively identify live or existing services ensuring all power sources including intermittent power is active during the service locating activity. Consider the limitations of service location equipment used in relation to the environment and potential interference.	2
Painting	1. Falls from height	1	Subcontractor to Implement controls as per approved SWMS and work specific emergency plan. 1. Provide fall protection. *COP –Managing the Risks of Falls At Workplaces*	2
	2. Injuries from use of plant & equipment	1	2. Conduct Prestart and daily checks on plant. Maintain registers and checklists. Refer *Procedure 25 Plant & Equipment*. Use ticketed operators as required. Check testing and tagging is current as per *AS NZS 3012 Electrical installations - Construction & demolition sites*.	2
	3. Exposure to hazardous substances (paints, thinners etc)	2	3. Comply with SDS. (Comply with *COP - Managing Risks of Hazardous Chemicals*). Use less hazardous products if possible. Store in suitable storage areas.	3
	4. Working in enclosed areas without proper ventilation (e.g. basement) being exposed to fumes, vapours, odours, etc.	1	4. Provide sufficient ventilation through portable and fixed fans (where available) Refer *Procedure 21 - Hazardous Substances & Dangerous Goods,*	2
	5. Spilling contaminated water into drains (when cleaning equipment)	2	5. Provide washing facilities for equipment/tools.	3
Carpet Laying	1. Cuts	2	Subcontractor to Implement controls as per approved SWMS for working with/near powered mobile plant. 1. Maintain clear access and working areas. Wear appropriate PPE as per SWMS.	3
	2. Manual handling injuries	2	2. *COP for Hazardous Manual Tasks*. Store and move materials as agreed with Site Manager/Supervisor. Use mechanical means where possible (e.g. forklift, material hoists, trolley etc.). Workers trained in SWMS or referenced instructions	3
	3. Fire/explosion from glue fumes.	1	3. Ventilate rooms. Source alternate/non-flammable glues.	2

Hazard Categories/Activities	Site Specific Hazards Each hazard documented below must be given a risk class	Risk Class	Control Measures Detail actions required to mitigate or eliminate the risk, including legal and other requirements that need to be followed.	Residual Risk Class
Epoxy Flooring	1. Workers and nearby persons overcome with fumes.	1	Subcontractor to Implement controls as per approved SWMS. 1. Use low solvent chemicals. Implement all SDS controls and recommendations. Persons who have signed on the SWMS are allowed to access these areas whilst work is being conducted. Apply coating when workers have left site and there is no work planned for the next day. Provide adequate ventilation must be ducted to direct the fumes to an open area away from surrounding buildings and people. Operate ventilation or extraction fans for at least 1 full day after application. Where non and low toxic/hazardous substances cannot be used Air monitoring and testing is be conducted during application and prior to allowing access for person to carry out other activities. Put into place barricades and warning signs indicating necessary PPE and authorisation for access.	2
	2. Fire/explosion from glue fumes.	1	2. Ventilate rooms. Source alternate/non-flammable glues.	2
	3. Slip and trips	2	3. Maintain clear access and working areas. Wear appropriate PPE as per SWMS.	3
	4. Exposure to and injuries from hazardous substances (epoxy products).	2	4. Comply with *COP - Managing Risks of Hazardous Chemicals in the Workplace*. Obtain and read SDS to determine what PPE is necessary, and what engineering controls are appropriate. Train workers on how to use PPE. Check work area to ensure there are no ignition sources when using solvents in an enclosed or partially enclosed area. Use low solvent alternatives where possible. In enclosed areas, provide ventilation to keep the solvent vapours below the *Australian Exposure Standard (ES)*. Store in suitable storage areas.	3

Appendix A4 – Environmental Policy

ENVIRONMENTAL POLICY

LIPMAN
DESIGNED TO PERFORM · BUILT TO LAST

Lipman understands its core business has the potential to impact the environment.
Lipman is committed to maximising its positive impact and minimising the negative impact of its activities on the environment it influences through effective environmental solutions and pollution prevention. This shall be achieved through:

- Creating an environmentally responsible culture;
- Providing people with appropriate training and consultation that enable them to make a positive contribution to the environment;
- Compliance with ISO 14001, applicable environmental regulations and other requirements to which Lipman subscribes;
- Managing hazards and risks where our activities interact with, or impact on the environment;
- Establishing and monitoring measurable objectives and targets to identify environmental performance improvement;
- Subcontractors & Suppliers who share our values, and are committed to achieving our environmental objectives;
- Protecting the built environment by implementing environmentally responsible design; and
- Reviewing our system, policies, objectives and targets annually to ensure their continued suitability and appropriateness.

Lipman aims to make a positive contribution to the communities in which it works. Protecting and improving the environment through responsible planning and monitoring provides the foundation required for sustainability.

Robert MacKee
Chief Executive Officer

26 November 2018

Appendix A5 – Tree Protection and Removal Plan (Sensitive Area Plans)

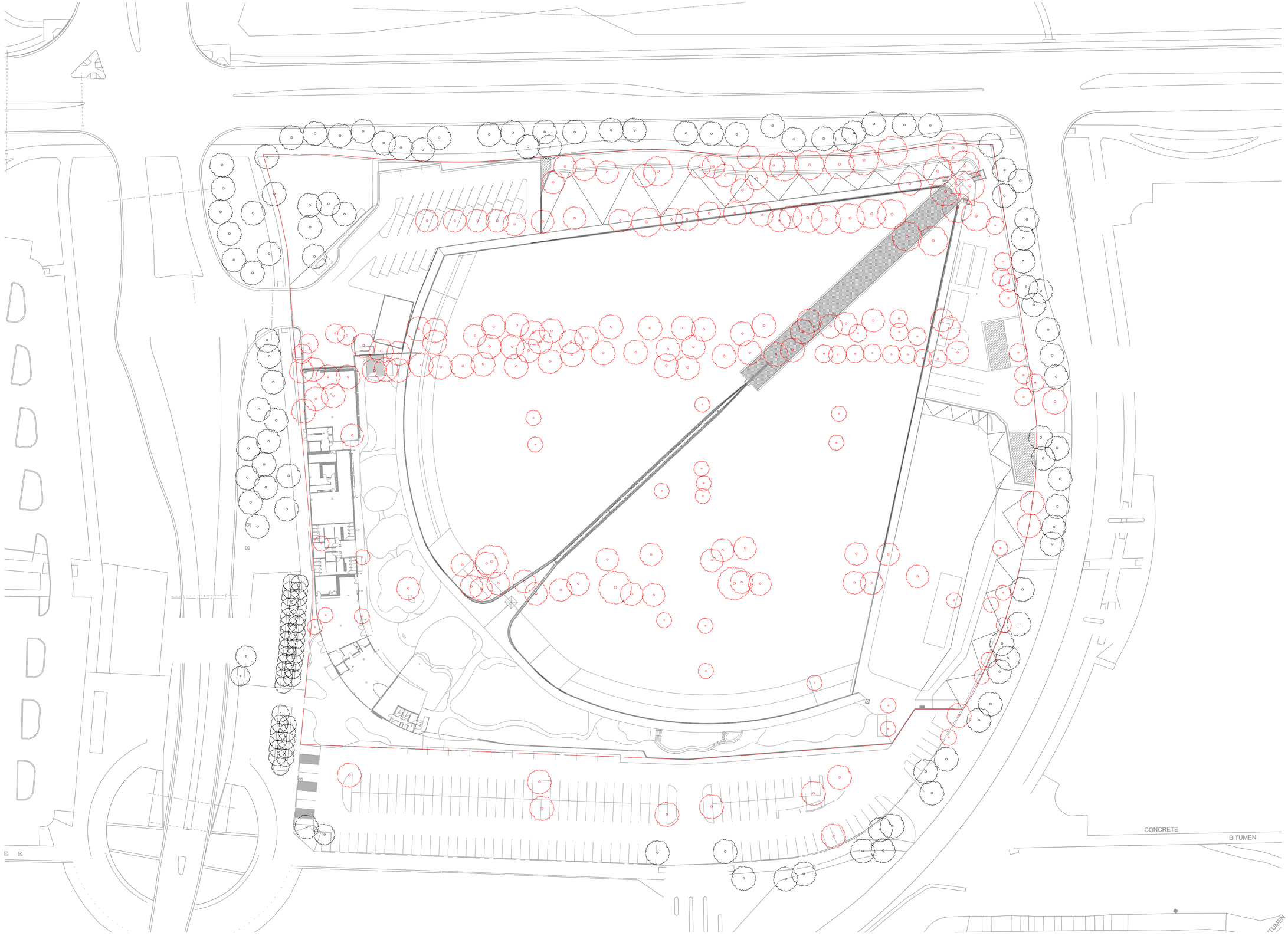
Tree Protection Plans are a development consent condition through the construction stage of the project and therefore the tree protection and removal plans will be provided for approval and developed in accordance with the following conditions:

a) no street trees are trimmed or removed unless it forms a part of this development consent
or prior written approval from SOPA is obtained or is required in an emergency to avoid the loss of life or damage to property;

b) all street trees not removed as part of this consent are protected at all times during construction. Any tree on the footpath, which is damaged or removed during construction
due to an emergency, shall be replaced, to the satisfaction of SOPA;

c) all trees on the site that are not approved for removal are to be suitably protected by way
of tree guards, barriers or other measures, are to be provided to protect root system, trunk
and branches, during construction; and

d) tree removal works are undertaken by a qualified arborist recognised within the Australian
Qualification Framework, with a minimum five years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works and in accordance with AS 4373:2007.



NOTES

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL LANDSCAPE SCHEDULES AND TECHNICAL SPECIFICATION AND OTHER CONSULTANTS DRAWINGS. CHECK AND VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO THE COMMENCEMENT OF ANY WORK. DO NOT SCALE DRAWINGS - REFER TO FIGURED DIMENSIONS ONLY. INFORM OCULUS OF ANY DISCREPANCIES FOR CLARIFICATION BEFORE PROCEEDING. UNLESS NOTED OTHERWISE THIS DRAWING IS NOT FOR CONSTRUCTION.

DIAL BEFORE YOU DIG www.1100.com.au

SERVICES SHOWN ON THIS DRAWING ARE APPROXIMATELY ONLY. THE EXACT LOCATION IS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO COMMENCEMENT WORK.

KEY PLAN

ISSUE	DATE	AMENDMENT	DRN	APRVD
A	10.03.21	ISSUE FOR S4.55	BJ	AK

OCULUS
level 1 / 5 wilson street, p.o. box 307, newtown, nsw 2042
p 02.9557.5533 australia@oculus.info
SYDNEY MELBOURNE WASHINGTON

PROJECT
URBN SURF SYDNEY
HILL ROAD, SYDNEY OLYMPIC PARK NSW

CLIENT
URBN SURF
LVL 2, 95 PITT STREET SYDNEY NSW 2000

ARCHITECT
CLARKE HOPKINS CLARKE
HOLT STREET, SURRY HILLS 2010

STATUS
S4.55
DEVELOPMENT APPLICATION

DRAWING SCALE
SCALE 1:500 @ A1
15 0 5 10 30m

NORTH POINT

DRAWING
TREE RETENTION AND REMOVAL PLAN

PROJECT № **S19-023**
SHEET SIZE **A1**
DRAWING № **L003**
ISSUE **A**

FILE PATH:P:\SYDNEY\S19-023 WAVE PARK URBN SURF\06. CONCEPT DESIGN\02. CAD DRAWINGS\01. SHEET SETS\OC_S19-023_000_INFORMATION.DWG; DATE PLOTTED:10/03/2021; PLOTTED BY:BRITTANY JOHNSTON

Appendix A6 – Incident Classification and Reporting Procedure

Reference Lipman Project Plan, and Risk Assessment with the use of Hammertech (blank forms attached)

Incident Summary

Reference	INC-62
Date Added	

Details of Person Completing Record

Incident Details

Status	

USER GUIDE

1. COLLECT THE EVIDENCE (Section 1, 2 and 5)

- What really happened?
- Obtain all relevant information.
- Get the facts.

2. CONSIDER THE EVIDENCE (Section 3)

- What are the reasons?
- Why did it actually happen?

3. RECOMMEND ACTIONS (Section 4)

- What action will be taken to prevent the problem from occurring again.

4. IMPLEMENT THE FINDINGS

• Take action.

• Monitor and check suitability.

5. CLOSE OUT (Section 6)

• Verify actions as complete and effective prior to closing out.

CATEGORISATION

• SERIOUS INCIDENTS (which are reportable to authorities)- Must Be Provided Within 24 Hours

• MINOR INCIDENTS – An unplanned event that has resulted in injury, damage or loss but are not regarded as Serious Incidents.

• MEDICAL TREATMENT injury/illness (excluding Serious Injuries) - Must Be Provided Within 3 Days

Incident Type	[Select Option]
Is Near Miss	◯ Yes ◯ No

Investigation

Appendix A7 – Environment Inspection Checklist

Reference Lipman Project Plan and Risk Assessment with the use of Hammertech (blank forms attached)

Inspection Details - Site Inspection Sheet

Inspection Status	Location	Description
In Progress		

Attendees

Name	Company	Position	Signature
Cameron Bowden	Lipman Group	Site Manager	

Checklists

Revision
Site Inspection Sheet - Form 4.2
Revision 9
Date: 30/04/2018

Checklists

Review Prompts		
Indicate areas/activities inspected or review even if no issues were found		
Emergency Response	○ Yes	○ N/A
Housekeeping	○ Yes	○ N/A
Noise/Vibration	○ Yes	○ N/A
Falls (Ladders, Scaffold)	○ Yes	○ N/A
Compressed Gases	○ Yes	○ N/A
Land (Flora & Fauna)	○ Yes	○ N/A
Access & Egress	○ Yes	○ N/A

Public Protection	Yes	N/A
Heritage	Yes	N/A
Electrical	Yes	N/A
Manual Handling	Yes	N/A
Air Quality	Yes	N/A
PPE	Yes	N/A
Work Permits	Yes	N/A
Erosion & Sediment Control	Yes	N/A
Plant & Equipment	Yes	N/A
Dangerous Goods & Hazardous Subst.	Yes	N/A
Excavation Work	Yes	N/A
Community	Yes	N/A
Waste	Yes	N/A
Water	Yes	N/A
Amenities	Yes	N/A

Checklists

SECTION 1: SWMS Review

Focus on High Risk Construction Work activities

Site Inspection Sheet - High Risk Work Table	
Company	
SWMS Title	
SWMS No.	
Revision	
Reviewed By	
SWMS has been reviewed and accepted by the Main Contractor	○ Yes ○ No
Take a copy of the current SWMS with you to review compliance on site	
Findings (Record your comments and finding)	
SWMS has been communicated to all workers in the workgroup (i.e. all person present have signed off on the SWMS).	○ Yes ○ No
Findings (Record your comments and finding)	
SWMS is being followed as documented.	○ Yes ○ No
Findings (Record your comments and finding)	
SWMS is current and up to date (i.e. reflects current hazards. Refer to above Review Prompts for further considerations)	○ Yes ○ No
Findings (Record your comments and finding)	

Checklists

SECTION 2: Hazard Inspection Guidance

For all persons that undertook the inspection, add in the below Attendees section.

A hazard inspection has been conducted in the areas and/or activities identified in the Review Prompts above

HAZARD GUIDE The prompts below are provided as a guide only and may not cover all the existing site hazards and activities.

For all sections which were not inspected, these can be removed by clicking on the cog to the right and selecting delete.

Checklists

SECTION 2: Amenities

Toilets are in a clean and sanitary condition	Compliant	Non-Compliant
Female toilets are available, as required	Compliant	Non-Compliant
The lunch room is clean, tidy and adequate for the number of workers	Compliant	Non-Compliant
The shower, wash and change rooms are clean & tidy	Compliant	Non-Compliant
There adequate supply of clean, fresh drinking water	Compliant	Non-Compliant
The amenities are in good repair (no leaks, secure, etc)	Compliant	Non-Compliant
Appliances and electrical equipment tested and tagged every 3 months	Compliant	Non-Compliant

Checklists

SECTION 2: First Aid

A first aid room is available (where there are 100 workers or more)	Compliant	Non-Compliant
There is a suitable first aid kit and is adequately stocked	Compliant	Non-Compliant
Qualified first aiders are identified beside each kit	Compliant	Non-Compliant
Kits are clearly visible/accessible	Compliant	Non-Compliant
An injury notification system (e.g. nurse call, radios etc) is in place and tested monthly	Compliant	Non-Compliant

Checklists

SECTION 2: Emergency Response Preparedness

Emergency response plan established, up to date and posted	Compliant	Non-Compliant

Sufficient and correct type of fire extinguishers provided [i.e. ABE dry chemical type]	○ Compliant	○ Non-Compliant
Fire extinguishers been tested every six months	○ Compliant	○ Non-Compliant
Signs indicating specific use of fire extinguishers in place	○ Compliant	○ Non-Compliant
Emergency evacuation system (Exelarm, air horns etc) are tested monthly	○ Compliant	○ Non-Compliant
Contact details of key personnel and authorities are posted	○ Compliant	○ Non-Compliant
There is easy access to fire fighting equipment	○ Compliant	○ Non-Compliant
Emergency service vehicles have clear access to the site	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Housekeeping

All work areas clean, tidy and free of obstructions or trip hazards	○ Compliant	○ Non-Compliant
General lighting is sufficient	○ Compliant	○ Non-Compliant
Storage areas are tidy	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Personal Protective Equipment

PPE is suitable for the task and being used correctly	○ Compliant	○ Non-Compliant
Hard hats, safety shoes and high visibility vests are worn	○ Compliant	○ Non-Compliant
Sunscreen is provided for personnel exposed to the sun	○ Compliant	○ Non-Compliant
PPE are worn as required by SWMS	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Falls (General)

Penetrations are secured, mesh covered and marked with instructions	○ Compliant	○ Non-Compliant
Fall arrest systems in use by trained workers	○ Compliant	○ Non-Compliant
Handrails in place	○ Compliant	○ Non-Compliant
Are fall prevention systems and structures are compliant	○ Compliant	○ Non-Compliant
Are handrail and/or other edge protection systems installed to relevant regulations and/or the original equipment manufactures specifications.	○ Compliant	○ Non-Compliant
Are catchdecks installed to relevant regulations	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Work Permits

Relevant work permit(s) have been issued for the work (e.g. Hot Work, Isolation, Excavation, Confined space).	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Compressed Gases

Bottles are stored upright and secured	○ Compliant	○ Non-Compliant
Cylinders are turned off at the bottle and not the regulator	○ Compliant	○ Non-Compliant
Storage is adequate and ventilated	○ Compliant	○ Non-Compliant
All cylinders are fitted with flashback arresters at the blow pipe and regulator end.	○ Compliant	○ Non-Compliant
Oxy bottles are stored 3m from Acetylene bottles	○ Compliant	○ Non-Compliant

Compressed air hoses are in good condition and secured with pins/chains	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Dangerous Goods & Hazardous Substances

There is a secure storage area for DG's & Haz. Substances	○ Compliant	○ Non-Compliant
There is adequate signage around the store	○ Compliant	○ Non-Compliant
A register of Hazardous Substances is maintained	○ Compliant	○ Non-Compliant
Material Safety Data Sheets are available for all hazardous chemicals on site and are less than 5 years old	○ Compliant	○ Non-Compliant
All containers are clearly labeled	○ Compliant	○ Non-Compliant
Fire extinguisher is in pace near the store	○ Compliant	○ Non-Compliant
MDF products are being cut in designated cutting room with signage (no unauthorized entry),	○ Compliant	○ Non-Compliant
Exhaust ventilation (away from other workers or public), closed doors.	○ Compliant	○ Non-Compliant
Power tools used on MDF has dust collection bag,	○ Compliant	○ Non-Compliant
MDF work area is vacuumed or wet swept daily. Dust double bagged and sealed prior to disposal in site bin.	○ Compliant	○ Non-Compliant
Ventilation and extraction system in place in enclosed areas containing dusts, fumes from chemicals and plant	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Excavation Work

Sides of excavations are shored or otherwise made safe.	○ Compliant	○ Non-Compliant

Benching and battering is consistent with the Code Of Practice? (Note: if non-compliant, obtain a sign off by a geotech or other competent person)	○ Compliant	○ Non-Compliant
Access into excavations is suitable.	○ Compliant	○ Non-Compliant
Excavations are adequately barricaded, fenced and or sign posted.	○ Compliant	○ Non-Compliant
Existing underground services and other potential effects to surrounding structures are identified and controlled.	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Noise

Workers are not exposed to noise peaking at 140db, or 85db for 8 hours without protection.	○ Compliant	○ Non-Compliant
Noise reading taken and recorded for noisy work or new plant and equipment on site.	○ Compliant	○ Non-Compliant
Suitable PPE used (Ear plug/muffs are correct type for the job).	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Land (Flora & Fauna)

Protected trees are identified and fenced off as required.	○ Compliant	○ Non-Compliant
Materials are not stored under the drip line of trees (eg construction materials, chemical stores, parked cars, stockpiles etc.).	○ Compliant	○ Non-Compliant
Chemicals used to controls pests are carried out by licensed operators in approved areas only.	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Falls (Ladders)

Only platform ladders with edge protections are being used to carry out work.	Compliant	Non-Compliant
All ladders stable and securely fixed at the top and bottom	Compliant	Non-Compliant
All rungs and stiles intact and in good condition	Compliant	Non-Compliant
The slope of the ladder at a safe angle 4:1	Compliant	Non-Compliant
The ladders are clear of doorways?	Compliant	Non-Compliant
Ladders extend at least 1m above the landing or working platform	Compliant	Non-Compliant
Only fiberglass or timber ladders used near electricity	Compliant	Non-Compliant
Ladders are protected from being hit by moving vehicles	Compliant	Non-Compliant

Checklists

SECTION 2: Falls (Scaffolds)

Scaffolds inspected monthly by a competent/qualified person	Compliant	Non-Compliant
There are solid foundations under the scaffolding	Compliant	Non-Compliant
There are proper sole and base plates for the standards	Compliant	Non-Compliant
There safe access to the work platforms	Compliant	Non-Compliant
There's adequate bracing in all directions	Compliant	Non-Compliant
Handrails and kickboards are in place on all scaffolds over 2m	Compliant	Non-Compliant
All work platforms are fully decked out	Compliant	Non-Compliant

Scaffolding is tied to the structure at least every 3.6m vertically and horizontally	○ Compliant	○ Non-Compliant
Ladders within scaffolds are secured	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Falls (Mobile Scaffolds)

Mobile scaffolds have lockable castor wheels, and are locked when in use	○ Compliant	○ Non-Compliant
There's safe ladder access to the mobile scaffold	○ Compliant	○ Non-Compliant
Mobile scaffolds have outriggers in place (i.e. where the height is greater than 3 X Width)	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Access & Egress

Access and egress paths are clear	○ Compliant	○ Non-Compliant
Access and egress paths are defined (signage, tape or other)	○ Compliant	○ Non-Compliant
Prohibited areas clearly sign posted and barricaded	○ Compliant	○ Non-Compliant
Lighting including emergency lighting adequate	○ Compliant	○ Non-Compliant
Traffic Management controls (outside the site) are in place	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Public Protection

Site fences are adequately braced.	○ Compliant	○ Non-Compliant
Site gates are kept closed when not in use	○ Compliant	○ Non-Compliant

Fences/gates are clearly sign posted (warning, directions to site office etc)	○ Compliant	○ Non-Compliant
Overhead protection is provided	○ Compliant	○ Non-Compliant
Approved permit in place for public domain works	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Land (Waste)

New building materials being stored separately to waste. Designated areas must be set aside for new material storage.	○ Compliant	○ Non-Compliant
Excess construction materials separated for reuse or recycling.	○ Compliant	○ Non-Compliant
All truck loads leaving site are covered and tailgates sealed.	○ Compliant	○ Non-Compliant
Waste is being removed weekly.	○ Compliant	○ Non-Compliant
Contaminated waste removed from site. Records are kept for the transport and disposal of the material at a licensed facility	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Land (Erosion & Sediment Control)

Roads and path ways are clear of dust/ mud tracked from the work site.	○ Compliant	○ Non-Compliant
Siltation control measures in place around internal drains (e.g. geo-fabric material under drain covers are clean, sand bags/hay bails are not damaged)	○ Compliant	○ Non-Compliant
Siltation control measures in place around external drains (e.g. geo-fabric material under drain covers are clean, sand bags/hay bails are not damaged)	○ Compliant	○ Non-Compliant
Siltation control measures in place at the site boundary (under hoardings) down hill from disturbed/exposed areas.	○ Compliant	○ Non-Compliant

Stockpiles are protected to prevent erosion and sediment leaving site. (ie covered with sediment traps around the stockpile)	○ Compliant	○ Non-Compliant
The erosion and sediment control plan remains relevant for the site conditions and activities.	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Heritage

Heritage structures are protected/fenced off	○ Compliant	○ Non-Compliant
Heritage items/materials removed from existing buildings stored and protected from damage or loss	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Noise And Vibration

Activities generating loud noise near a sensitive receiver. (e.g rock hammering or piling adjacent to community or building occupants)	○ Compliant	○ Non-Compliant
Construction activities and deliveries limited to approved working hours at all times (unless approved)	○ Compliant	○ Non-Compliant
Acoustic barriers/enclosures in place and in good condition	○ Compliant	○ Non-Compliant
Noise levels do not exceed allowable limits (as per DA/Contract) and records of noise monitoring kept.	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Electrical

Portable electrical equipment/leads/ RCDs are in good condition, tested & tagged 3 monthly.	○ Compliant	○ Non-Compliant
Fixed electrical equipment tested and tagged 6 monthly.	○ Compliant	○ Non-Compliant

RCD's are used with all portable electrical equipment	○ Compliant	○ Non-Compliant
Portable RCD's are trip time tested every 3 months.	○ Compliant	○ Non-Compliant
Fixed RCD's are trip time tested every 12 months.	○ Compliant	○ Non-Compliant
Extension leads supported above work and damp areas	○ Compliant	○ Non-Compliant
Leads not in contact with metal parts of supports/studs/hooks etc.	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Plant & Equipment

Plant and Equipment registers available and current (e.g. Lifting gear, mobile plant, fall restraint equipment etc)	○ Compliant	○ Non-Compliant
Plant and equipment maintained and records available	○ Compliant	○ Non-Compliant
All plant is fitted with functioning reversing alarms and flashing lights	○ Compliant	○ Non-Compliant
Operators are ticketed/competency verified	○ Compliant	○ Non-Compliant
Extinguishers are installed and operable	○ Compliant	○ Non-Compliant
Traffic Movement controls (within site) are in place (Barricades, signs, barrier tapes) are in use as required	○ Compliant	○ Non-Compliant
Plant is working clear of overhead power lines	○ Compliant	○ Non-Compliant
All plant has the Safe Working Load (SWL) clearly displayed	○ Compliant	○ Non-Compliant
Daily log books are completed	○ Compliant	○ Non-Compliant
Faulty equipment and plant are identified and prevented from use	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Manual Tasks

Manual tasks are conducted as per approved SWMS	○ Compliant	○ Non-Compliant
Lifting equipment is available for heavy or awkward loads.	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Water Quality & Conservation

Collected groundwater is tested and treated prior to discharge.	○ Compliant	○ Non-Compliant
Runoff from undisturbed areas are diverted around the site.	○ Compliant	○ Non-Compliant
Contaminated water (soil, construction waste etc) is collected in designated area on site and treated to remove solids prior to discharge.	○ Compliant	○ Non-Compliant
Contaminated water is not discharged into sewer (without a permit).	○ Compliant	○ Non-Compliant
Concrete wash down areas have been established and in good condition. Waste concrete is collected and recycled.	○ Compliant	○ Non-Compliant
Wash out facilities (for painters, renderers, gyprockers, etc) have been established and maintained to prevent discharge of contaminated water.	○ Compliant	○ Non-Compliant
Contaminated water removed from site for treatment and disposal.	○ Compliant	○ Non-Compliant
Records are kept for the transport and disposal of the material at a licensed facility	○ Compliant	○ Non-Compliant
Taps and hoses are not kept running or leaking	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Air Quality

Exposed earth has been adequately moistened to prevent dust from escaping.	○ Compliant	○ Non-Compliant
Demolished material/excavated soil is stockpiled in designated temporary stockpile areas only.	○ Compliant	○ Non-Compliant
Stockpiles are covered in waterproof material.	○ Compliant	○ Non-Compliant
Plant and equipment on site are in good working order (noise, minimal exhaust fumes, no oil leaks)	○ Compliant	○ Non-Compliant
All loads leaving site are covered and tailgates sealed.	○ Compliant	○ Non-Compliant
Dust barriers (screening) are in a good and operable condition.	○ Compliant	○ Non-Compliant
Sewer access chambers and pipe work covered when not in use.	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Community (Liaison & Consultation)

Neighbours are notified of upcoming construction activities that have the potential to impact their property. (eg. noise, vibration, temporary change of hours)	○ Compliant	○ Non-Compliant
Site contact details (name and number) in place at the site gate and up to date	○ Compliant	○ Non-Compliant
Hoardings free of graffiti and bill posters	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Hazardous Substances & Liquids

All liquid storage containers are secure and in impervious bunds	○ Compliant	○ Non-Compliant
Acid Sulphate Soils, asbestos, contaminated material has been identified and controlled appropriately.	○ Compliant	○ Non-Compliant

The material is handled and stockpiled in accordance with relevant safety environmental legislation and approved project management plans.	○ Compliant	○ Non-Compliant
There is a spill kit on-site and personnel have been trained in its use	○ Compliant	○ Non-Compliant
Is there any evidence of spills on site?	○ Compliant	○ Non-Compliant
Have appropriate measures been taken to contain any spill?	○ Compliant	○ Non-Compliant
Spill kits are well stocked and available near 'active' work areas and storage bunds. Check stocks.	○ Compliant	○ Non-Compliant

Checklists

SECTION 2: Other Hazards

Are there any further Hazards to report?	○ Yes	○ No

Other Observations

Ref	Classification	Responsible	Priority	Due Date	Date Closed

Outcomes

Metric	Count	%
Negative Observations	0	0%
Positive Observations	0	0%
Open Observations	0	0%
Closed Observations	0	0%
Yes	0	0%
No	0	0%

Appendix C2 (g) Soil and Water Quality Management Plan

PRM Soil and Water Management plan

PROGRESSIVE RISK MANAGEMENT

Soil and Water Management Plan

URBNSURF Sydney Project

Corner Hill Road and Holker Busway, Sydney Olympic Park NSW

URBNSURF Sydney Pty Ltd

P034987.001

Version C | August 2021

Document Control

Project Details:	
Report Name:	Soil and Water Management Plan
Client:	URBNSURF Sydney Pty Ltd
Project:	URBNSURF Sydney (USS)
Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Project Reference:	P034987.001 / C0332

Report Version:					
Version Date:	**Review Process:**			**Issued to:**	**Summary of changes from previous version:**
	Prepared:	**Reviewed:**	**Approved:**		
Ver A 19 February 2021	LAT	APB	APB	URBNSURF	Original Report
Ver B 5 July 2021	LAT	APB	APB	URBNSURF SOPA	Updated to address comments provided by USS and SOPA.
Ver C XX August 2021	LAT	SKU			Updated to incorporate second round of comments provided by SOPA

Report Review:					
Report Version / Revision:		Version C			
Prepared by:		**Technical Review by:**		**Authorised for Issue by:**	
	Luke Trevena				
	Senior Consultant				
	XX August 2021				

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Appendices

Figures

Appendix A – Erosion and Sediment Control

Appendix B - Discharge to Stormwater Records

Appendix C - Inspection Records

1. Introduction

Progressive Risk Management Pty Ltd (PRM) were engaged by URBNSURF Sydney Pty Ltd (URBNSURF) to prepare a Soil and Water Management Plan (SWMP) for the URBNSURF Sydney (USS) Project located at the Pod B P5 Carpark, Hill Road, Sydney Olympic Park NSW (the site).

1.1. Background

URBNSURF Sydney will be a world-class sport, recreation, leisure, tourism and event facility orientated around a surfing lagoon sited at Pod B P5 Carpark, Hill Road, Sydney Olympic Park.

The project is State Significant Development with development consent conditions granted by Minister of Planning (ref: SSD 7942, dated 20 December 2017). Prior to commencement, condition C2(g) of the development consent requires a SWMP to be included within the construction environmental management plan, which shall be prepared and implemented. The condition has been applied to protect downstream properties, local stormwater systems and natural watercourses.

1.2. Objective

The objective of the SWMP is to detail the soil erosion control measures to be implemented during construction in accordance with the Landcoms guideline "Part 1: Managing Urban Stormwater - Soils and Construction" and applicable development consent condition. The SWMP informs the Construction Environmental Management Plan to be prepared and implemented for the site.

1.3. Regulatory Framework

The following legislation, regulations and industry guidance has been considered in the preparation of this report:

- NSW Government (Landcom) and Department of Environment and Climate Change (DECC), Managing Urban Stormwater: Soils and Construction, Volume 1 (2004) (the "Blue Book").
- Australian and New Zealand Governments Guidelines for Fresh and Marine Water Quality 2018 (superseding ANZECC 2000).

1.4. Development Consent Conditions

Specific to the project, the SWMP has been prepared in accordance with the requirements outlined the development consent. An evaluation of the SWMP compared to the development consent conditions is provided in **Table 1** below.

Table 1: Development Consent Condition Requirements

Requirement	Response
Condition C3 – Prior to the commencement of works, the Applicant shall prepare and implement a Soil and Water Management Plan to manage soil and water impacts during construction of the proposal. The Plan must: (a) be prepared in accordance with the provisions of the Landcom's 'Blue Book, Part 1, Managing Urban Stormwater: Soils and Construction 2004 (4th edition). (b) consider likely stages of the works and provide for appropriate control of sediment and erosion for each stage and include, but not be limited to: i. location and extent of all necessary sediment and erosion control measures for the site. ii. all relevant details and calculations of the sediment basins including sizes, depths, flocculation, outlet design, all relevant sections, pump out systems, and depths. iii. location of any temporary stockpiles (soil, spoil, topsoil or otherwise) and accompanying sediment and erosion control measures. iv. location and details of all vehicle wash down bays and associated erosion and sediment control measures such as earthen bunds. v. a daily and weekly site inspection checklist consistent with IECA Best Practice Erosion and Sediment Control documents. C3(c) include a suitable water quality run-off monitoring program. The Plan must be approved by SOPA's Director, Planning and Environment, prior to the commencement of works.	**Compliant** (a) This SWMP has been prepared in accordance with the Blue Book. (b) Refer to Section 3.1. i. Refer to Figure 2. ii. Refer to Section 3.3 and utilise electrical submersible pumps. iii. Refer to Figure 2. iv. Wash provisions at site exit refer to Figure 2. Plant decontamination will be addressed within other applicable subplans. v. **Appendix B** and **Appendix C**. (c) Refer to **Section 3.5**.
Condition D9 - All erosion and sediment control measures are to be effectively implemented and maintained at or above design capacity for the duration of the construction works and until such time as all ground disturbed by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment.	**Compliant** Refer to **Section 3.1.**
Condition D11. Any water to be discharged from the site, including any groundwater, surface water or stormwater must comply with the following standards: • Total suspended solids (TSS) - <50mg/Litre. • pH - pH 6.5-8.5. • Oil and grease - No visible sheen on released waters. • All other contaminants - ANZECC 95% limits for protection of ecosystem health.	**Compliant** As per discharge protocol in **Section 3.4, Section 3.5** and record keeping in **Appendix A**. ANZECC 95% considered for dewatering of groundwater and leachate in applicable subplan.
Condition D12 - No approval is granted to pollute waters. All water discharge from the site must meet all requirements of the Protection of the Environment Operations Act 1997.	**Compliant** As per discharge protocol in **Section 3.4** and record keeping in **Appendix A**.
Condition D21 - All vehicles involved in the excavation and / or demolition process and departing from the property with materials, spoil or loose matter must have their loads fully covered before entering the public roadway.	**Compliant** **Section 4.1** has reiterated the requirement for all truck loads to be covered.
Condition D22 - Prior to the commencement of work, suitable measures are to be implemented to ensure that sediment and other materials are not tracked onto the roadway by vehicles	**Compliant** Wash provisions at site exit refer to

Table 1: Development Consent Condition Requirements	
Requirement	**Response**
leaving the Site. It is an offence to allow, permit or cause materials to pollute or be placed in a position from which they may pollute waters.	**Figure 2**. Plant decontamination addressed in Asbestos Management Plan (CEMP subplan).
D23. The Applicant must ensure that: a) stockpiles of excavated material do not exceed 4 metres in height; b) stockpiles of excavated material are constructed and maintained to prevent cross contamination; and c) suitable erosion and sediment controls are in place for stockpiles.	**Compliant** Stockpiles will be managed in accordance with **Section 4.2.** Refer to **Figure 2.**

2. Site Information

2.1. Site Identification

A summary of site identification and surrounding is provided in **Table 2**.

Table 2: Site Identification	
Detail	**Information**
Site Address:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Lot Parcel:	Part Lot 71 in Deposited Plan 1191648
Site Area	3.2 hectare
Local Council:	City of Parramatta
Current Zoning:	RE1 Public Recreation Zone, under the State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009
Current Site Use	Pod B P5 Carpark
Proposed Future Use:	URBNSURF surf park (public recreation facility)
Surrounding Land Use	**North**: Millennium Parklands, the Newington Armory and a mixture of commercial and residential buildings. **South:** Haslams Creek, parklands, a conservation area and Sydney Olympic Park facilities (commercial buildings, stadiums and arenas). **East:** A carpark, recreational facilities (BMX track and archery centre) and wetland. **West:** A car park, vacant private land with some commercial operations beyond.

2.2. Environmental Setting

The environmental setting is summarised in **Table 3**.

Table 3: Environmental Setting	
Detail	**Information**
Soils and Geology:	The Department Industry, Resources and Energy, 1983, 1:100,000 Geological Series Sheet 9130 (Edition 1) indicates that the site comprises of man-made fill including dredged estuarine sand, demolition rubble, industrial and household waste. This material is underlain by silty to peaty quartz sand, silt and clay with ferruginous and humic cementation and common shell layers. The geology encountered during the ESI conducted by WSP (Reference: 2270060A-CLM-REP-001 RevB) comprised mixed fill material from beneath surface asphalt/concrete to the maximum depth of the investigation at 3 metres below ground level (mBGL). The most predominant fill material units observed were a brown gravelly sand and a brown gravelly clay. Fill material comprised of anthropogenic materials was also observed in the northeast portion of the site.

Table 3: Environmental Setting	
Detail	**Information**
Acid Sulfate Soils:	**NSW Planning Portal** A review of the City of Parramatta (Sydney Olympic Park) Local Environment Plan 2012 within the NSW Planning Portal indicated the site was in an area of "disturbed terrain" and did not prescribe any requirement for development consent (or controls) for carrying out work. However a Class 2 Area ~250 m west of site was noted. **SEPP (State Significant Precincts) 2005 (Amended 2017)** The Acid Sulfate Soil Map (SEPP_SSP_SOP_ASS_001_20170607) for Sydney Olympic Park documents the site is within an area of "disturbed terrain". The Sydney Olympic Park Acid Sulfate Soil Risk Map describes "disturbed terrain" as filled areas of low-lying swamps for urban development. Other disturbed terrain includes areas which have been mined or dredged or have undergone heavy ground disturbance through urban development or construction of dams or levees. Soil investigations are required to assess these areas for acid sulphate potential. Additionally the following features in the vicinity of the site were noted: • Haslams Creek ~100 m south is classed as "high probability at or near the ground surface" area. • Nuwi Wetland ~200 m east is classed as "high probability within 1 m of the ground surface". **CSIRO ASRIS** A review of the CSIRO Atlas of Australian Acid Sulfate Soils indicated that the site is within an area of "low probability of occurrence" of acid sulfate soils. **Historical Image Review** A review of historical aerial images provided confirmed the USS Project is sited within a low lying coastal area with mangroves apparent on the banks of Wentworth Bay. The site and surrounding area have since been filled; however it is likely the estuarine deposits (PASS) remain in their natural condition. *An acid sulfate soil assessment is pending at the time of this SWMP being written. A site specific acid sulfate soil management plan, including controls for managing runoff, will be provided in the event acid sulfate soils are confirmed within deep (>5m) estuarine deposits underlying the site.*
Hydrogeology:	The nearby Newington and Bicentennial Park Wetlands (located approximately 30 m north of the site) are nationally significant, although based on the NSW Planning Portal the site is not considered to include wetlands. The site is surrounded by constructed drainage basins (Narawang Wetland to the north) and estuaries (Haslams Creek to the south) connecting to the tide-dominated Parramatta River (approximately 750 m east). Groundwater is likely to flow in an easterly direction towards Haslams Creek and Parramatta River.
Topography / Drainage:	Surface elevation across the site ranges from approximately 9 meters Australian Height Datum (mAHD) in the south to 5 mAHD in the north, with an approximate 3% grade. Surface water is expected to drain towards the stormwater drainage channels located in the centre and north-west of the site. Surface water and groundwater is anticipated to then flow east towards Haslams Creek approximately 150 m east of the site and the Parramatta River 750 m east of the site, which ultimately discharge into Wentworth and Homebush Bay. As the overall slope is <5% grade, the site poses a "Low Erosion Risk" as defined by the Blue Book.
Sensitive Receptors:	Sensitive environmental receptors are considered to include the environmental conservation area that surrounds the site and Haslams Creek and, Parramatta River.

3. Erosion and Sediment Control Principles

The following principles, detailed within the Blue Book (Landcom, 2004) outline the overall approach to erosion and sediment control for the site:

- Minimising surface disturbance and restricting access to undisturbed areas.
- Progressive rehabilitation/stabilisation of infrastructure areas.
- Separation of runoff from disturbed and undisturbed areas, where practicable.
- Construction of surface drains to control and manage surface runoff.
- Construction of surface dams or use of existing/modified water storages to contain runoff up to a specified design criterion.

3.1. Timeline of Events

Establishment of erosion and sediment controls will generally occur in the following order:

1. Construction of cut-off drain (upslope of exaction area) adjacent embankment area.
2. Construction of collection drains (downslope of or within disturbance areas) where required to direct runoff to sediment dams and/or other storages.
3. Construction of sediment fences and sandbags (downslope of disturbance and areas (where required). Sediment fences will be fixed in place via the most fit for purpose method (eg. Pilot hole through bitumen to fix star pickets).
4. Installation of rumble grid and wheel washing provisions at site exist (noting trucks shall remain on hardstand during load out of excavated material).
5. Construction of permanent sediment basins or alternative temporary basis at least 48 hours prior to rainfall events.
6. All controls to remain for the duration of all construction activities, until permanent fixtures and controls are in place.

3.2. Design Criteria

The design criteria for sediment control structures are summarised below in **Table 4**.

Table 4: Design Criteria for Sediment Control Structures

Sediment Control Structure	Function	Design Capacity
Upslope diversion drains	Reduce runoff from undisturbed areas onto disturbed areas. The design of the diversion drain will be reviewed with the aim of not minimising impacts to surface run-off from upstream carparks. This will be monitored and refined as required.	Peak flow calculated for 1 in 10 year critical rainfall event (Landcom (2004) S5.4.3 (b)-(d))
Downslope collection drains	Intercept and direct disturbed area runoff water to sediment dams/sumps.	
Sediment dams	Containment of sediment laden runoff from disturbed areas with more than 150 m^3 per year estimated soil loss (Landcom (2004) S6.3.2 (d))	Settling Zone: Capacity to store the runoff produced from the 80th percentile, 5-day rainfall even as per the Blue Book (Landcom ,2004). Sediment Zone: Two months calculated soil loss estimated using the Revised Universal Soil Loss Equation as per the Blue Book (Landcom ,2004).
Sediment fences and/or sandbags.	Retention/filtration of suspended sediments.	Limit flow to less than 50 L/s in the design, 1 in 10 year critical duration rainfall event (Landcom (2004) S6.3.7 (e)).

3.3. Sediment Dam Design

Sediment basins required to capture runoff outside the excavation area are based on the methodology and parameters outlined in the Blue Book (Landcom, 2004). A sediment basis capacity of **414 m³** has been designed by Northrop Consulting Engineers. Assuming catchment area for the sediment dam of 3.2 Ha, appropriate rainfall estimates and RUSLE factors. Sediment dam batters should be covered (e.g. with geofabric) to prevent erosion. Note the exact dimensions and location of the sediment basin may vary throughout the course of the project provided the minimum capacity (414 m^3) is available and spillway appropriate for a 10 year ARI storm event directing overflow to a stormwater outlet can be constructed.
Refer to **Appendix A** for details of the erosion and sediment controls.

3.4. Sediment Dam Dewatering

Following rainfall events, stormwater collected within the sediment basin should be tested for TSS/NTU initially to confirm whether natural settlement has occurred. The site soils are expected to be "Type D" as defined by the Blue Book and will likely require addition of a flocculant (e.g. gypsum) to assist the settlement of dispersed fines. The application of flocculants should be undertaken using the methodology provided within Appendix E of the Blue Book. No aluminimum-based flocculants are to be used.

If the available freeboard volume in sediment dams is approaching the required design capacity between rainfall events. Rainwater may be discharge from the site subject to meeting the criteria specified by the Blue Book, including:

- Oil & Grease – no visible sheen.
- Total suspended solids (TSS) less than 50 mg/L (equivalent to turbidity <63 NTU for most soil types).
- pH between 6.5 to 8.5.
- All other contaminants below ANZG 2018 criteria for 95% protection of marine species.

Discharge of rainwater from site should document by the WHSEQ representative with the minimum details specified in **Table 5** below using the field form within **Appendix B**.

Table 5: Discharge to Stormwater Record

Date	Estimated Volume	Water Quality	Approved for Discharge
DD MM YYY	XX m^3	O&G: *No visible trace* **Y/N** TSS: <50 mg/L **Y/N** pH 6.5-8.5 **Y/N** All other contaminants below ANZG 2018 criteria for 95% protection of marine species **Y/N**	NAME: SIGNATURE:

If water meets the criteria, it will be discharged into stormwater. The nominated point for discharge is the stormwater drain to the North of the site, adjacent to Hill Road that is connected to Haslam's Creek. This has been selected to avoid impacts to Narawang wetland. The Principal Contractor will prescribe the method of release (eg. Pump through hose) and ensure no loss of water to surrounding areas.

All discharge will be done through a filter cloth to ensure that no asbestos waste is released as part of dewatering. This extra control reinforces the controls of filter cloths employed at the source of piling and in sediment controls at asbestos work areas, as detailed in Section 4.6 of the Groundwater and Leachate Management Plan and Section 5.4 of the Asbestos Management Plan.

It is noted that SOPA does not provide approval to pollute waters and any discharge will comply with the POEO Act and the criteria specified by the Blue Book. Further, relevant approval must be sought and regulatory bodies and asset owners must be notified of water

discharge. There is to be no un-certainty around discharge point or methodology of discharge. Consultation with SOPA must be sought when assessing discharge options and/or changes in methodology.

If the aforementioned is not adhered to or if any of the water quality criteria are not complied with, stormwater must not be discharged from site.

Contingencies where water quality does not meet criteria include:

1. Retreat captured stormwater with flocculants.
2. Reuse captured stormwater onsite for dust suppression.
3. Implement alternative treatment methodologies such as sediment tanks, cyclones, granular filters, or other available technology.
4. As a last resort stormwater can be disposed to an offsite water treatment facility using the procedure provided within the Groundwater and Leachate Management Plan approved for the project.

3.5. Water Quality Monitoring Program

The Environmental Consultant is to be notified when the sediment basin is nearing capacity to collect a sample of stormwater requiring disposal. One water sample per discharge event will be analysed for the constituents of concern and compared to Blue Book and ANZG2018 criteria for 95% protection of marine ecosystems presented in **Table 6**.

Table 6: Water Quality Criteria

Analyte	Discharge Criteria[1]	Criteria Source	Test Method
Physio-chemical			
Oil and Grease	No visible sheen OR <10 mg/L	The "Blue Book"	Visual Or NATA Laboratory
pH (units)	7.0 to 8.5 pH Units		Calibrated Field Meter or NATA Laboratory
Turbidity (NTU)	63 NTU		
Hardness	500,000	ANZG 2018 DGV (Recreational) *Not applicable where discharged directly to marine water.*	NATA Laboratory
Metals			
Aluminium	55 (freshwater pH>6.5)	ANZG 2018 DGV (Marine) *Freshwater criteria adopted in instance where a marine criterion is not provided.*	NATA Accredited Laboratory
Arsenic (III)[3]	24 (freshwater)		
Arsenic (VI)[3]	13 (freshwater)		
Cadmium[5]	5.5		
Chromium (III)[3]	27		
Chromium (VI)[3]	4.4		
Copper	1.3		
Lead	4.4		
Mercury (inorganic)[5]	0.4		
Nickle[5]	70		
Zinc	15		
Semi-volatile Total Recoverable Hydrocarbons			
TRH C_{10}-C_{16}	LOR	Detection above LOR *Requires PAH and VOC analysis*	NATA Accredited Laboratory
TRH C_{16}-C_{34}	LOR		
TRH C_{34}-C_{40}	LOR		
Volatile Organic Compounds			
vTRH C_6-C_9	LOR	Detection above LOR	NATA Accredited Laboratory
Benzene[5]	700	ANZG 2018 DGV (Marine)	
Toluene	180		
Ethylbenzene	80		
o-xylene	350 (freshwater)		
m-xylene	75		
p-xylene	200 (freshwater)		
Other Parameters			
Ammonia (as N)	910 (default value) 3910 (adjusted for pH 7)	ANZG 2018 DGV (Marine)	NATA Accredited Laboratory
Benzo(a)pyrene	0.2		
Naphthalene[5]	70		

Notes:

1. All units in micrograms per litre (ug/L) unless stated otherwise.
2. Proposed criteria based on ANZG 2018 Default Guideline Values (DGVs) for highly disturbed marine environments, lowland rivers (turbidity) and the "Blue Book" (pH).
3. Arsenic and Chromium assessment is based on total concentration analysis. Speciation analysis is undertaken only if total As or Cr concentration exceeds a single speciation criterion.
4. Total Recoverable Hydrocarbon (TRH) fractions reported above laboratory Limit of Reading (LOR) require PAH and BTEX analysis to be undertaken.
5. Increased level of protection adopted due to bioaccumulation potential not applicable to isolated short term discharge events.

The Environmental Consultant shall provide written confirmation the water quality monitoring to the contractor including a statement as to whether the water is or isn't suitable for discharge.

4. Control Measures

It will be a requirement of the Principal Contractor to provide their own Construction Environmental Management Plan that includes both proactive and reactive control measures designed to minimise the impact of sediment on surrounding properties, stormwater infrastructure and natural water courses. The primary management measure for erosion and sediment is the control in initial ground disturbance and progressive maintenance of the ground surface throughout earthworks. Where disturbance is unavoidable, erosion and sediment control structures will be constructed.

4.1. Control Methods

The following methods must be employed to control erosion, manage sediment laden runoff and prevent soil being tracked on roads:

- **Sediment dams** – retain runoff volume from a rainfall event such that suspended solids can settle to the base of the dam.
- **Collection drains –** constructed downslope of, or within, disturbed areas where required to convey runoff to sediment dams or other storage. Temporary collection drains within the bulk earthworks area should be excavated to nominal (i.e. 200mm) depth and graded to flow towards the sediment basin.
- **Sediment fences** – vertical support pickets are spaced at a maximum of 2.5m intervals and are placed parallel to contours with limited contributing catchment area to any one section, self-supporting geotextile is placed on the upslope side of the posts.
- **Sandbags** – used similarly to sediment fences with straw bales used instead of geotextile.
- Daily and post rainfall inspections – sediment management structures are inspected routinely (daily) following rain events greater than 25mm in a 24 hour period.
- Site entrances/exits to be stabilised using the methodology provided within the Blue Book i.e. a 3mx3mx0.2m section of suitable aggregate (not sandstone) normally 30-60mm diameter. Additionally, a truck rumble grid (i.e. cattle grid) will assist removal soil from truck wheels prior to leaving site.
- Trucks are to remain on hardstand areas where possible. Where trucks and machines are required to track over exposed soil, wheels/tracks are to be cleaned and inspected prior to departing the site.
- The contractor shall maintain provisions to sweep soil from roads in the event soil is in advertently tracked onto roadways.
- The contractor and sub-contractors will ensure loads are covered prior to leaving the site exit point. This will be addressed by the contractor at the gate and recorded during routine checks on the inspection sheet included in **Appendix C**.
- Any sediment controls utilised in asbestos removal zones will be treated as asbestos waste and handled/removed accordingly. This is in line with Section 5.4 of the Asbestos Management Sub-plan and is to be included in the Asbestos Removal Control Plan.

4.2. Stockpile Management

The following stockpile management controls must be employed to comply condition D23 within the development consent:

- Stockpiles of excavated material do not exceed 4 metres in height.
- Stockpiles of excavated material are constructed and maintained to prevent cross contamination.
- Suitable erosion and sediment controls are in place for stockpiles.
- Stockpiled materials to be covered with plastic or other suitable material to prevent runoff and windborne transport of potential asbestos impacted fill.
- This section is in line with Section 3.1 of the CEMP.

The following stockpile management controls are recommended to comply with the Blue Book:

- Place stockpiles more than 2 meters (preferably 5 meters) from existing vegetation, concentrated waterflow (e.g. the Swale, sediment basin, spillway, or slopes >10%), roads and hazard areas.
- Construct contours as low, flat, elongated mounds with slopes no stepper than 2(H):1(V) grade.
- Where stockpiles are in place for more than 10 days, stabilise (e.g. with spray grass or geofabric) to reduce the erosion coefficient (to less than 0.1).
- Suitable erosion and sediment controls including diversion drain and sediment fence are in place for stockpiles.

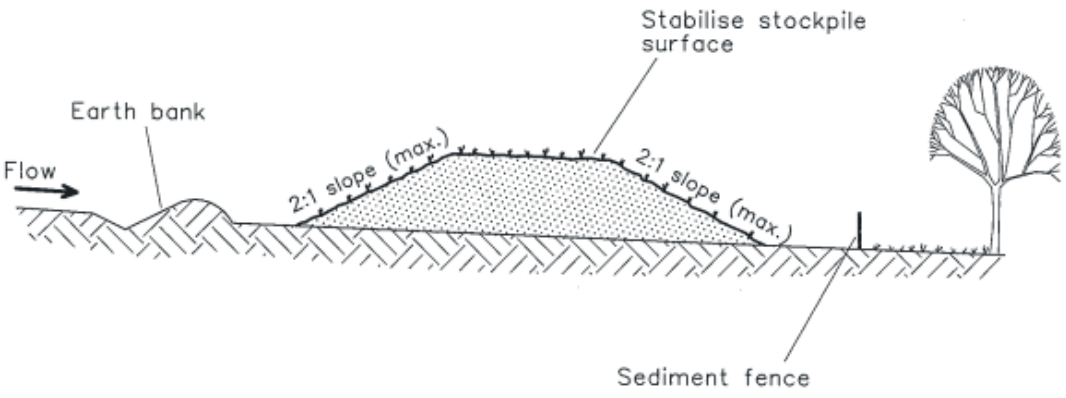


Image: Stockpile management schematic (source: the Blue Book).

5. Maintenance of Erosion and Sediment Control Structures

Daily inspections of sediment control structures, as well as inspections following rainfall events of 25mm or more in a 24 hour period, will be undertaken by Contractor personnel. During these inspections, sediment control structures must be inspected for capacity, structural integrity and effectiveness. Inspections will be documented using a check sheet adapted from Table 8.1 and Table 8.2 of the Blue Book with the minimum details provided in **Table 6** below within the field proforma attached to this SWMP.

Table 6: Erosion and Sediment Control Inspection Record

Detail	Record (circle yes or no)	Corrective Actions
NAME: DATE: SIGNATURE:	• Sediment basins as per SWMP with available capacity? **Y/N** • Embankments protected against erosion? **Y/N** • Cut-off and collection channels constructed? **Y/N** • Drainage points appropriately protected? **Y/N** • Sediment control including silt fences and sandbags in place and working? **Y/N** • Stockpiled soil is confined to within the excavation? **Y/N** • Rumble grid in place and working at site exit? **Y/N** • Loads adequately covered leaving site? **Y/N**	Applicable to any inspected item where **"No"** specified:

Where inspections indicate that sediment accumulation is approaching or exceeding the sediment zone of a dam, desilting will be undertaken in order to reinstate the minimum volumes. Silt fences and straw bales will be inspected, and trapped sediment removed or straw bales replaced as necessary. Removed sediment will be placed within the site footprint.

6. Response Procedures

6.1. Operational Response Process

Where surface water sampling results (following 25mm or more of rain in 24 hours) exceed the impact assessment criteria, the following will be undertaken:

- The project manager and site manager/supervisors will assess the source and extent of the exceedance.
- The Contractor will undertake an investigation and provide a detailed report within seven days of the incident.
- Any corrective action will be recorded in the site Safety Environment Quality (SEQ) folder database and reported to the Health Safety Environment Quality (HSEQ) Manager.

6.2. Complaint Response

All complaints received in relation to erosion and sedimentation will be responded to in accordance with the Stakeholder Communication and Consultation Procedure. This provides details on how to receive, handle, respond to and record and action any community complaints.

Upon receipt of a complaint from the community, preliminary investigations will be undertaken as soon as practicable to determine the likely causes of the complaint using information such as rainfall data, location of erosion or sediment and recent water quality monitoring results. A response will be provided as soon as practicable, which may include the provision of relevant monitoring data.

6.3. Complaints Register

All community complaints must be recorded on a complaint register and the HSEQ manager must be notified of all complaints received.

7. Limitations

This report is confidential and has been prepared by Progressive Risk Management (PRM) for URBNSURF Sydney Pty Ltd (the client) in accordance with the terms and conditions provided within the Consultancy Agreement between the client and PRM. This report may only be used and relied upon by the client and must not be copied to, used by or relied upon by any person other than the client. If a third party (limited to only the owner of the property from the client) wishes to rely on this report, they will need to enter a Third-Party Reliance Deed with PRM.

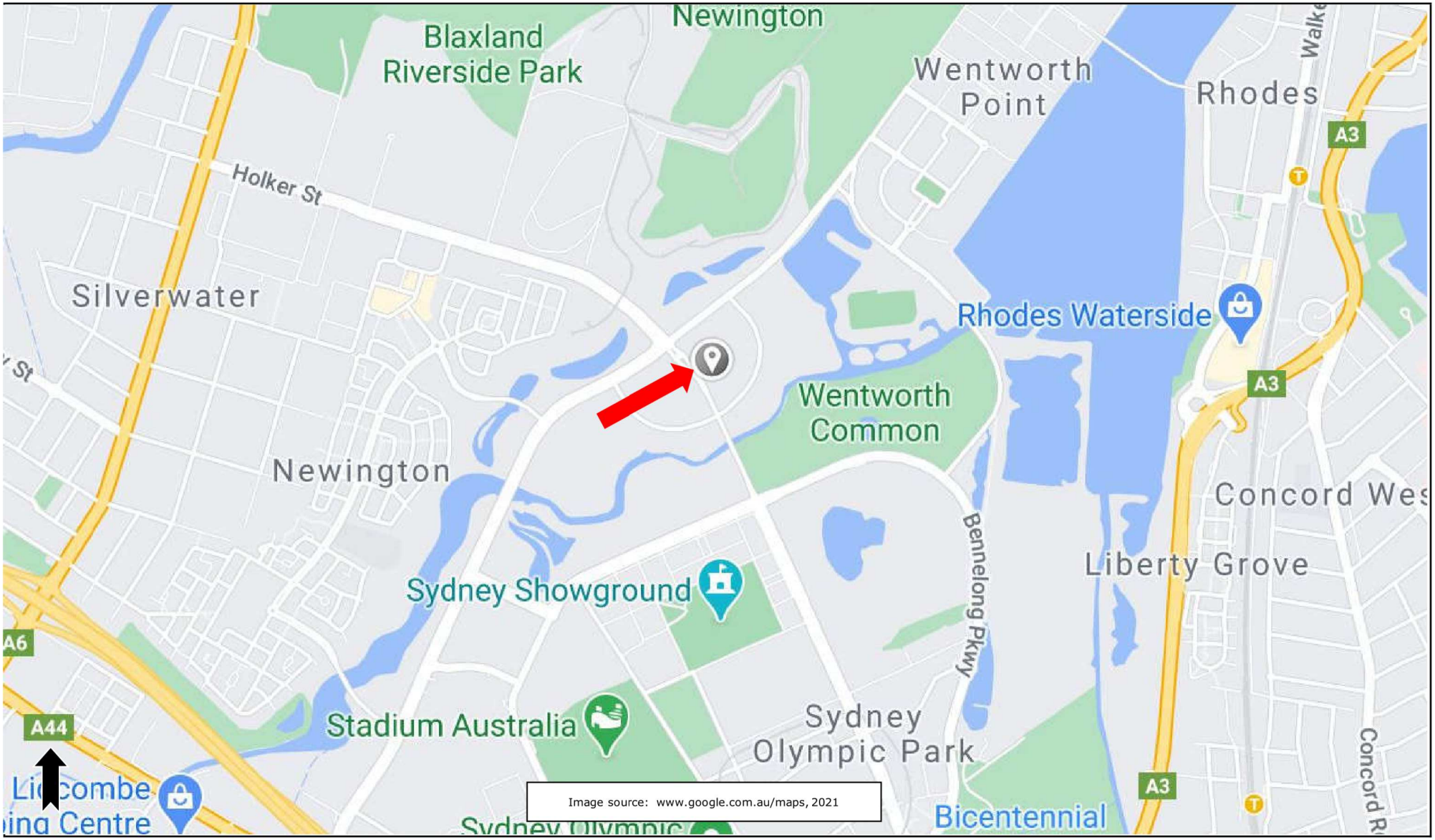
This report is limited to the observations made by PRM and information available and was limited to a desktop study only.

All results, conclusions and recommendations presented should be reviewed by a competent person before being used for any other purpose. PRM accepts no liability for use of, interpretation of or reliance upon this report by any person or body other than the client. Third parties must make their own independent inquiries.

This report should not be altered amended or abbreviated, issued in part or issued incomplete without prior checking and approval by PRM. PRM accepts no liability that may arise from the alteration, amendment, abbreviation or part-issue or incomplete issue of this report. To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by PRM and this report are expressly excluded (save as agreed otherwise with the client).

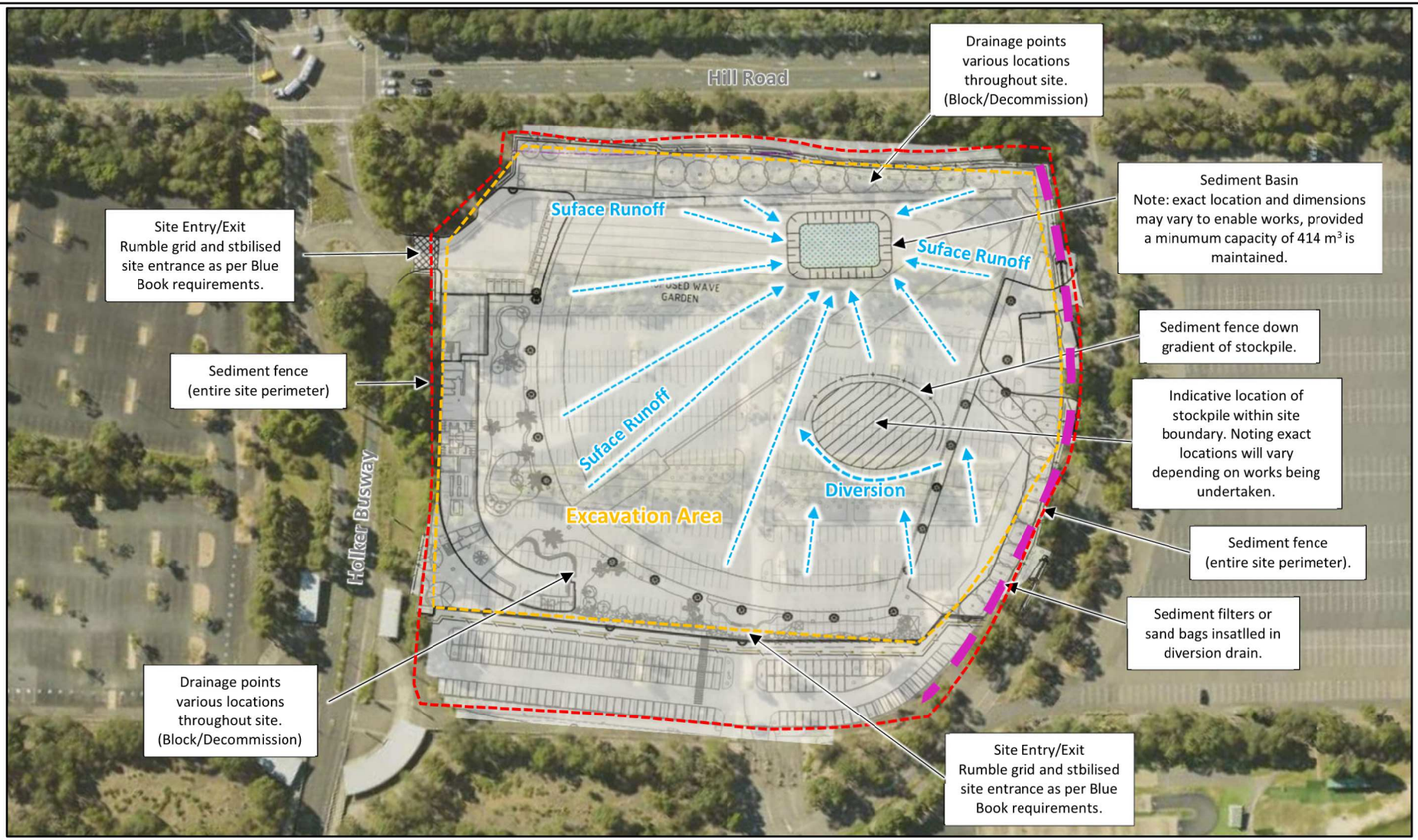
PRM shall bear no liability in relation to any change to site conditions after the date of this report. This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope and limitations defined herein (Scope of Works). Should information become available regarding conditions at the site including previously unknown sources of contamination, PRM reserves the right to review the report in the context of the additional information.

Figures



PROGRESSIVE RISK MANAGEMENT

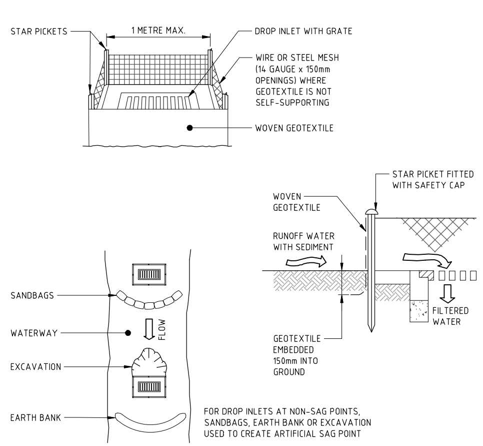
LEGEND					
→	Site Locality	Report Name:	Soil and Water Management Plan		
		Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW		
		Client Name:	URBNSURF Sydney Pty Ltd		
		Project Reference:	P034987.001		
		Figure Number:	1	Figure Name:	Site Locality



PROGRESSIVE RISK MANAGEMENT

LEGEND					
	Approximate site boundary	Report Name:	Soil and Water Management Plan		
	Excavation area	Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW		
	Diversion drain	Client Name:	URBNSURF Sydney Pty Ltd		
	Divert surface water towards sediment basin	Project Reference:	P034987.001		
		Figure Number:	2	Figure Name:	Site Layout

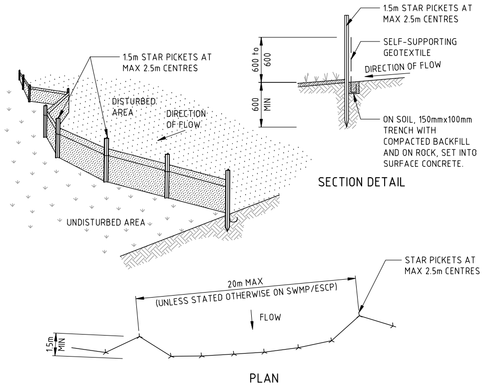
Appendix A – Erosion and Sediment Control



CONSTRUCTION NOTES

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

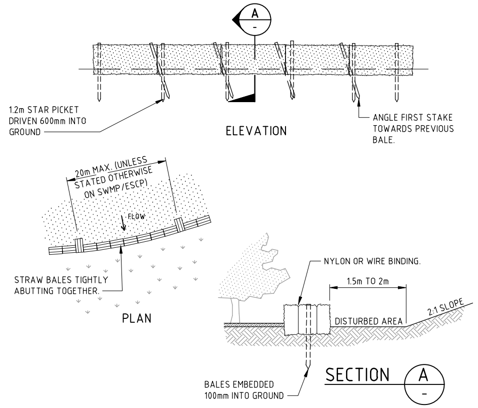
GEOTEXTILE INLET FILTER TRAPS



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

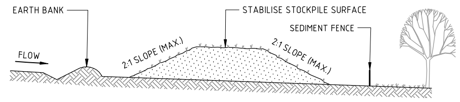
SEDIMENT FENCE



CONSTRUCTION NOTES

1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO GROUND.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 1.2 METRE STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE THEM 600mm INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED AND THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1 TO 2 METRES DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

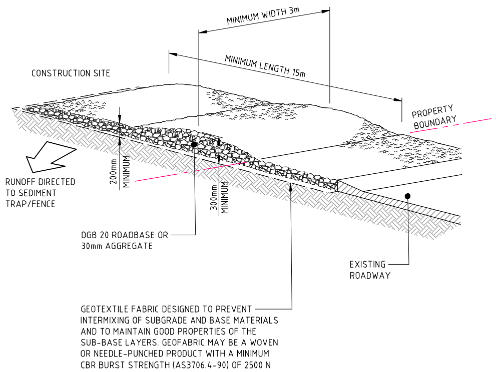
STRAW BALE FILTER



CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE.

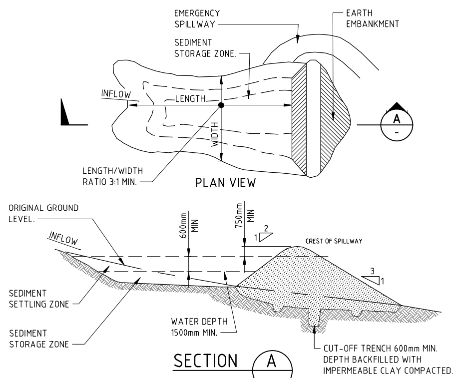
STOCKPILE



CONSTRUCTION NOTES

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

STABILISED SITE ACCESS



CONSTRUCTION NOTES

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AND 1200mm WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95 PER CENT STANDARD PROCTOR DENSITY.
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. CONSTRUCT THE EMERGENCY SPILLWAY.
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY)

EARTH BASIN - WET

NOT FOR CONSTRUCTION

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR INFORMATION	AF	-	SM	17.02.20

CLIENT: URBN SURF

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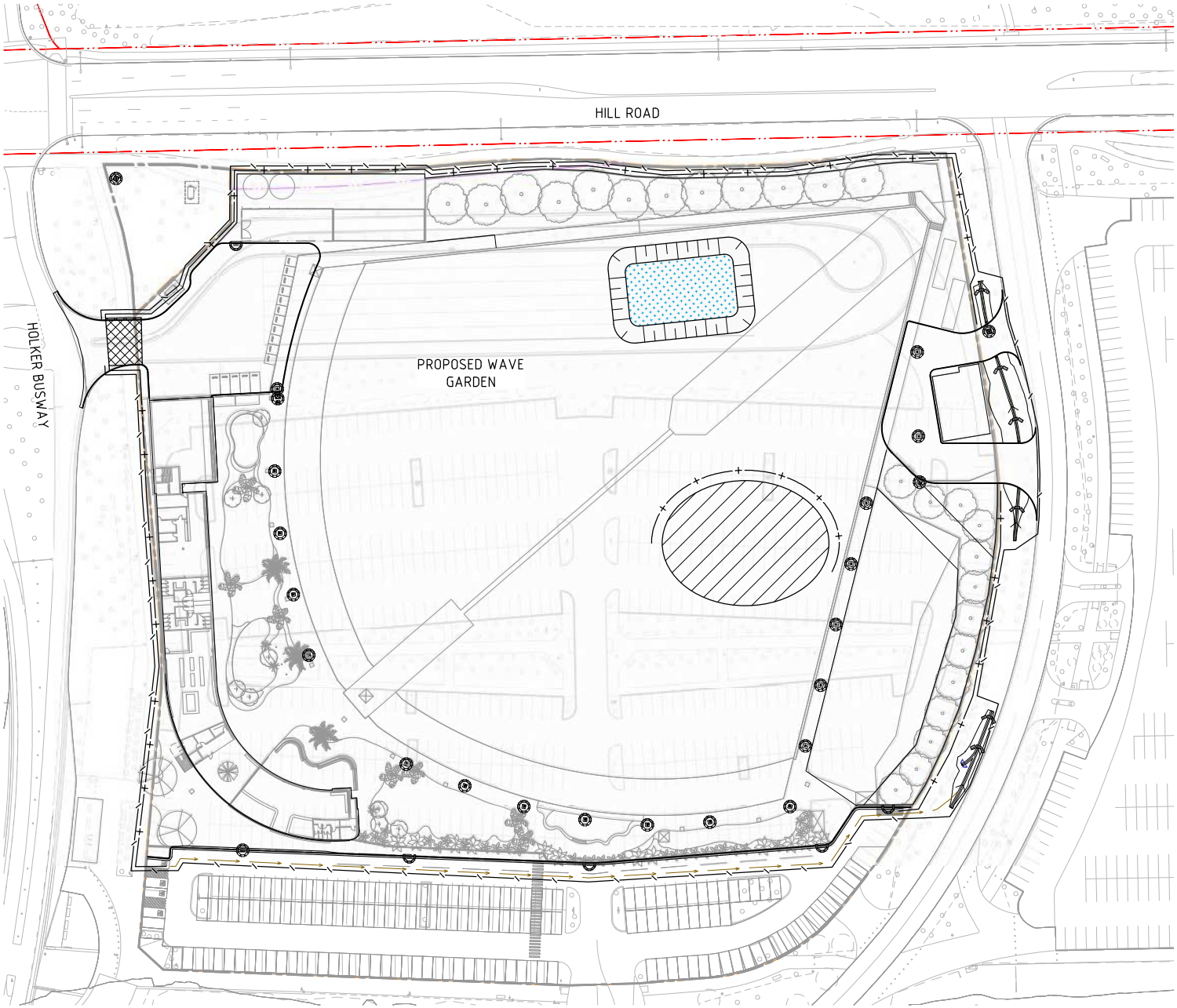
PROJECT: URBNSURF

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
SEDIMENT AND SOIL EROSION CONTROL DETAILS

JOB NUMBER: 191314
DRAWING NUMBER: DAC02.11 REVISION: 1
DRAWING SHEET SIZE = A1

Date : 15.02.2018 11:24 AM Plotted By : ANGUS FALLINS Found : t:\2019 jobs\191314 - urbnsurf\d-drawings\d-northrop\C-CIVIL\2-CAD\2-CAD FILES\1-DA\191314_DAC02.01.dwg



LEGEND

- EXISTING BOUNDARY LINE
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- WIRE MESH AND GRAVEL SEDIMENT FILTER
- SANDBAG SEDIMENT FILTER
- DROP INLET SEDIMENT TRAP
- HAY BALE FILTER
- DIVERSION DRAIN (CLEAN)
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN

1. Erosion Hazard and Sediment Basins

Site Name: UrbnSurf

Site Location: P5 Carpark - Olympic Park

Precinct/Stage: N/A

Other Details: N/A

Site area	Sub-catchment or Name of Structure 1	Notes
Total catchment area (ha)	3.205	
Disturbed catchment area (ha)	3.205	

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D	From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)		Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)		
% clay (fraction finer than 0.002 mm)		
Dispersion percentage		E.g. enter 10 for dispersion of 10%
% of whole soil dispersible		See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D	Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5	See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	75	
x-day, y-percentile rainfall event (mm)	23.3	
Rainfall R-factor (if known)		Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	11.6	

RUSLE Factors

Rainfall erosivity (R-factor)	2910	Auto-filled from above
Soil erodibility (K-factor)	0.031	RUSLE LS factor calculated for a high rill/interrill ratio
Slope length (m)	241.52	
Slope gradient (%)	2.5	
Length/gradient (LS -factor)	0.85	
Erosion control practice (P-factor)	1.3 1.3 1.3 1.3 1.3 1.3	
Ground cover (C-factor)	1 1 1 1 1 1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2 2 2 2 2 2	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.5	See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	100	
Soil Loss Class	1	See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	77	Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	41	See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	373	See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	414	

N.B. for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).

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ARCHITECT: Clarke Hopkins Clarke

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SCALE 1:500@A1 0 5 10 15 20 25m

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PROJECT: URBNSURF

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

CONCEPT SEDIMENT AND SOIL EROSION CONTROL PLAN

JOB NUMBER: 191314

DRAWING NUMBER: DAC02.01

REVISION: 1

DRAWING SHEET SIZE = A1

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Appendix B - Discharge to Stormwater Records

Discharge to Stormwater Record			
Date	**Estimated Volume**	**Water Quality**	**Approved for Discharge**
DD MM YYY	XX m^3	O&G: *No visible trace* **Y/N** TSS: <50 mg/L **Y/N** pH 6.5-8.5 **Y/N** Other contaminants <ANZG2018 criteria for 95% ecosystem protection **Y/N**	NAME: SIGNATURE:

Appendix C - Inspection Records

Soil and Water Control Inspection Record		
Detail	**Record (circle yes or no)**	**Corrective Actions**
NAME: DATE: SIGNATURE:	• Sediment basins as per SWMP with available capacity? **Y/N** • Embankments protected against erosion? **Y/N** • Cut-off and collection channels constructed? **Y/N** • Drainage points appropriately protected? **Y/N** • Sediment control including silt fences and sandbags in place and working? **Y/N** • Stockpiled soil is confined to within the excavation? **Y/N** • Rumble grid in place and working at site exit? **Y/N** • Loads adequately covered leaving site? **Y/N**	Applicable to any inspected item where **"No"** specified:
NAME: DATE: SIGNATURE:	• Sediment basins as per SWMP with available capacity? **Y/N** • Embankments protected against erosion? **Y/N** • Cut-off and collection channels constructed? **Y/N** • Drainage points appropriately protected? **Y/N** • Sediment control including silt fences and sandbags in place and working? **Y/N** • Stockpiled soil is confined to within the excavation? **Y/N** • Rumble grid in place and working at site exit? **Y/N** • Loads adequately covered leaving site? **Y/N**	Applicable to any inspected item where **"No"** specified:
NAME: DATE: SIGNATURE:	• Sediment basins as per SWMP with available capacity? **Y/N** • Embankments protected against erosion? **Y/N** • Cut-off and collection channels constructed? **Y/N** • Drainage points appropriately protected? **Y/N** • Sediment control including silt fences and sandbags in place and working? **Y/N** • Stockpiled soil is confined to within the excavation? **Y/N** • Rumble grid in place and working at site exit? **Y/N** • Loads adequately covered leaving site? **Y/N**	Applicable to any inspected item where **"No"** specified:
NAME: DATE: SIGNATURE:	• Sediment basins as per SWMP with available capacity? **Y/N** • Embankments protected against erosion? **Y/N** • Cut-off and collection channels constructed? **Y/N** • Drainage points appropriately protected? **Y/N** • Sediment control including silt fences and sandbags in place and working? **Y/N** • Stockpiled soil is confined to within the excavation? **Y/N** • Rumble grid in place and working at site exit? **Y/N** • Loads adequately covered leaving site? **Y/N**	Applicable to any inspected item where **"No"** specified:
NAME: DATE: SIGNATURE:	• Sediment basins as per SWMP with available capacity? **Y/N** • Embankments protected against erosion? **Y/N** • Cut-off and collection channels constructed? **Y/N** • Drainage points appropriately protected? **Y/N** • Sediment control including silt fences and sandbags in place and working? **Y/N** • Stockpiled soil is confined to within the excavation? **Y/N** • Rumble grid in place and working at site exit? **Y/N** • Loads adequately covered leaving site? **Y/N**	Applicable to any inspected item where **"No"** specified:

Appendix C2 (h) Groundwater and Leachate Management Plan

PRM Ground Water And Leachate Management Plan

PROGRESSIVE RISK MANAGEMENT

Groundwater and Leachate Management Plan

URBNSURF Sydney Project
Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
URBNSURF Sydney Pty Ltd
P034987.002
Version C | August 2021

Document Control

Project Details:	
Report Name:	Groundwater and Leachate Management Plan
Client:	URBNSURF Sydney Pty Ltd
Project:	URBNSURF Sydney (USS)
Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Project Reference:	P034987.002 / C0332

Report Version:					
Version Date:	**Review Process:**			**Issued to:**	**Summary of changes from previous version:**
	Prepared:	**Reviewed:**	**Approved:**		
Ver A 16 April 2021	APB	SKU	SKU	URBNSURF	Original version of report.
Ver B 12 July 2021	APB	SKU	SKU	URBNSURF SOPA	Updated to address comments provided by USS and SOPA.
Ver C XX August 2021	LAT	SKU			Updated to incorporate second round of comments provided by SOPA

Report Review:					
Report Version / Revision:		Version C			
Prepared by:		**Technical Review by:**		**Authorised for Issue by:**	
	Luke Trevena				
	Senior Consultant				
	XX August 2021				

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4. Groundwater and Leachate Management 7
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Appendix A – Maintenance of Remediation Notice Areas

1. Introduction

Progressive Risk Management Pty Ltd (PRM) were engaged by URBNSURF Sydney Pty Ltd (URBNSURF) to prepare a Groundwater and Leachate Management Plan (GLMP) for the URBNSURF Sydney (USS) Project located at the Pod B P5 Carpark, Hill Road, Sydney Olympic Park NSW (the site as shown in **Figure 1**).

1.1. Background

URBNSURF Sydney will be a world-class sport, recreation, leisure, tourism and event facility orientated around a surfing lagoon sited at Pod B P5 Carpark, Hill Road, Sydney Olympic Park.

The project is State Significant Development with development consent conditions granted by Minister of Planning (ref: SSD 7942, dated 20 December 2017). Prior to commencement, condition C2(h) of the development consent requires a GLMP to be included within the construction environmental management plan, which shall be prepared and implemented. The condition has been applied to protect downstream properties, local stormwater systems and natural watercourses.

This GLMP relates to construction dewatering of potentially contaminated groundwater likely to be encountered during piling works for the USS Project. The GLMP should be read in conjunction with the Soil and Water Management Plan prepared by PRM (ref: P034987.001). The controls prescribed within both the GLMP and SWMP are to be adopted within the Construction and Environmental Management Plan prepared for the site and administered by the appointed Principal Contractor.

1.2. Objective

The objective of the GLMP is to meet the requirements of conditions C2(h), C4 and D11 of SSD 7942 of the development consent and to detail how groundwater and leachate will be managed during construction in accordance with the development consent conditions, applicable legislation, regulations and industry guidance.

The GLMP will form part of the Construction Environmental Management Plan to be implemented for the site.

1.3. Regulatory Framework

The following legislation, regulations and industry guidance has been considered in the preparation of the GLMP:

- NSW Government Water Management Act 2000 (the "Water Act").
- NSW Government Water Management (General) Regulation 2018 and Amendment 2019.
- Australian and New Zealand Governments Guidelines for Fresh and Marine Water Quality 2018.
- NSW Government Sydney Olympic Park Authority Act 2001.
- Sydney Olympic Park Authority (SOPA), Remediated Lands Management Policy, 2010 (amended February 2014).
- SOPA, Remediated Lands Management Plan (Section 3.6 and Section 8) 2009.
- SOPA, Parklands Plan of Management, November 2010.

1.4. Development Consent Conditions

Specific to the project, the GLMP has been prepared in accordance with the requirements outlined the development consent. An evaluation of the GLMP compared to the development consent conditions is provided in **Table 1** below.

Table 1: Development Consent Condition Requirements

Requirement	Response
Condition C4: Prior to the commencement of works, the Applicant shall engage a suitably qualified expert to prepare a Groundwater and Leachate Management Plan detailing how potentially contaminated groundwater and leachate would be managed during construction. The Plan must be prepared in consultation with DPI [sic] and approved by SOPA's Director, Planning and Environment, prior to commencement of works. The Plan must be implemented for the duration of works.	**Compliant** The GLMP has been prepared and reviewed by principal environmental consultants suitably experienced in the assessment and treatment of groundwater. **Compliant** The GLMP has been prepared without departure from the applicable industry guidance and SOPA specific requirements. **Pending** The GLMP is subject to approval by SOPA's Director.
Condition D11: Any water to be discharged from the site, including any groundwater, surface water or stormwater must comply with the following standards: • Total suspended solids (TSS) - <50mg/litre • pH - pH 6.5-8.5. • Oil and grease - No visible sheen on released waters. • All other contaminants - ANZECC 95% limits for protection of ecosystem health.	**Compliant** The Bluebook criteria (refer to SWMP) and ANZG 2018 (superseding ANZECC) criteria for 95% protection of marine species will be adopted should discharge to stormwater be required. Currently, offsite disposal to a licensed facility was the preferred option opposed to onsite treatment and discharge to stormwater or sewer.

2. Site Information

2.1. Site Identification

A summary of site identification and surrounding area is provided in **Table 2**.

Table 2: Site Identification	
Detail	**Information**
Site Address:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW.
Lot Parcel:	Part Lot 71 in Deposited Plan 1191648.
Site Area	3.2 hectares.
Site Owner:	NSW Government under care of Sydney Olympic Park Authority.
Local Council:	City of Parramatta.
Current Zoning:	RE1 Public Recreation Zone, under the State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009.
Current Site Use:	Pod B P5 Carpark (refer to **Figure 1**).
Proposed Future Use:	URBNSURF surf park (public recreation facility).
Surrounding Land Use	**North**: Hill Road, Millennium Parklands, the Newington Armory and a mixture of commercial and residential buildings. **South:** Haslams Creek, parklands, a conservation area, and Sydney Olympic Park facilities (including commercial buildings, stadiums and arenas). **East:** A carpark, recreational facilities (BMX track and archery centre) and wetland. **West:** Holker Busway, car park, vacant private land with some commercial operations beyond.

2.2. Environmental Setting

The environmental setting of the site is summarised in **Table 3**.

Table 3: Environmental Setting	
Detail	**Information**
Soils and Geology:	The Department Industry, Resources and Energy, 1983, 1:100,000 Geological Series Sheet 9130 (Edition 1) indicates that the site comprises of man-made fill including dredged estuarine sand, demolition rubble, industrial and household waste. This material is underlain by silty to peaty quartz sand, silt and clay with ferruginous and humic cementation and common shell layers. The geology encountered during the Environmental Site Investigation (ESI) conducted by WSP (Reference: 2270060A-CLM-REP-001 RevB) comprised mixed fill material from beneath surface asphalt/concrete to the maximum depth of the investigation at 3 metres below ground level (mbgl). The most predominant fill material units observed were a brown gravelly sand and a brown gravelly clay. Fill material comprised of anthropogenic materials was also observed in the northeast portion of the site. A geotechnical investigation undertaken by Galt Geotechnics (Reference: J1601146 001 L Rev0, dated 11 April 2017) reported the following uncontrolled fill (3-9 mbgl) overlying estuarine deposits (0-5 m thickness), overlying alluvial deposits (3-5 m thickness).

Table 3: Environmental Setting	
Detail	**Information**
Acid Sulfate Soils:	**NSW Planning Portal** A review of the City of Parramatta (Sydney Olympic Park) Local Environment Plan 2012 within the NSW Planning Portal indicated the site was in an area of "disturbed terrain" and did not prescribe any requirement for development consent (or controls) for carrying out work. However, a Class 2 Area ~250 m west of site was noted. **SEPP (State Significant Precincts) 2005 (Amended 2017)** The Acid Sulfate Soil Map (SEPP_SSP_SOP_ASS_001_20170607) for Sydney Olympic Park documents the site is within an area of "disturbed terrain". The Sydney Olympic Park Acid Sulfate Soil Risk Map describes "disturbed terrain" as filled areas of low-lying swamps for urban development. Other disturbed terrain includes areas which have been mined or dredged or have undergone heavy ground disturbance through urban development or construction of dams or levees. Soil investigations are required to assess these areas for acid sulphate potential. Additionally the following features in the vicinity of the site were noted: • Haslams Creek ~100 m south is classed as "high probability at or near the ground surface" area. • Nuwi Wetland ~200 m east is classed as "high probability within 1 m of the ground surface". **CSIRO ASRIS** A review of the CSIRO Atlas of Australian Acid Sulfate Soils indicated that the site is within an area of "low probability of occurrence" of acid sulfate soils. **Historical Image Review** A review of historical aerial images provided confirmed the USS Project is sited within a low lying coastal area with mangroves apparent on the banks of Wentworth Bay. The site and surrounding area have since been filled; however it is likely the estuarine deposits (PASS) remain in their natural condition. *An acid sulfate soil assessment is pending at the time of this SWMP being written. A site specific acid sulfate soil management plan, including controls for managing runoff, will be provided in the event acid sulfate soils are confirmed within deep (>5m) estuarine deposits underlying the site.* Also, please refer to Section 6 of the Waste Management Sub-plan for proposed Acid Sulfate Soil controls and treatment options.
Hydrogeology:	The nearby Newington and Bicentennial Park Wetlands (located approximately 30 m north of the site) are nationally significant, although based on the NSW Planning Portal the site is not considered to include wetlands. The site is surrounded by constructed drainage basins (Narawang Wetland to the north) and estuaries (Haslams Creek to the south) connecting to the tide-dominated Parramatta River (approximately 750 m east). Groundwater is likely to flow in a south easterly direction towards Haslams Creek and Parramatta River. Reported groundwater levels (Galt Geotechnics, 2017) were between 3.6-7.6 mbgl equivalent to 1-2 mAHD elevation.
Topography / Drainage:	Surface elevation across the site ranges from approximately 9 meters Australian Height Datum (mAHD) in the south to 5 mAHD in the north, with an approximate 3% grade. Surface water is expected to drain towards the stormwater drainage channels located in the centre and north-west of the site. Surface water and groundwater is anticipated to then flow east towards Haslams Creek approximately 150 m east of the site and the Parramatta River 750 m east of the site, which ultimately discharge into Wentworth and Homebush Bay.
Sensitive Receptors:	Sensitive environmental receptors are considered to include the environmental conservation area that surrounds the site and Haslams Creek and Parramatta River.

2.3. Site History

The Remediated Lands Management Plan (SOPA, 2009) documents the site as being within the Haslams Reach precinct where historical uncontrolled tipping of power station ash, demolition waste and small amounts of other waste occurred between the 1950's and late

1980's. Remediation of Haslams Reach took place between 1995 and 1997, which involved excavating and separating demolition waste into material suitable for reuse (defined as hardfill including bricks, concrete, etc.) and unusable material (defined as soft-fill including timbers, plastic, etc.).

The hardfill was crushed and placed in the northern region of the precinct[1] and a layer of geo-fabric was installed every 750 mm in the fill. The unusable material was placed with fly ash and other waste in a 4-5 m high disposal mound at the southeast corner of the precinct. An additional 5-6 m high disposal mound was constructed in the southwest corner of the precinct including contaminated soil imported from other Homebush Bay sites.

Both disposal mounds were capped with a 1–2 m thick layer of clean imported clay. A vertical cut-off wall and leachate collection drain were installed along the eastern and southern boundaries, with an additional clay barrier along the western boundary. The drain also receives leachate from nearby Archery Park. Leachate collects within the Atlantis drain and gravitates towards pump pit PP17, which is then discharged into a series of evaporation ponds located on the southern edge of the precinct. The depth of waste in the Haslams reach precinct reportedly ranges between 4-12 m.

An Environmental Site Investigation by Parsons Brinckerhoff Australia Pty Ltd (ref: 2270060A-CLM-REP-001 Rev B, 22 August 2016) did not encounter landfill waste within the URBNSURF site boundary and concluded the waste was likely contained within landscaped mounds approximately 70 m from the southern boundary.

[1] Note the placement location of the aggregate recovered from remediation of demolition waste within the Haslams Reach precinct was not specified within the RLMP.

3. Baseline Groundwater Quality

Sydney Olympic Park Authority undertake routine monitoring of groundwater quality within the Haslams Reach precinct biennially. The monitoring involves the collection of groundwater/leachate samples from the leachate drain and groundwater cut-off wall encompassing the precinct (as shown in **Figure 2**). Data for recent monitoring events provided by SOPA reported elevated concentrations of total suspended solids (TSS), metals, hydrocarbons, naphthalene, ammonia, and cyanide. Data for the June 2020 monitoring event compared to ecological criteria is summarised in **Table 4**.

Table 4: Baseline Groundwater Data

Location		Haslams Reach		Hill Road Cut-Off Wall				
Analyte	**Criteria[1]**	**06_MP2**	**06_MP5**	**07_MP1**	**07_MP3**	**07_MP4**	**07_Pit_2**	**07_Pit_1**
Oil and Grease	No visible	<5	<5	<5	<5	<5	<5	<5
pH (units)[2]	6.5-8.5	6.84	7.1	6.86	7.24	7.34	8.28	7.22
TSS	50	2500	98	170	66	100	67	120
Hardness ($CaCO_3$)[3]	500	1300	670	1400	1400	1000	190	850
Copper	0.0013	0.001	<0.001	<0.001	0.001	<0.001	0.003	<0.001
Lead	0.0044	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.015	0.38	0.0039	0.0018	0.0096	0.0034	0.61	0.035
TRH C_6-C_{10}[2]	<LOR	<20	<20	<20	<20	<20	<20	<80
TRH C_{34}-C_{40}[2]	<LOR	<100	<100	390	<100	160	200	<100
Naphthalene[2]	16	<10	<10	<10	<10	<10	<10	<40
Ammonia (as N)	0.910	6.8	2.2	16	1.4	6.1	<0.01	1.5
Cyanide (total)	0.004	0.002	0.004	0.005	0.01	0.008	0.002	<0.001

1. Proposed criteria based on ANZG 2018 Default Guideline Values (DGVs) for slightly to moderately disturbed marine environments and the "Blue Book" (pH).
2. All units in milligrams per litre (mg/L) except pH (no units), hydrocarbons (ug/L) and naphthalene (ug/L).
3. Hardness criteria applicable for freshwater receptors.

The groundwater quality is expected to be similar to leachate on the basis the Haslams Reach landfill is unlined (i.e. residual clay base) and hydraulically connected to groundwater. The groundwater within the development area may be further affected by isolated pockets of waste potentially present within the fill.

4. Groundwater and Leachate Management

4.1. Roles and Responsibilities

Responsibilities for implementation of the various activities described in the GLMP are summarised in **Table 5.**

Table 5: GLMP Roles and Responsibilities	
Role	**Responsibility**
URBNSURF:	• Engagement of suitably licensed contractors. • Engage an independent environmental consultant to undertake the necessary sampling to inform waste disposal and supervision to demonstrate compliance with the GLMP.
Principal Contractor:	• Implementation and provision of the GLMP to all site occupants, workers and contractors undertaking intrusive civil works. • Ensure all workers involved in intrusive works are adequately trained and inducted for works potentially encountering groundwater and/or leachate. • Review and ensure all SWMS provided by contractors (e.g. piling contractors) adapt controls for handling of leachate. • Hold necessary license or engage a licensed waste transporter • Track waste (groundwater or leachate disposed off-site disposal) maintaining copies of waste dockets from the licensed receiving facility. • Adherence to their Unexpected Finds Protocol.
Environmental Consultant:	• Undertake environmental sampling works and reporting to inform offsite disposal of groundwater or leachate where required. • Provide additional guidance on the methods used during civil works as required.

4.2. Timeline of Events

The civil works will not intersect groundwater or leachate except for piling works extending below the watertable. The duration of the piling works is expected to be 6-8 weeks undertaken during 2021 or as the programme requires. The principal contractor shall follow a suitable sequence of events, such as:

- Have an account/agreement/contract in place with the licensed waste facility intended to receive excess groundwater or leachate.
- Prior to commencing piling works, establish groundwater and leachate controls including holding tanks, submersible pumps, and hosing.
- Undertake/coordinate piling works including collection and transfer of excess leachate or groundwater to holding tanks.
- Notify the environmental consultant to undertake testing when disposal of groundwater or leachate is necessary.
- Arrange transport and acceptance of waste with the licensed facility.
- Demobilise groundwater and leachate management controls upon the completion of works.

4.3. Management Strategy

The overall approach to groundwater and leachate management for the USS Project has been developed with consideration to the SOPA Remediated Lands Management Policy, which has the following relevant requirements:

- Ensure that approvals issued under the Environmental Planning and Assessment Act 1979, the Authority's Parklands Plan of Management and the Authority's Work Permit System require compliance with relevant provisions of the Authority's Remediated Lands Management Plan.

- Development Applications associated with development of remediated land or contaminated sites at Sydney Olympic Park must take into consideration the requirements of State Environmental Planning Policy No 55 – (Managing Land Contamination).
- Ensure leachate transfer and treatment is conducted by appropriately licensed operators.
- Comply with the reporting and notification requirements of the Protection of the Environment Operations Act 1997 in responding to environmental incidents and in managing discharges to the Parramatta River.

4.4. NSW EPA Notice for Maintaining Remediation

The Haslams Reach precinct is not directly the subject of a current or former NSW EPA notice, but included within the Remediated Lands Management Plan (SOPA, January 2009) relating to eight waste containment areas within Sydney Olympic Park. The Haslams Reach precinct is described as an "Other Waste" area separate to the notified areas shown **Appendix A**.

The RLMP provides site specific controls for works on remediated landfills and management objectives for the Haslams Reach precinct primarily relating to SOPA's responsibilities, consideration of these aspects relating to the project are summarised in **Table 6**.

Table 6: SOPA Remediated Lands Management Plan

Objective	Management Target	Response
Comply with conditions of notice issued under Contaminated Lands Management Act 1997.	1. An auditor-approved Remediated Lands Management Plan is developed and implemented. Requirements of the Remediated Lands Management Strategy are applied to all management, operation, and development activities. 2. An auditor-approved site-specific environmental monitoring program is implemented 3. No alterations to landforms or excavations below 0.5 m without regulatory authority approval. 4. Adhere to the site Unexpected Finds Protocol should unidentified waste be discovered.	The USS project is outside of the waste disposal mounds described within Section 3.6.2 of the RLMP.
Maintain integrity of waste containment.	4. System components in good condition. 5. Capping has no evident surface cracks, potholes, depressions, fissures, erosion or exposure of waste. 6. Good vegetation cover on vegetated areas, with no evident vegetation die-off or bare patches. Soil irrigated as required to maintain cover. 7. No discoloured soil or pools of visually evident leachate at toe and batter (particularly after heavy rain when groundwater tables are elevated). 8. Proper reinstatement after excavations so erosion risk is minimised. 9. No offensive odour emanating from site.	The principal contractor will ensure civil works comply with the objectives of the RLMP, including: • Maintain adequate distance (e.g. greater than 3 metres) from leachate drain and structures. • No work, staging or track vehicles over waste containment areas (south of the site boundary). • Report exposed waste (outside of the development area) and manage in accordance with SOPA's RLMP and CEMP.
Prevent leachate migration to groundwater and surface water.	10. RL of leachate in pump pit 16 remains below RL of mean low tide in Haslams Creek (membrane installed to 101.5 gives an additional safety factor). 11. Leachate drains are operating freely- as confirmed by pump operational data and water level measurements in pump pits and leachate	**Not Applicable** The project will not interfere with the operation of the leachate collection drains.

Table 6: SOPA Remediated Lands Management Plan		
Objective	**Management Target**	**Response**
	drains. 12. Comparison chemical analysis of leachate storage tank and Pond HR8, and ANZECC guidelines for freshwater wetlands	
Prevent leachate overtopping from evaporation ponds into Haslams Creek.	13. Ponds do not overflow to Haslams Creek. 14. No scouring of pond embankments; aquatic vegetation in good condition. 15. Pond system storage capacity maintained.	**Not Applicable** The project will not interact with the operation of the leachate evaporation ponds.
Section 9: Management of Unexpected Waste. Waste may potentially be found during excavation of areas within Sydney Olympic Park that are not mapped as remediated lands.	If unexpected waste is encountered, the following procedure applies: • Restrict public access to the area. • Report the location and nature of the waste to SOPA for further investigation. • Assess occupational, public and environmental risks. Particularly consider potential explosive or toxic gases, toxic chemicals and buried unexploded ordinance. • Induct contractors on risks and procedures and provide PPE as required. • Replace unexpected waste in excavation or remove from site (to a licensed facility).	The principal contractor will adhere to the procedure for unexpected finds of waste outside of the containment areas.

4.5. Proposed Civil Works

The design levels for most of the civil structure are above 5 mAHD and will not intersect the watertable at 1-2 mAHD. The civil works expected to interact with the watertable include the advancement of approximately 1000 piles (referred to as a "rigid inclusions") of 0.5 m diameter to approximately -10 mAHD i.e. intersecting approximately 10 m of the unconfined aquifer. Once the piling hole has been advanced to the target depth and steel reinforcement is in place, cement is poured into the base of the hole through a tremie pipe lifting the groundwater in the process.

The quantity of groundwater arising from the piling works may vary depending on the permeability of the fill as a percentage of groundwater will percolate into the subsurface during the cement pour.

The piling will be undertaken from a piling pad and the ground will be graded to prevent uncontrolled surface run-off. Depending on piling location, all appropriate controls will be put in place dependant on the contaminants of concern, as required. For example, if asbestos works are being undertaken, any groundwater will be adequately captured and transferred to tanks and not directed to sediment basins. All sumps, gradients and sediment controls will be monitored and maintained to ensure no surface run-off. Further, if leachate is encountered, it will not be directed into the sediment basin and will be transferred to holding tanks for off-site disposal. Please refer to the following sections of this plan.

4.6. Dewatering Methodology

Groundwater that does not readily soak into the subsurface immediately surrounding the pile location shall be captured, in-line with section 4.5 (e.g. in a temporary pit adjacent the piling location) then transferred to a holding tank using a sump pump of nominal size (e.g. 50mm or 75mm diameter). As aforementioned, no surface run-off will be allowed to leave the piling area. Appropriate sediment controls will be installed and maintained in the immediate piling area.

Pre-treatment of suspended sediment should be completed prior to the transferring groundwater to the holding tank e.g. using filter cloth around pump inlets, a sediment tank,

or other means preferred by the contractor to achieve the desired result. The filter cloths should be disposed of as asbestos waste if work is being undertaken in an asbestos area. This is in-line with Section 5.4 of the Asbestos Management sub-plan.

The holding tanks shall have adequate capacity to accommodate the rate of excess groundwater requiring removal. PRM suggest two 20,000 Litre capacity tanks would be sufficient so that one tank remains available while the other tank is being emptied.

It is noted that all piling works are within the lagoon footprint. Please refer to civil design drawings. Please refer to the final Civil Design Drawing for specific detail.

4.7. Groundwater/Leachate Disposal

Considering the anticipated quantities, constituents requiring treatment and construction programme, disposal off excess groundwater/ leachate to an off-site treatment facility is seemingly the preferred method compared onsite treatment and discharge to stormwater or sewer. Please refer to Section 3.4 of the Soil and Water Management sub-plan for de-watering criteria.

The Environmental Consultant is to be notified when a holding tank is nearing capacity for sampling of collected groundwater/leachate. One groundwater sample per batch/tank will be analysed for the constituents in **Table 4** and compared to ANZG2018 criteria and baseline groundwater quality to confirm chemical concentrations prior to disposal. Note that elevated concentrations of total suspended solids (TSS) affect the treatment process and may incur an increased rate for disposal. As detailed in section 4.6 above and Section 5.4 of the Asbestos Management sub-plan, the water is filtered through cloths to capture any potential asbestos waste.

The Cleanaway facility within Sydney Olympic Park routinely receives leachate from the SOPA landfills. Cleanaway are licensed to receive and collect the groundwater (liquid waste) using tankers up to 20,000 L capacity. Contact details for the Cleanaway facility are:

- Address: Corner Hill Road and Pondage Link, Sydney Olympic Park NSW.
- Phone: 02 8748 0900.
- Website: www.cleanaway.com.au

All waste classification is in line with the details prescribed in Section 4 of the Waste Management sub-plan. Waste disposal receipts are to be retained and provided to the Environmental Consultant when requested.

4.8. License Requirements

WaterNSW Water Supply Work Approval (Not Applicable)

The proposed civil works do not meet the definition or "work" requiring a WaterNSW water supply works approval.

In the event a specified water supply work (i.e. construction and operation of extraction wells) is required to enable the civil works. The contractor shall obtain a water supply works approval for construction dewatering using the application form and user guide available via the WaterNSW website.

4.9. Groundwater Drawdown Impacts

Dewatering has the potential to induce ground subsidence on neighbouring properties through increased vertical stress within the ground. The proposed civil works do not require dewatering or lowering of the watertable.

In the event dewatering (lowering) of the watertable is required to enable the civil works a structural engineer (or RICS accredited building surveyor) should be engaged to assess potential settlement impacts on neighbouring properties and structures. The Environmental Consultant should be consulted to provide an updated GLMP. Any lowering of the watertable

will require SOPA's approval.

5. Response Procedures

5.1. Operational Response Process

Where uncontrolled discharge of groundwater or leachate from site is suspected to have occurred, the following will be undertaken:

- The Principal Contractor and site manager/supervisors will assess the source and extent of the groundwater/leachate discharge.
- The Principal Contractor will undertake or authorise an investigation and provide a detailed report to URBNSURF and SOPA within seven days of the incident.
- Any corrective action will be recorded in the site Safety Environment Quality (SEQ) folder database and reported to the Health Safety Environment Quality (HSEQ) Manager.
- Sydney Olympic Park Authority should be notified as soon as practicable (ideally within 24 hours) in accordance with the Environmental Pollution Incident Policy, 2012 (amended 2019).

5.2. Complaint Response

All complaints received in relation to groundwater/leachate will be responded to in accordance with the Stakeholder Communication and Consultation Procedure. This provides details on how to receive, handle, respond to and record and action any community complaints.

Upon receipt of a complaint from the community, preliminary investigations will be undertaken, by the Principal Contractor in consultation with URBNSURF and the Environmental Consultant, as soon as practicable to determine the likely causes of the complaint. A response will be provided as soon as practicable, which may include the provision of relevant monitoring data.

5.3. Complaints Register

All community complaints must be recorded on a complaint register and the HSEQ manager must be notified of all complaints received.

6. Limitations

This report is confidential and has been prepared by Progressive Risk Management (PRM) for URBNSURF Sydney Pty Ltd (the client) in accordance with the terms and conditions provided within the Consultancy Agreement between the client and PRM. This report may only be used and relied upon by the client and must not be copied to, used by or relied upon by any person other than the client. If a third party (limited to only the owner of the property from the client) wishes to rely on this report, they will need to enter a Third-Party Reliance Deed with PRM.

This report is limited to the observations made by PRM and information available and was limited to a desktop study only.

All results, conclusions and recommendations presented should be reviewed by a competent person before being used for any other purpose. PRM accepts no liability for use of, interpretation of or reliance upon this report by any person or body other than the client. Third parties must make their own independent inquiries.

This report should not be altered amended or abbreviated, issued in part or issued incomplete without prior checking and approval by PRM. PRM accepts no liability that may arise from the alteration, amendment, abbreviation or part-issue or incomplete issue of this report. To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by PRM and this report are expressly excluded (save as agreed otherwise with the client).

PRM shall bear no liability in relation to any change to site conditions after the date of this report. This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope and limitations defined herein (Scope of Works). Should information become available regarding conditions at the site including previously unknown sources of contamination, PRM reserves the right to review the report in the context of the additional information.

Figures

Image source: Metromaps.com (accessed 18 February 2021)

~30 m

PROGRESSIVE RISK MANAGEMENT

LEGEND					
Approximate Site Boundary		Report Name:	Groundwater and Leachate Management Plan		
Inferred Area of Waste (SOPA 2020)		Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW		
Inferred Area of Waste / Emplacement Cell (PB 2016)		Client Name:	URBNSURF Sydney Pty Ltd		
		Project Reference:	P034987.002		
		Figure Number:	1	Figure Name:	Site Layout

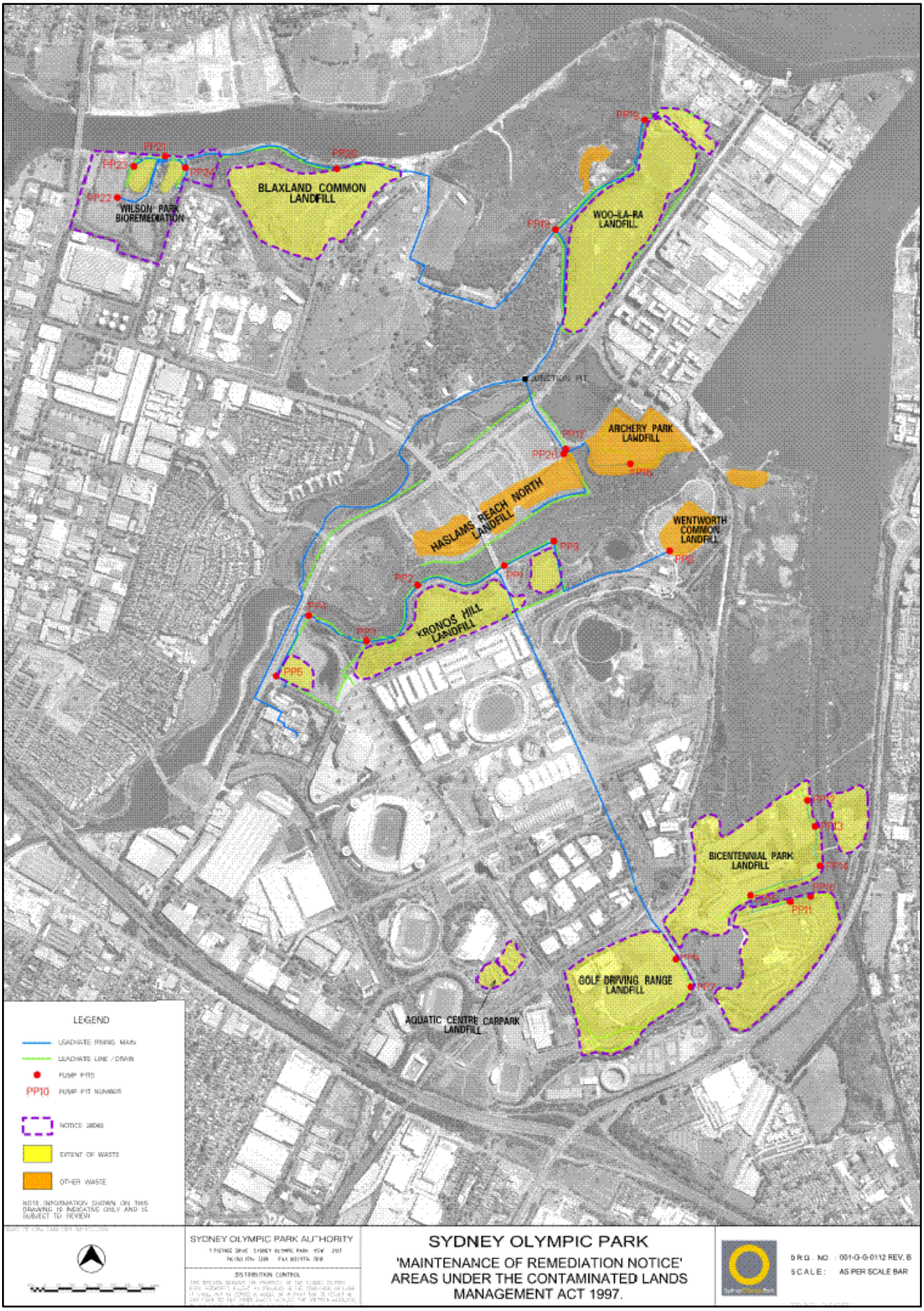
Image source: Sydney Olympic Park Authority, Landfill System, Ref:007-G-G-001 Rev N, 28 May 2020

~120 m

PROGRESSIVE RISK MANAGEMENT

LEGEND					
Approximate Site Boundary		Report Name:	Groundwater and Leachate Management Plan		
Inferred Area of Waste (SOPA 2020)		Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW		
		Client Name:	URBNSURF Sydney Pty Ltd		
		Project Reference:	P034987.002		
		Figure Number:	2	Figure Name:	Landfill Systems

Appendix A – Maintenance of Remediation Notice Areas


BLAXLAND COMMON LANDFILL
WILSON PARK BIOREMEDIATION
WOO-ILA-RA LANDFILL
JUNCTION PIT
ARCHERY PARK LANDFILL
HASLAMS REACH NORTH LANDFILL
WENTWORTH COMMON LANDFILL
KRONOS HILL LANDFILL
BICENTENNIAL PARK LANDFILL
GOLF DRIVING RANGE LANDFILL
AQUATIC CENTRE CARPARK LANDFILL
PP1
PP2
PP3
PP4
PP5
PP6
PP7
PP8
PP9
PP10
PP11
PP12
PP13
PP14
PP15
PP16
PP17
PP18
PP19
PP20
PP21
PP22
PP23
LEGEND
LEACHATE RISING MAIN
LEACHATE LINE / DRAIN
PUMP PITS
PP10 PUMP PIT NUMBER
NOTICE 28048
EXTENT OF WASTE
OTHER WASTE
NOTE: INFORMATION SHOWN ON THIS DRAWING IS INDICATIVE ONLY AND IS SUBJECT TO REVIEW
SYDNEY OLYMPIC PARK AUTHORITY
SYDNEY OLYMPIC PARK
'MAINTENANCE OF REMEDIATION NOTICE' AREAS UNDER THE CONTAMINATED LANDS MANAGEMENT ACT 1997.
DRG. NO. : 001-G-G-0112 REV. B
SCALE: AS PER SCALE BAR

Appendix C2 (i) C5 Major Events Management Plan

MAJOR EVENT MANAGEMENT PLAN FOR

URBNSURF Sydney Project

URBNSURF (Developments) Sydney Pty Ltd

MAJOR EVENT MANAGEMENT PLAN AUTHORISATION AND CONTROL

The Major Event Management Plan (MEMP) is authorised internally by the Project Manager and accepted by

URBNSURF Pty Ltd Representative prior to implementation.

REVISION

This MEMP shall be reviewed at least six (6) monthly and approved by the Project Manager, with all updates

communicated to workers as required. The Project Manager shall ensure the MEMP remains controlled and

up-to-date

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1 INTRODUCTION

1.1 PURPOSE

The Major Event Management Plan (MEMP) describes our approach to the management of major events on

the Open water Surf Sports Lagoon facility for URBNSURF Sydney (The Project). It will support Lipman in

planning construction activities in Sydney Olympic Park and outline the approach to ensure that there is no

disruption to major events.

The MEMP outlines Lipman's approach to major events management to ensure the responsibilities of our team

and those of URBNSURF and other contractors in relation to this project are understood. The Major Events

Management Plan will be approved by SOPA's director, Planning and Environment, prior to the

commencement of Works.

1.2 OBJECTIVES

The objectives of this plan and activities is to ensure construction works are managed appropriately in order

to eliminate any adverse effects to Major Events in Sydney Olympic Park, including:

 Ensure regular communication held with SOPA;

 Keep the SOPA informed about the project including construction activities, work programs and associated

impacts and ensure open and proactive management of issues and communication;

 Identify procedures and tools and roles and responsibilities to enable the Lipman team and the nominated

Community Relations Manager (CRM) to deliver this plan to the best of their ability;

 Enhance and maintain relationships between the SOPA and project;

 Ensure SOPA is advised n advance of any access for construction/delivery vehicles during major event periods.

2 PROJECT CONTEXTS AND OBJECTIVES

2.1 CONTEXT AND OBJECTIVES

Lipman will, on behalf of URBNSURF (Developments) Sydney Pty Ltd, be constructing an open water surf

sports lagoon facility within Sydney Olympic Park (SOP). It is located within SOP which is 13km west of Sydney

Central Business District (CBD) and 6km East of Parramatta.

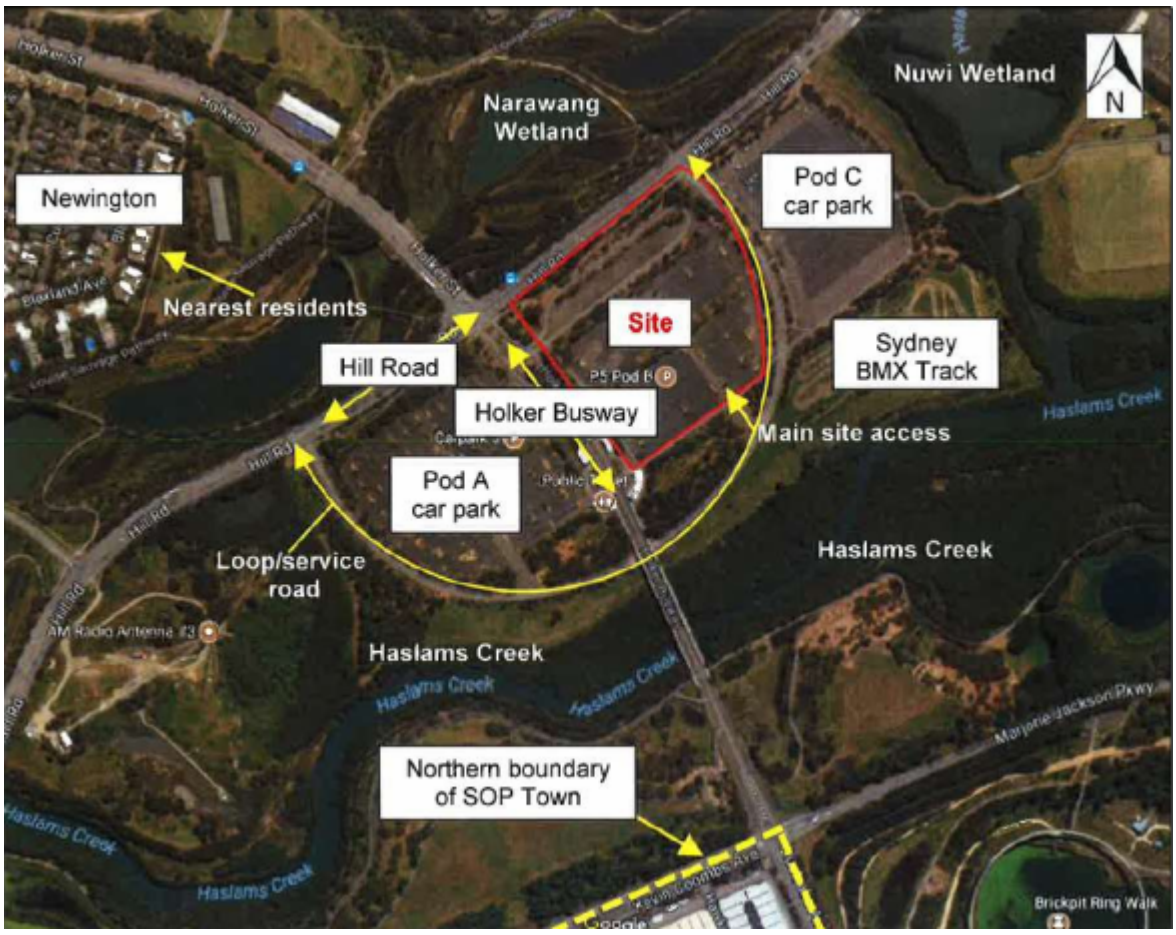
The site is located within Pod B P5 Carpark, Hill Road and is located at the western edge of SOP, a large

sporting, cultural and leisure precinct within Western Sydney. The site is on the southern side of Hill Road at

the junction of Hill Road and Holker Busway within close proximity to bus routes, pedestrian and bicycle routes,

and the future Parramatta light rail corridor.

Location of the project



The project involves the construction of a world class sport, recreation, leisure, tourism and event facility and

features a “Wavegarden” surfing lagoon. The project will deliver a major recreational and tourism facility to the

Western Sydney region.

The key element includes:

 Open water lagoon including a wave generator

 Amenities buildings

 Outdoor lagoon side events area

 Events service access

 Retention of existing access and 159 parking spaces from the existing Pod B

 Staff and public car parking areas

 Service yards

 Landscaping

2.2 PHASE AND TIMING

Project staging is:

 Demolition of a portion of the existing carpark

 Bulk earthworks and site preparation work

 Construction of an open water surf sports lagoon that features a “Wavegarden” surf lagoon

 Construction of a partly two (2) storey building in the south-west corner of the site which will house

amenities, administration, food and drink facilities and surf academy

 Landscape and associated works

Construction hours will be 7am to 5pm, Monday to Saturday, no works will be carried out on Sundays or public

holidays. There are no out of hours work proposed for the project.

2.3 REQUIREMENTS

Lipman will comply with all SOPA and URBNSURF major event management requirements as outlined in the

tender document. We understand that the Codes and Standards relevant to major event management include:

- Privacy and Personal Information Protection Act 1998; (NSW);
- SOPA's Event Management Strategy;
- Sydney Olympic Park Authority (SOPA) Act 2001
- Development Consent, section 89E of the Environmental Planning and Assessment Act 1979

3 KEY RESPONSIBILITY FOR MAJOR EVENTS MANAGEMENT

The Community Relations Manager (CRM) holds primary responsibility for management of major events in

relation to construction works on the Project. They will be on-site during normal working hours for the duration

of the Contract.

Project team member	Responsibilities
Community Relations Manager	Serve as key point of contact for URBNSURF and SOPA communications representative Serve as key point of contact for stakeholders, including the management of all enquiries and complaints, available 24 hours, 7 days a week Attend weekly communication meetings with URBNSURF Monitor and maintain project email address and phone number Manage the delivery of all necessary communication activities Ensure project compliance with all processes and procedures outlined in the MEMP Proactively identify and mitigate all risks to the Project, URBNSURF and SOPA Maintain regular contact with SOPA to ensure all Major Events are captured by the project and managed accordingly.
Project Manager	Assist with management of major events and relationship with SOPA and URBNSURF as appropriate Aid with resolution of issues when requested Provide appropriate funding and resources to support successful implementation of MEMP Provide technical content for vents management materials when requested Provide timely approval of events management materials and reports
Project Engineer	Provide technical content for events management materials when requested Aid at community events and media events when requested

Supervisory staff (superintendent, foremen etc.) 	Ensure compliance with major events management procedures Ensure appropriate workforce behaviour

4 EVENT MANAGEMENT

It is acknowledged that SOPA will arrange and manage all official events at SOP. Lipman will provide all relevant

information regarding construction to URBNSURF where requested by SOPA. SOPA will be responsible for

coordinating all events and notifications around the events.

Lipman will hold on-going discussions with URBNSURF regarding dates and commencement of any events

and construction activities at SOP as well as managing construction works around events held in SOP.

Lipman understands that there will be major events held at SOP during the construction of the Project. These

events need to be managed appropriately by working together with SOPA and URBNSURF. Lipman will ensure

conflicts with major events held in SOP are avoided where possible.

Lipman will provide an Events Management Plan (EMP) for any events within SOP which exceeds 500 people

or more. The EMP is included in Appendix B and will identify and ensure a plan is in place to manage events

in SOP.

Management of complaints, enquiries and any other community related issues will be handled in accordance

with the Community and Stakeholder Liaison Management Plan.

4.1 SECURITY AND STAFF MANAGEMENT

All security personnel for SOP events will be managed by SOPA. Lipman will seek advice from URBNSURF

and SOPA if there is a requirement around site security, for e.g. presence of security on site to stop crowds

jumping the fence to gain access to site.

4.2 RISK AND SAFETY PLAN

The Lipman team will employ a systematic approach to identifying and managing risk, hazard and safety

concerns across all aspects of the Event.

4.3 TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN

Lipman will engage a suitably qualified and experienced traffic personnel to create a traffic and pedestrian

management plan to be implemented during events. This plan will help to minimise impacts on traffic,

pedestrian and cyclist access, and the amenities of the surrounding environment. It will also address

management of car parking, vehicle routes and queues.

4.4 EVENT LAYOUT AND OPERATION

Lipman will seek clarity from SOPA around any events in SOP. Lipman understands that SOPA will communicate

and work closely with the project team regarding layout implications, operation and duration of events.

4.5 CONSTRUCTION NOISE MANAGEMENT

Noise Management Plan has been identified and prepared by a qualified expert as part of the Construction

Environmental Management Plan (CEMP). All noisy activities generated from construction will be managed by

the guidelines set out in the CEMP.

4.6 ROAD CLOSURES

Lipman will work closely with URBNSURF and SOPA around any road closures relating to construction

activities. The construction activities are contained within SOP site location thus shouldn’t impact on any roads.

5 KEY EMERGENCY AND SOPA CONTACTS

Table 5: Emergency Contact

Organisation	Organisation Contact
Transport Management Centre (TMC) 131 700	131 700
City of Parramatta - After Hours Emergency (02) 9806 5050	(02) 9806 5050
SES Flood Safe	132 500
Auburn Police Emergencies	000 (02) 9646 8699
EPA – Pollution incident	(08) 8204 2004
Sydney Water	1300 143 734
Health NSW	(02) 9391 9000
Red Cross	(02) 9229 4272

Table 6: SOPA Contact

Organisation	Organisation Contact
SOPA, General Enquiries Monday – Friday, 8:30am – 5pm	(02) 9714 7888
SOPA - Security	(02) 9714 7700
ANZ Stadium	(02) 8765 2000
Qudos Bank Arena	(02) 8765 4321 info@qudosbankarena.com.au
Quay Centre	(02) 9714 7600 quaycentre@sopa.nsw.gov.au
Royal Agriculture Society of NSW (Sydney Showground)	(02) 9704 1111

APPENDIX B – EVENT MANAGEMENT PLAN

EVENT REQUIREMENTS

Event place and time

Event name:
Event address:
Event details - list the type of activities:
Date and event start time:
Date and event finish time:
Estimated number of people attending:

Construction contact during events

Construction contact on the day of event: Lipman CRM details will be provided to SOPA for any community or public queries and Project Manager details for any other construction queries.	
Phone:	Email:
How will Lipman communicate between event stakeholders: What will be the construction protocols around events? List them below:	

Bump in and bump out requirements

How will site materials be transported in and out of SOP? List the type of equipment, personnel and any other relevant information
Will there be any road/street closures required for the event? Yes/No If yes, what is the road/street name?
Has the relevant authority been contacted? Yes/No
Has a permit been obtained? Yes/ No If yes, permit number is:
Do you need security for this event? Yes/No If yes, please include company name, licence details, security personnel at

Risk and Safety Plan

The Lipman team will employ a systematic approach to identifying and managing risk, hazard and safety concerns across all aspects of the Event.

Traffic and Pedestrian Management Plan

Lipman will engage a suitably qualified and experienced traffic personnel to create a traffic and pedestrian

management plan to be implemented during events. This plan will help to minimise impacts on traffic,

pedestrian and cyclist access, and the amenities of the surrounding environment. It will also address

management of car parking, vehicle routes and queues.

Event layout and operation

Lipman will seek clarity from SOPA around any events in SOP. Lipman understands that SOPA will communicate

and work closely with the project team regarding layout implications, operation and duration of events.

Construction Noise Management

Noise Management Plan has been identified and prepared by a qualified expert as part of the Construction

Environmental Management Plan (CEMP). All noisy activities generated from construction will be managed by

the guidelines set out in the CEMP.

Appendix C2 (j) Traffic and Pedestrian Management Sub Plan

TRAFFIC MANAGEMENT PLAN

FOR

URBNSURF (DEVELOPMENTS) SYDNEY

DOCUMENT REVISION SUMMARY

Rev	Date of Approval	Approved & Accepted By	Title	Signature
2	23/07/2021	F. Turnbull	Project Manager	
3	31/08/21	F. Turnbull	Project Manager	

PROJECT REVISION SUMMARY

Amendment ID	Date of Amendment	Section Ref	Brief Amendment Description	Approved By

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1 INTRODUCTION

This Project Traffic Management Plan has been prepared by Ertech to aid in the management and delivery of the construction of the URBNSURF (Developments) Sydney. Construction activities will be carried out in accordance with the requirements of AS/NZS ISO9001-2008.

The purpose of the TMP is to be a high-level document to identify and define the requirements, processes and responsibilities of the traffic management during the construction of the project in accordance with the Traffic Control at Worksites Manual (TCWS), Transport for New South Wales (TfNSW), SOPA Development Consent documents and Ertech's internal policies and procedures. Ertech's Traffic Management Policy can be found in Appendix A.

The TMP will identify the staging and construction sequences to detail how the construction works will be integrated into the operation of the road network as well as how all road users will be accommodated to maintain road user safety and minimise disruption. This detail is outlined under four (4) main headings.

- Traffic Management Strategy and Processes.
- Operational Requirements.
- Traffic Communications.
- Recording and Reporting

1.1 SCOPE OF WORKS

The work under the single Contract include:

- Mobilisation & Site Establishment
- Site Strip and Preparation
- Diversions, Decommissioning and Re-Commissioning of Existing Site Services
- External Services Lead Ins and Main Inground Services Runs
- Bulk Earthworks
- Ground Improvements – Rigid Inclusions (D&C) Separable Portion
- Retaining Walls Site location

URBNSURF (Developments) Sydney is located on the corner of Hill Road and Holker Busway intersection.

1.2 CONTRACT PARTICULARS

Contract Number	
Project Title	URBNSURF (Developments) Sydney
Principal Contractor	Ertech Pty Ltd
ABN	46 094 416 887
Construction Type	Construct only
Date of Commencement	
Date of Completion	

2 REFERENCES

Please refer to the following documents for further relevant information regarding this Traffic Management Plan:

- AS 1742.3 – 2002, Traffic Control Devices for Works on Roads.
- QA Specification G10.
- SOPA Project Development Consent.
- SOPA Environmental Assessment Report
- Traffic Control at Worksites Manual – Version 5.
- WHS Act and Regulations 2011
- Roads Act 1993 and Roads Regulations 2018
- Road Occupancy Manual
- Austroads Guide to Road Safety
- Ertech Pty Ltd Safety, Quality and Environmental Plans

3 GLOSSARY OF TERMS

Abbreviation	Extended Text
AS1742.3	Manual of Uniform Traffic Control Devices
SOP	Sydney Olympic Park
SOPA	Sydney Olympic Park Authority
CSMP	Community Stakeholder Management Plan
CRM	Community Relations Manager
PMP	Pedestrian Management Plan
QMP	Quality Management Plan
RASS	Radar Activated Speed Signs
RCC	Road Construction Contract
ROL	Road Occupancy Licence
SZA	Speed Zone Authorisation
TCP	Traffic Control Plan
TCSM	Traffic Control Site Manager
TFNSW	Transport for New South Wales
TMC	Transport Management Centre
TMP	Traffic Management Plan
TCWS	Traffic Control at Work Sites Manual
VMP	Vehicle Management Plan
VMS	Variable Message Sign

4 CONTACT LIST

Role	Name	Contact
PROJECT MANAGER	**Fraser Turnbull**	**0411 289 068**
QUALITY & TRAFFIC CONTROL SITE MANAGER	**Yogi Yoganathan**	**0408 360 741**
ENVIRONMENTAL SITE REPRESNTATIVE	**Grant Fletcher**	**0416 120 963**

WHS SITE SAFETY REP	**Rodney Errington**	**0428 018 108**
SITE SUPERVISER	**Justin Kemp**	**0450 849 842**
COMMUNITY LIAISAN REPRESNTATIVE	**Rama Sapkota**	
UTILITY WORKS COORDINATOR	**Bryan King**	**0418 772 986**
EARTHWORK ENGINEER	**Vincent Elzains**	**0428 097 932**
EMERGENCY RESPONSE NOMINATED PERSON		
POLICE, AMBULANCE AND OTHER EMERGENCY SERVICES		
TFNSW AUTHORISED DELEGATE		
TFNSW SURVEILLANCE OFFICER		
TFNSW REGIONAL TRAFFIC COMMANDER		
TFNSW TRANSPORT MANAGEMENT CENTRE		

5 TRAFFIC MANAGEMENT PRACTICES

5.1 GENERAL

The construction of the URBNSURF (Developments) Sydney– Open Water Surf Lagoon Facility Project has the potential to disrupt the existing vehicular, pedestrian and cyclist traffic along the following Road;

- Hill Road
- Holker busway
- Loop Access Road

Minimisation, and where possible. elimination of traffic disruption along with the implementation of appropriate control measures are the key strategies in the successful delivery of the traffic management for the project which are detailed as follows:

- Installation of project approach, warning and departure signage to identify the overall project work extents.
- Installation of clear and consistent signage, line marking and delineation to warn and guide road users through the project worksite.
- Deployment of Variable Message Sign (VMS) boards to advise road users of upcoming major traffic disruptions (if required).
- Isolation of the physical construction works with concrete barriers and implementation of short-term contraflows (if required)
- Frequent communication with Transport for New South Wales (TfNSW), Sydney Olympic Park Authority (SOPA) and council will be carried out to identify and resolve any potential traffic management conflicts
- Further intermittent communication with TfNSW and SOPA will be carried out to inform of TCP implementations, traffic incidents and breakdowns
- Frequent communication with operation and community stakeholders to provide advance notification of traffic arrangement changes
- Long Term Construction Traffic Control Plans
- Short Term Traffic Control Plans (TCP's) will be developed by an accredited person who holds a current Design and Inspect Traffic Control Plans or a qualified person who holds the new qualification level that incorporates Select and Modify Traffic Control Plans and Design and Inspect Traffic Control Plans.
- TCPs will be approved by the TCSM prior to submission to relevant road authority.

5.2 TRAFFIC RISK MANAGEMENT

Construction activities on or adjacent to roadways carry inherent levels of varying risk. As a result, detailed risk assessments will be undertaken to quantify the level of risk and determine appropriate mitigation strategies. This process aligns with Ertech's internal safety management procedures and ISO: 31000 (2009):

- Identify the Hazard
- Assess the Risk
- Calculate the Risk Level
- Determine the Control Measures
- Implement the Control Measures
- Monitor and Review Hazards, Risks and Control Measures.

5.3 TRAFFIC CONTROL PLAN SUBMISSION PROCESS

All TCPs, PMP and VMPs will be approved by the TCSM prior to submission to the relevant approving authority. Approval from all other relevant jurisdictions shall be provided to the superintendent prior to implementation of the Traffic Control Plan. Upon internal approval, the TCSM shall forward the proposed TCP inclusive of;

- Types and locations of permanent regulatory (R series) and warning (W series) signs.
- Types and locations of temporary signs (T series) including advance warning signs, and variable message signs (VMS) and radar-activated speed signs.
- Locations of permanent and temporary traffic signals.
- Locations of any required Traffic Controllers.
- Locations and lengths of taper and safety buffer areas.
- Locations of safety barrier systems including end terminals.
- Pedestrians and cyclists' paths facilities (including additional shoulder widths or other provisions).
- Locations of entry and exit gates to work areas, individually numbered and signposted including details of entry and exit gate acceleration and deceleration lanes.
- Details of access to adjoining properties, car parking areas, and side roads.
- Pavement marking details, including types of delineation required, turning arrows, stop/holding lines and other road markings, types and positions of raised pavement markers and other delineation devices.
- Locations of temporary lighting.
- Locations of bus stops (if any), parking and associated facilities.
- Locations and type of containment fences and exclusion zones relating to worker and other users safety, and will
- Include a statement with each TCP describing the circumstances for which the TCP is applicable. The TCSM is to verify each TCP complies with the requirements of this Specification.

TCP and VMP submissions will be submitted based on a 3-day review period, All submissions will be accompanied with a priority list to ensure reviews are carried out in order of importance. Approval must be obtained prior to implementation .

5.4 APPROVAL PROCESS

Prior to commencement of use, TMP must be approved by SOPA's Director, Environmental and planning, prior to the issue of the Final Occupation Certificate – Schedule of approval points for traffic management as details below;

Process Details:	**Any work controlling and directing traffic on the site**
Submission Details:	The names of your proposed Traffic Controllers, and their qualification details such as registration numbers and expiry dates of their Cards.
Approval:	The Client will consider our proposed traffic control personnel, prior to approve the personnel.

Process Details:	**Submission of Traffic Management Plan (TMP), Traffic Control Plan (TCP)/Pedestrian Movement Plan (PMP)/Vehicle Movement Plan (VMP)/ROL**
Submission Details:	submission of TCP, PMP, VMP and Approved ROL (from TMC) with TMP for the client review and approval.
Approval:	The Client will consider the submitted documents, including resources proposed, prior to approval.

6 ROLES, RESPONSIBILITIES AND ACCOUNTABILITIES

6.1 PROJECT MANAGEMENT

6.1.1 PROJECT MANAGER

The responsibilities of the Project Manager regarding traffic management include:

- The Project Manager will be the primary 24/7 contact for all traffic related matters
- Be familiar with the requirements of the TMP and internal traffic management system
- Management of the TCP and VMP scoping, development, submission and implementation processes
- Management of the traffic recording and reporting procedures
- Management of the traffic incident and emergency response procedures
- Management of the communication with operational and community stakeholders
- Management of the traffic management activities with the TCSM and supervisors
- Management of traffic non-conformances
- Maintenance of the operational and community stakeholder contact details
- Maintenance of the out of hours contact representative details
- Attend regular project and traffic meetings for the purpose of updating project team on programming and ensuring the requirements of the TMP are met.

6.1.2 TRAFFIC CONTROL SITE MANAGER

The Traffic Control Site Manager (TCSM) shall be a full-time, site-based member of the site management team.

The TCSM shall be qualified, as a minimum, in the RMS “Design and Inspect Traffic Control Plans” or “Prepare a Work Zone Traffic Management Plan” course (i.e. hold a current Orange Card) and have recent experience (minimum five years) in traffic management on road construction sites of equivalent complexity to the current Contract.

The TCSM has the authority to stop work on any activity if it as necessary to prevent traffic accidents, or to comply with the directions of the Principal, TMC or Police.

Reporting to the Project Manager, the responsibilities of the TCSM include:

- Ensuring that the approved traffic management measures are implemented and maintained in accordance with the approved plans
- Carrying out daily inspections of the traffic control measures (at day and night and in a range of weather conditions) to ensure that they are effective;
- Amending and updating the plans, as required, to ensure that they remain current as the work progresses
- Identifying situations where traffic congestion, or unsafe conditions for vehicles, cyclists, pedestrians and workers, are occurring and providing recommendations for improvement
- Maintaining current copies of the Traffic Management Plan, Traffic Staging Plans, Traffic Control Plans, Vehicle Movement Plans, Pedestrian Movement Plans, Lane Occupancy Licences and Speed Zone Authorisations, and their controlled distribution
- Liaising with the Principal and other authorities such as Sydney Olympic Park Authority (SOPA), Transport Management Centre (TMC), New South Wales Police and local Councils on traffic management matters for the Site
- Facilitating regular traffic awareness training and giving toolbox talks to site personnel
- Developing TMP's and TCP's and obtaining required approvals from the Principal, Sydney Olympic Park Authority and other relevant authorities of all traffic management measures on site
- Arranging traffic control audits and implementing audit close outs
- Regularly monitoring the traffic flow to ensure compliance with this Specification
- Updating the project monthly report on all traffic related measures
- Recording and reporting on all traffic accidents
- Weekly reporting compliance and noncompliance with ROL conditions, speed management and queue management (if required)
- Traffic consultation with local businesses and residents in consultation with your Community Relations Manager
- Arranging the design and certification of site entry and exit facilities to ensure compliance with the nominated main line speed requirements both within and outside ROL licence time periods
- Undertaking traffic-based risk assessments of the Works
- Record and distribute all minutes relating to traffic workshops, traffic meetings and such.

6.1.3 EARTHWORK ENGINEER

The responsibilities of Project and Site Engineers include:

- Assist in the scoping of TCPs and VMPs
- Assist in ensuring compliance with TMP, TCWSM, AS1742.3 and project specifications
- Assist in the programming of TCP and VMP implementations
- Assist in the maintenance of traffic management registers including TCP and VMP Device List, traffic control bookings, excessive dimension transports, traffic issues and traffic incidents
- Assist in the notification to TfNSW of all traffic incidents and breakdowns
- Procurement of required traffic control devices
- Booking of all traffic control personnel
- Assist in the identification of non-conformances

6.1.4 SITE SUPERVISOR

The responsibilities of the Superintendents and Supervisors include:

- Assist in the scoping of TCPs and VMPs
- Assist in ensuring compliance with TMP, TCWS Manual, AS1742.3 and project specifications
- Assist in the programming of TCP and VMP implementations
- Supervision of worksite to ensure compliance and maintenance of TCPs and VMPs
- Coordination of daily traffic routine tasks and recording keeping
- Assist in the identification of non-conformances.

6.2 TRAFFIC CONTROL PERSONNEL

Ertech are authorised under Section 6 of the Roads Regulation 2008 (NSW), to appoint Traffic Controllers solely for the purposes of the Contract to provide for the safe movement of traffic around, past or through the work site. Any such appointment shall cease upon the completion of traffic control work under the Contract, or the termination of the Contract, whichever is the earlier. Ertech will ensure to utilise Traffic Control Companies having qualifications as per TfNSW requirements and all the details of the companies' personnel traffic control certifications will be sent to SOPA for their review.

6.2.1 REGISTRATION OF TRAFFIC CONTROL ORGANISATION

The organisation undertaking the traffic control must be registered under the *RMS Registration Scheme Category G "Traffic Control".*

6.2.2 QUALIFICATIONS OF TRAFFIC CONTROL PERSONNEL

Persons performing traffic control roles shall have attended and be qualified in the traffic control training courses relevant to their roles as per Table 1 below:

Table 1 – TC Qualifications

Traffic Control Roles	RMS Traffic Control Training Course
Control traffic using "Stop/Slow" bat	Traffic Controllers (Blue Card)
Set up and work with Traffic Control Plans drawn up by others	Implement Traffic Control Plans (Yellow Card)
Select and make minor modifications to standard RMS Traffic Control Plans to suit work locations	Select and Modify Traffic Control Plans (Red Card)
Design new Traffic Control Plans and inspect setting out of traffic controls at work sites	Design and Inspect Traffic Control Plans/ ***Prepare a Work Zone Traffic Management Plan*** (Orange Card)

Traffic Controllers must always carry their Blue Cards on their person when controlling traffic and must always carry their Yellow Cards on their person when setting up traffic controls.

6.2.3 SAFETY VESTS AND EQUIPMENT

Ertech shall ensure that all nominated Traffic Controllers are provided with high visibility fluorescent safety vests complying with AS/NZS 4602, clearly bearing the words "Authorised Traffic Controller". Traffic Controllers will wear the vest as an outer garment only when controlling traffic for the purposes of the Contract, and not at other times. During poor light conditions or at night, Traffic Controllers will be equipped with illuminated red wands when directing direct traffic.

7 OPERATIONAL REQUIREMENTS

7.1 PROJECT SPECIFIC RESTRICTIONS AND ADDITIONAL REQUIREMENTS

As detailed in Annexure A2, the following specific requirements for control of road traffic apply for the URBNSURF (Developments) Sydney;

Any works that affects traffic on, Hill Road, Holker Busway and Loop Access Road must be planned in coordination and consultation with the Transport Management Centre (TMC) and/ or Sydney Olympic Park Authority as applicable.

Except as provided for in an approved ROL the following specific requirements for traffic management apply for this Contract:

- The number and width of existing traffic lanes must be maintained at all times.
- Existing speed limits are to be maintained at all times.
- Works that would require reduction in traffic capacity on Hill Road, Holker Busway and Loop Access Road (i.e. lane closure, speed reduction, etc.) will only be considered at day between the hours of 9:00 and 16:00 and night between the hours of 21:00 and 05:00 subject to TMC endorsement.
- Access to properties and businesses must be maintained at all times except where specifically agreed with the relevant property / business owner / occupier.
- Suitable vehicular and pedestrian access must be provided to completed works 24hours a day, seven days a week, for the public, maintenance staff and emergency services
- Provide appropriate delineation, advance warning signs and speed zoning at all times in all conditions.
- All traffic delays or incidents resulting in traffic delays greater than those experienced during the typical operation of Hill Road and Holker Busway prior to the commencement of these works are to be reported immediately to TMC.
- You must allow emergency service vehicles access through the work area at all times.
- Heavy vehicle traffic generated during construction must be constrained to the regional network as much as possible.
- Movement of construction materials (haulage and deliveries) must be scheduled to minimize the number of haulage and delivery vehicles required during peak periods, weekends and during sporting field operations.
- You must install all signposting, bollards and barriers wherever necessary to cater for pedestrians.
- The number of traffic lanes and traffic capacity of all other roads existing at the Site at the Date of Contract must be maintained, except as provided elsewhere under this clause.
- All current turning movements into and out of local roads must be maintained during construction except approved by the SOPA and relevant Council.
- You must comply with the requirements of the Roads Act 1993 and obtain written approval from the local council and Sydney Olympic Park Authority for all works affecting traffic (both vehicular and pedestrian) on local roads including any proposed lane closures or prevention of turning movements. Any closure, prevention of turning movements or lane closures on local roads are to be minimized as much as possible.
- Consult with all emergency services and local bus companies to provide an update of changed traffic conditions that will affect the road network, speed zones, construction access or property access locations.

7.2 ROAD USER AND WORKER SAFETY

Regular audit/inspection will be conducted for the Pedestrian Management Plan and each TCP revision submitted to the SOPA. These audits will address both road user and worker safety key issues including but not limited to the following;

- Interaction and separation of cyclist traffic with vehicular traffic
- Interaction and separation of public traffic with construction traffic
- Proper use and installation of Temporary Road Safety Barrier systems including end terminals and deflection zones (if required)
- Adequate protection of excavations and roadside hazards
- Proper use and placement of signage, particularly with reference to speed zoning and warning signs
- Sufficient roadway lighting to meet or exceed existing condition at conflict points
- Proper line marking removal techniques to ensure ghost lines are not present, particularly in adverse weather conditions
- Sufficient delineation of worksites, no go zones, between line marking operations and to guide all road users through or around work area
- All changed road conditions such as alignment and configuration to be appropriately signed, line marked and delineated to guide all road users through or around work area as well as meet horizontal curve and vertical grade design requirements
- Sufficient visibility and sight distance in particular at horizontal curves and vertical grades and for cyclists
- Suitable drainage to ensure minimum flow widths and flow depths are encountered so not to hinder road users and their travelled path, particularly in adverse weather conditions
- Appropriate provisions are provided for all types of vehicular, pedestrian and cyclist traffic, particularly heavy vehicle sweep paths.

7.3 ROAD OCCUPANCY LICENCE/HOARDING/BARRICADE PERMIT

ROAD OCCUPANCY

For Holker Busway and the P5 Loop Road - The process to obtain Road Occupancy Licence (ROL) for the project from the Sydney Olympic Park Authority for any activity that may impact on the operation of the road network:

- When your planned activity requires an existing road to be used in such a way that affects traffic or pedestrian flow, obtain a Road Occupancy Licence (ROL) from the Sydney Olympic Park Authority.
- Submit your application for an ROL at least 15 working days prior to the planned commencement of the activity requiring the road occupancy.
- The activity must not commence until the ROL has been obtained.

For Hill Road the process to obtain Road Occupancy Licence (ROL) for the project as noted under section 138 of the Road Act 1993 for any activity that may impact on the operation of the road network:

- When your planned activity requires an existing road to be used in such a way that affects traffic flow, obtain a Road Occupancy Licence (ROL) through Transport's Online Planned Incident System (OPLINC).
- Submit your application for an ROL to the relevant responsible body stated in the Road Occupancy Manual at least 10 working days prior to the planned commencement of the activity requiring the road occupancy. The activity must not commence until the ROL has been obtained.
- Where TMC is the responsible body for issuing the ROL, allow an additional 20 working days for TMC to first assess your Traffic Management Plan if required.

- Obtain concurrence of the Sydney Olympic Park Authority

HOARDING

Under section 138 of the Road Act 1993 a separate application must be made to the relevant road authority to erect a hording and/or scaffolding in a public road (if applicable) and such application is to include:

- Architectural construction and structural details of the design as well as proposed artwork;

  and

- Structural certification prepared and signed by appropriately qualified practising structural engineer.

Evidence of the issue of a Structural Works Inspection Certificate and structural certification will be required prior to the commencement of construction works on site.

The Sydney Olympic Park Authority controls the footpath areas for Hill Road, Holker Busway and the P5 Loop Road a separate application must be made to erect a hoarding and/or scaffolding in a public road (if applicable) and such application is to include:

- Architectural construction and structural details of the design as well as proposed artwork; and
- Structural certification prepared and signed by appropriately qualified practising structural engineer. Evidence of the issue of a Structural Works Inspection Certificate and structural certification will be required prior to the commencement of construction works on site.

- Proposed Artwork for the hoarding, including wording, graphics.

BARRICADE PERMIT

Where construction works require the use of public place including a road or footpath, approval under section 138 of the Road Act 1993 for a Barricade Permit is to be obtained prior to commencement of work. Details of barricade construction, area of enclosure and period of work are required to be submitted to satisfaction of the relevant road authority.

Where construction works require the use of public place including a road or footpath, approval under section 138 of the Road Act 1993 for a Barricade Permit is to be obtained prior to commencement of work. Details of barricade construction, area of enclosure and period of work are required to be submitted to the Sydney Olympic Park Authority 15 working days prior to occupying the road or footpath. For works occurring on Hill Road to contact both Council and the Sydney Olympic Park Authority.

8 STAGING AND TIMING OF WORKS

This section describes the construction staging of the URBNSURF (Developments) Sydney has not been defined at this stage.

9 MONITORING OF TRAFFIC CONTROL MEASURES

All traffic control measures and signs shall be checked at the commencement and conclusion of each days works to ensure they are in place as shown on the TCP for each stage. Corrective measures shall be implemented as soon as practicable to resolve any issues that may be identified.

Records of the results of inspection check shall be kept and a monthly summary shall be prepared and submitted to the Principal on request.

The person conducting the check shall be qualified in the RMS "Design and Inspect Traffic Control plans" or "Prepare a Work Zone Traffic Management Plan" course (ie. Hold a current Orange Card).

10 ROUTINE MAINTENANCE OF ROADWAYS

Within the boundaries of the Limit of Works, Ertech shall:

- regularly monitor the condition of any existing trafficked pavement and/or pavement constructed for staging and identify any defect or hazard.
- regularly monitor the condition of any footpaths or walkways and identify any hazard to pedestrians.
- regularly monitor the condition of the corridor and identify vegetation that requires maintenance, and any debris, litter, graffiti and posters to be controlled.
- regularly monitor the condition of any pavement marking or signs and identify any defects or repairs.

In the event that any such defect, required repair or hazard is identified, it shall be rectified as soon as practicable.

10.1 EXISTING ROADWAYS

Maintenance of existing roads outside the Site will be undertaken by others. Ertech shall cooperate with TfNSW, Sydney Olympic Park Authority or their agents in carrying out their maintenance responsibilities.

Ertech is responsible for repair of roads (including roads outside the Site) if these are damaged as a result of any activity associated with the works. These repairs shall be carried out on an on-going basis as soon as practicable after being so directed by the Principal.

A pre-construction survey shall be undertaken, prior to the commencement of any construction activity, of all roads that connect to the project area up to a reasonable distance past the Limit of Works.

The pre-construction survey reports shall provide a series of reference points to permit detection of any damage that may be caused by construction activities. The reports will include:

- Photographs
- Sketches
- Narrative descriptions of existing condition of facilities (including but not limited to road furniture, drainage, existing utilities and pavement condition etc.)

A copy of the survey report shall be provided to the Principal and any other relevant stakeholder as required.

10.2 TEMPORARY ROADWAYS AND DETOURS

Routine maintenance shall be carried out on any temporary roadways and detours in use during construction, including former road shoulder areas that have been upgraded to temporary roadway pavements.

Any local roads used by construction traffic shall be maintained and linemarking shall be reapplied as needed to clearly delineate traffic lanes for the duration of the temporary traffic arrangements.

Temporary roadway and detour design would be conducted by engaging a TfNSW qualified road designer, the design of the wearing surface of the temporary roadways and detours will have the required characteristics in terms of skid resistance, evenness and being firm under all weather conditions while remaining structurally sound. The wearing surface would be connected to adjacent roadways on a flush finish status.

11 TRAFFIC INCIDENTS ON WORKSITES DURING CONSTRUCTION

11.1 GENERAL

In the event of a traffic incident occurring within the Limits of Works, or at other locations affected by the work, the Principal shall be notified immediately, and all knowledge of the facts recorded. Photographs shall be taken of the road approaches at 10m intervals starting from at least 200m each side of the incident site, including photographing the location of all relevant safety devices and signs (whether in the above 200m limit or not), and as soon as possible after the incident. A report containing this information shall be provided to the Principal within two days of the occurrence of the incident.

11.2 PROVISION FOR TRAFFIC INCIDENTS

Personnel and equipment shall be made available for after-hours maintenance/emergency callouts seven days per week while construction is in progress.

Following any traffic accidents, any damage to safety barriers, signs or the like shall be rectified to make the roadway safe.

Traffic control devices shall be removed or repositioned promptly and/or debris removed that interferes with traffic flow (under direction of the Transport Traffic Commander, Police or the Principal). In the event that traffic incidents occur in sections of the roadway that are under construction, Ertech shall also:

- Nominate a specific site contact person to deal with issues related to clearing when notified by the Transport Traffic Commander or Police;
- Provide capacity on site for basic early traffic control that may be required at an incident, such as cones, signs, clearing debris;
- Keep suitable plant available on site during construction for moving temporary concrete safety barriers;
- Hold spare safety barriers/ signs or the like on site to allow quick replacement in case of a traffic accident which damages the safety barriers/ signs or the like;
- Contact Transport Management Centre's Operation Room and the Sydney Olympic Park Authority immediately if a traffic incident occurs during working hours;
- Respond within 1 hour to after-hours callouts from the Traffic Management Centre, Sydney Olympic Park Authority or Police; and
- Keep records of communications with the Transport Management Centre, Sydney Olympic Park Authority and Police as well as of all traffic accidents attended.
- Keep records of all traffic incidents attended and provide a detailed report to the Principal.

11.3 EMERGENCY AND RESPONSE TO INCIDENTS

Ertech provide traffic control by qualified traffic controllers for emergencies such as crashes and spillages along the work corridor. Traffic management for these events will not require a hold point release to be submitted to TfNSW.

Despite any other provision of the Project Deed, where the New South Wales Police Force, Emergency Services, TfNSW and TMC are controlling an incident, the Project team:

- Shall comply with any instruction or direction by the New South Wales Police Force, Emergency Services, TfNSW, Sydney Olympic Park Authority and TMC in relation to any proposed closure to a lane or-shoulder

- Shall not restrict, close, interfere with or obstruct the free flow of traffic on any lane or shoulder of the existing Highway, the works or a Local Road contrary to the instructions of the New South Wales Police Force, Emergency Services, TfNSW, Sydney Olympic Park Authority and the TMC
- If permitted to restrict, close, interfere with or obstruct the free flow of traffic on any lane or shoulder of the works or a Local Road, shall act in accordance with any instructions of the New South Wales Police Force, Emergency Services, TfNSW, Sydney Olympic Park Authority and TMC including to suspend any of the contractor's work and to reopen the lane or shoulder. Except to the extent that compliance with any instructions of the New South Wales Police Force, Emergency Services, TfNSW, Sydney Olympic Park Authority and TMC makes it impossible to do otherwise, this clause shall not relieve the Project team from its obligations under this Project Deed.

The types of emergencies/unplanned incidents that may occur include, but are not limited to:

- Motor vehicle crashes
- Bush fires
- Environmental spills
- Terrorist attacks
- Bomb threats
- Construction type incidents
- Structural catastrophic failures
- Inclement weather conditions
- Flooding
- Anti-social behaviour.

The inevitable nature of emergencies and their potentially significant social, economic and environmental consequences is acknowledged, and relevant state acts and legislation have been enacted to controlling these situations.

The relevant acts identify agencies primarily responsible for controlling particular hazards/emergencies. Such agencies are detailed in the Table below.

Event	Agency
Law Enforcement / Emergencies	Police
Fire	Fire Brigades / (e.g.) Rural Fire Service
Hazardous Materials	Fire Brigades
Flood	State Emergency Service
Storm and Tempest	State Emergency Service

The project team will adopt the operating procedures for managing emergencies and unplanned incidents that are addressed in the WHS Management Plan.

In the event of a traffic accident occurring within the construction site or at other locations affected by the works, the Project team will record the knowledge of the facts and photograph the approach to the accident site including the location of all safety devices and signs as soon as possible after the accident. A report with this information must be forwarded to TfNSW within 2 days of the occurrence of the accident.

In addition, the Project team will use an appropriate standard plan from TCWS, adjusting it as needed to suit the site conditions.

11.4 EMERGENCY SERVICES

The Community Relations Manager and the WHS Manager will be responsible for providing up to date information to the respective emergency services regarding any changes or restrictions to traffic flows during the project. The wider project team will be responsible for adhering to these requirements and notifying the Community Relations Manager and Safety Manager of any restrictions or changes as required.

Arrangements to manage impacts on emergency services include:

- Notification and communication with affected emergency services
- Updating the project team and work crews of any requirements or measures to be undertaken to enable access through site in conjunction with emergency services
- Notification of out of hours works or works that may restrict access including suggested detour routes
- Provision for emergency service access through construction zones and subsequent notification to emergency services of any changes to these conditions
- Communication with the project workforce to ensure understanding of emergency access and response requirements
- Training of staff to ensure understanding of expectation and requirements.

11.5 EMERGENCIES IN CLOSE PROXIMITY TO THE PROJECT

The Traffic Manager will be required to notify relevant key stakeholders including traffic/incident controllers such as NSW Police, TMC, and Local Council for traffic incidents that occur in close proximity to but not within the Project Boundary. For example, if a major crash occurred just outside the Project Boundary and was due to issues un-related to the construction site, the construction personnel may be the first “eyes and ears” to detect the incident. This notification is required to be done immediately in order to mitigate traffic delays caused by these incidents.

The Traffic Manager or the delegates will then be required to contact the relevant incident controller.

12 CONSTRUCTION VEHICLES AND HAULAGE

12.1 TYPES OF CONSTRUCTION VEHICLES

Various types and frequency of construction vehicles will be required throughout the construction of the project, notably;

- Piling Rig float
- Misc. Plant floats
- Concrete trucks
- Haulage trucks
- Light vehicles.

12.2 SITE ACCESS AND EGRESS

Specific construction site access and egress locations will be detailed in the VMP design report and drawings. The primary construction vehicles would be via the existing main site access from the south via loop road off Hill Road. A limited number of vehicles would also need to access the north-eastern part of the site via intersection of Hill Road and Holker Busway in a manner which does not endanger or restrict other road users, all the construction vehicles accessing site via the Holker Busway must have valid access permit issued by SOPA.

The worst-case construction traffic would occur in the first 3 months during Bulk Eathworks and Ground Improvement works with up to 20 heavy vehicles (10 in 10 out) and 5 light vehicles per hour accessing the site.

Ertech will ensure to have proper entry and exit gates installed while being designed for highest posted speed arrangements when gates are in operation.

For large vehicle types which movements are inhibited by site specific constraints such as geometry and road infrastructure then these vehicles will be controlled under TCP implementations. Swept path analysis has been conducted on gate entrances which shows restricted movements. Where required Traffic control will be utilised for entry and exit to site.

12.3 MAINTENANCE OF ENVIRONMENTAL CONDITIONS

To minimise and mitigate against any debris forming on the existing road networks control measures including but not limited to the following will be carried out:

- Management and restriction of construction vehicles where wet weather conditions affect the site
- Engagement of street sweepers under mobile work TCPs.

Regular inspections will be conducted on existing road during construction to identify if maintenance is required to ensure safe passage of vehicles. Routine maintenance of roadways including repairing potholes, cleaning kerbs, clearing blockages of stormwater drains, reinstating pavement markings and removing debris from roadway will be completed without delay.

13 ROAD USER MANAGEMENT

13.1 VEHICULAR TRAFFIC

Changes to the vehicular traffic provisions and movements will be required as part of the TCP and VMP design and implementation. For TCP and VMP implementations all vehicular traffic provisions and movements will be in accordance with AS1742.3 and TCWS Manual to minimise disruption the vehicular traffic. Upon completion of the project any temporary provisions, such as pavement widening's and linemarking, will be removed and original condition or permanent design reinstated. Traffic can only be switched to a temporary roadway or detour where the usual workforce is on site for a minimum two days thereafter. This is to ensure the safe passage of road users on the new alignment and any modifications identified can be resolved immediately.

If temporary roadways are required, these will be designed in accordance with the following relevant design standards:

- Undertaken by an TfNSW approved Road Designer with at least 5 years of experience
- Road geometry designed in accordance to Austroads Guide to Road Design and associated TfNSW supplements

- Drainage system designed in accordance with Austroads Guide to Road Design Part 5: Drainage and TfNSW Supplement for a storm of intensity less than a 1 in 5 year occurrence
- Pavement designed in accordance with approved design

13.2 PROVISION TO MAINTAIN COMMERCIAL AND RESIDENTIAL ACCESS

Where impacts to commercial and residential accesses are identified the Community Relations Manager (CRM) will liaise directly with affected owners to ensure property accesses are always maintained or agreed alternative arrangements are implemented. Initial liaison and the ongoing updates of the impacts will be carried out as per project's Communication Plan.

All TCP and VMP drawings will be designed to maintain the existing provision to all commercial and residential accesses.

13.3 PUBLIC TRANSPORT PROVISIONS

A plan detailing work to be undertaken and describing its impacts on the general area, especially its impact on public transport and passengers, cyclists, pedestrians, motorists and commercial operations. It also describes how these impacts are being addressed. May also contain detailed TCPs and VMPs.

For all existing public transport provisions, particularly the bus services, where there are impacts identified the Community Relations Manager (CRM) will liaise directly with relevant authorities to ensure existing services are maintained at all times or agreed alternative arrangements are implemented. Initial liaison and the ongoing updates of the impacts will be carried out as per project's Communication Plan.

13.4 PEDESTRIANS AND CYCLISTS

The existing cycling and pedestrian networks with pedestrian footpaths provided on both sides of Holker busway and Hill Road providing good pedestrian access to the SOP Train Station to the south and the SOP Ferry Wharf to the north-west will be maintained at all time. If any changes to the pedestrian provisions and movements may be required as part of the TCP and VMP design and implementation. For TCP and VMP implementations all pedestrian provisions and movements will be in accordance with TCWS Manual, AS1742.3. Upon completion of the project any temporary pedestrian provision will be removed, and original condition or permanent design reinstated.

Changes to the cyclist provision and movements will be required as part of the TCP and VMP design and implementation. For TCP and VMP implementations all cyclist provision and movements will be in accordance with TCWS Manual and AS1742.3. Upon completion of the project any temporary cyclist provision will be removed, and original condition or permanent design reinstated.

The TCP and VMPs which will impact on existing pedestrian and cyclist provisions will detail the following:

- Existing route and condition
- New route and condition including pavement surfacing, path width, signage and lighting (if required).

For all pedestrian and cyclist provisions where there are impacts identified will liaise directly with relevant stakeholders and authorities to ensure existing provisions are maintained at all times or agreed alternative arrangements are implemented. Initial liaison and the ongoing updates of the impacts will be carried out as per project's Communication Plan.

13.5 EMERGENCY SERVICES

No emergency service facilities/ depots have been identified within project extents. Any traffic operation which is likely to restrict emergency service access through the worksite such as road closures, detours and contraflows then the CRM will notify the local emergency services at least 48hrs in advance.

Traffic controllers, when onsite, will facilitate the passage of emergency services through the worksite with minimal delay.

13.6 OVERSIZED AND/OR OVERMASS VEHICLES (OSOM)

Oversize and/or Over mass vehicle and loads (OSOM) are defined as Class 1 vehicles under the Heavy Vehicle National Law. There may be necessity for either a vehicle exceeding allowable length or overhang to enter site, in which case the necessary permits and notification to relevant authorities will be issued. Appropriate TCP will be submitted and approved, and traffic controllers will facilitate the safe entrance/egress to and from site.

If an unexpected excessive dimension transport arrives at the site when construction works are underway then, where possible, the projects on site supervision will cater for the safe and expedient travel through the works site. If transport is unable to be guided through worksite then NSW police will be contacted to assist in further operations.

13.7 TRUCK MOVEMENTS

The major truck movements expected first 3 months during the Bulk Excavation and Ground Improvement works. During earthworks and ground improvement with up to 20 heavy vehicles (10 in 10 out) and 5 light vehicles per hour accessing the site.

All construction vehicles accessing the site via Holker Busway must have a valid access permit issued by SOPA.

All loading and unloading associated with construction must only be accommodated on site.

The public way must not be obstructed by any materials, vehicles, refuse ships or the like under any circumstances.

All vehicles involved in the excavation and/ or demolition process and departing from the property with materials, spoils or loose matter must have their loads fully covered before entering the public roadways.

Suitable measures are to be implemented to ensure that sediment and other materials are not tracked onto roadway by vehicles leaving site.

13.8 PROPOSED HOURS

The proposed hours of work are 7am to 5pm Monday to Saturday, No work on Sunday and public holidays Works may be undertaken outside these hours where:

1) Delivery of materials is required outside these hours by the police or either authorities or

2) It is required in an emergency to avoid the loss of life, damage to the property and/or to prevent environmental harm.

SOAP shall be advised in advance of any access for construction delivery vehicles during major events periods.

13.9 SITE PARKING

Designated reverse site parking will be installed to cater for site workers. The parking areas will be differentiated with blue flagging and signage. Parking areas will be altered as required to allow for changes in parking demand and as required for the staging of construction works. All site parking to be reverse parking and parking on the street is to be avoided.

The current parking areas are shown in Appendix F.

14 TRAFFIC COMMUNICATIONS

14.1.1 COMMUNITY AND STAKEHOLDER ENGAGEMENT

All traffic community and stakeholder engagement is detailed in the Communication Plan and will be carried out by the CRM and TCSM in consultation. Community and stakeholder engagement will be carried out for high level vehicular traffic impacts and all pedestrian and cyclist impacts to be informed of the physical changes, expected delays, traffic impacts, alternative routes and alternate transport modes if required.

14.1.2 COMMUNITY CONSUTATION AND COMPLAINTS

Any Traffic impacts will be communicated in advance as per the communications plan. Engagement with the SOPA's Precinct Operational Unit seven days prior to event taking place and must appropriately reference plans include the dimension of any proposed blockage areas and temporary structures and include supporting details.

14.2 NOISE MITIGATION

All works will be conducted within the approved hours of work. It is not expected that noise will be conducted outside normal construction noise limits. To mitigate the risk of noise outside the acceptable limits all plant and equipment will be inspected as per Ertech's onboarding procedures prior to commencing works on site.

14.3 PROJECT MEETINGS

Project specific traffic meetings are not envisioned to be required for this project with all traffic related discussions to be tabled at the monthly project meetings. If throughout the project specific traffic meetings are required then the Project Manager and TCSM will endeavour to make themselves available to attend.

14.4 NON-CONFORMANCE REPORTING

All traffic non-conformances will be identified and responded to as per QMP non-conformance process.

APPENDIX A - TRAFFIC MANAGEMENT POLICY

ERTECH HOLDINGS

TRAFFIC MANAGEMENT

POLICY

WE ARE COMMITTED TO PROVIDING A SAFE WORK ENVIRONMENT. TRAFFIC MANAGEMENT IS NECESSARY TO SAFELY GUIDE VEHICULAR TRAFFIC THROUGH THE WORKSITE IN A SAFE AND EFFICIENT MANNER.

To meet this commitment we will:

- Be fully aware of and will comply with each states' Health and Safety Acts, Regulations and road authorities Codes of Practice;
- Undertake Traffic Management in a professional manner in accordance with the principles of AS 1742.3;
- Ensure that when necessary any employee who is directly in charge of operations on site will, as a minimum, hold a Basic Worksite Traffic Management Certificate and that persons controlling traffic will be accredited Traffic Controllers;
- Take all adequate precautions to prevent accident or injury to persons;
- Ensure that staff receive and hold the relevant training and accreditation in roadworks Traffic Management;
- Ensure that adequate precautions are taken to enable road users to safely negotiate worksites with minimal disruption;
- Monitor and conduct regular site inspections to ensure compliance with and determine effectiveness of Traffic Management Plans;
- Review policies and procedures in order to promote continual improvement;
- Consult and communicate with employees and subcontractors on the implementation of Worksite Traffic Management; and
- Meet all relevant legislation and other legal and contractual requirements.

James Giumelli
Managing Director

Gavin Miller
Executive Chairman

H-PRJ-POL-038

REV DATE: DECEMBER 2017

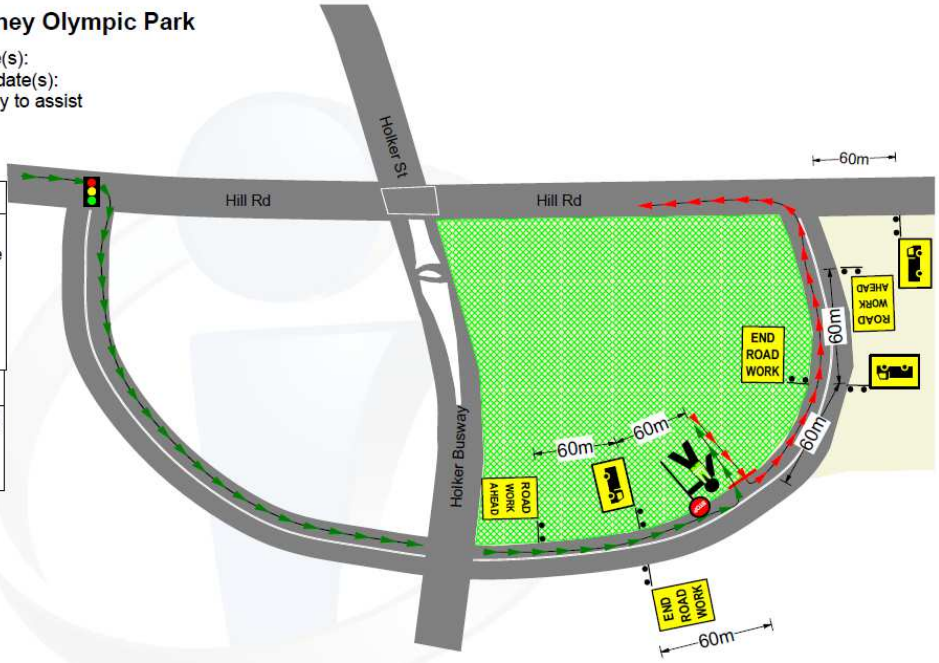
APPENDIX B – TRAFFIC CONTROL PLANS

TCP0324.GF - Hill Rd Sydney Olympic Park

Long Term Signage installation date(s):
Long Term Signage De-installation date(s):
TC to hold construction vehicles only to assist with safe site egress.

Legend
Access
Construction Vehicle Entry Route
Construction Vehicle Exit Route
sign single
Site Access Gate
Traffic Controller Stop/Slow

Manifest
2 x T1-31 ROAD WORK AHEAD
2 x T2-17 END ROAD WORK
3 x T2-25 TRUCKS



iGroup SERVICES

Date: 28/06/2021 **Author:** Grant Fayle **Project:** Construction Site Vehicle Access.
TCP: TCP0324.GF **Location:** Hill Rd Sydney Olympic Park NSW 2127 **Ver:** 01.2021
RMS PWZ/TMP: 0052143997 **Drawn:** AS1742.3 2009, TCAWS v5.0

Comments:
Long Term Works - Construction Site Vehicle Access
Consulted: iGroup, C Clifford, Y Yoganathan
Advance Warning Spacing = ("D") 90km/90m-100m, 80km/80m, 70km/70m. 60km/45m-60m, 50km/15m-50m, 40km/0m-15m
All signs subject to +25% -10% tolerance
Not Drawn To Scale

Appendix C2 (k) Noise and Vibration Management Plan

Transport
Roads & Maritime
Services

NSW GOVERNMENT

Construction Noise and Vibration Guideline

August 2016

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Acknowledgements

Roads and Maritime Services would like to acknowledge Transport for New South Wales and the Construction Noise Strategy in the development of the Construction Noise and Vibration Guideline. Roads and Maritime's Guideline has updated, for use on road projects, parts of the TfNSW Strategy in Appendix B, C and F of this guideline.

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About this release

1 Overview

1.1 Why is this guideline required?

This guideline outlines the approach Roads and Maritime Service takes to the assessing and mitigating construction noise. For the purposes of this guideline construction noise and vibration also includes noise and vibration from minor works maintenance activities. It supersedes Section 5 and Practice Note (vii) of the Environmental Noise Management Manual (2001).

This policy should be read in conjunction with the following documents:

- EPA Interim Construction Noise Guidelines
- EPA Assessing Vibration – Technical Guideline
- EPA Road Noise Policy
- RMS Project Pack
- RMS REF Procedure
- RMS Procedure for Routine and Minor Works
- RMS Noise Criteria Guideline
- RMS Noise Mitigation Guideline

1.2 Policy statement

Roads and Maritime is committed to effectively managing impacts from its activities in an environmentally responsible manner. Roads and Maritime is committed to avoiding or minimising noise and vibration impacts from construction noise on projects under our control.

Roads and Maritime recognises that considering noise at the outset of a project can minimise or avoid noise impacts and the cost of mitigating them.

Roads and Maritime will assess and provide feasible and reasonable noise mitigation measures for:

- Maintenance works
- Construction
- Construction traffic including diversions
- Ancillary sites

Roads and Maritime prefers noise and vibration mitigation measures to be applied within the road corridor or site boundary wherever practicable. Measures that need to be applied outside the road corridor or site boundary such as at property treatment of building facades will be limited to the circumstances described in this guideline.

1.3 Context

The NSW Interim Construction Noise Guideline calls for the application of feasible and reasonable measures to mitigate construction noise and vibration.

This guideline provides the detail needed to identify feasible and reasonable noise mitigation measures for construction, minor works and maintenance projects.

This guideline will need to be considered for all construction, minor works and maintenance projects.

Construction noise impacts and mitigation measures need to be evaluated at various stages of a project to inform the concept design, environmental impact assessment, detail design and construction process.

When identifying feasible and reasonable noise mitigation the noise level from construction sites is considered in isolation from road traffic or operational noise. This is because construction noise is different in character operational noise. This is reflected by EPA's construction criteria which relate mostly to how noisy construction is relative to background noise levels.

Construction vehicle traffic and traffic diversions are assessed and mitigated using standard road traffic noise processes.

1.4 Construction hours

Construction activities (including the delivery of plant and equipment) should be limited to within the hours described in Table 1 below wherever feasible and reasonable. This helps reduce noise and vibration impacts by limiting potentially noisy and vibration causing construction activities to the day time, when background noise levels are higher, and by providing respite from construction noise and vibration during the evening, overnight and on weekends.

Table 1: Construction hours

Construction hours	Monday to Friday	Saturday	Sunday / Public holiday
Standard construction hours	7:00 am to 6:00 pm	8:00 am to 1:00 pm	No work
Construction activities with impulsive or tonal noise emissions	8:00 am to 5:00 pm[1]	9:00 am to 1:00 pm[1]	No work
Blasting	9:00 am to 5:00 pm	9:00 am to 1:00 pm	No blasting

Notes: 1. Works may be carried out in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. 'Continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.

1.5 Scope

This guideline provides a consistent approach to the evaluation, selection and design of the most appropriate noise and vibration control options during maintenance and construction. This guideline is most relevant for:

- Project managers
- Environmental staff
- Project implementation managers
- Acoustical consultants.

This guideline will apply for:

- All projects managed by Roads and Maritime:
  - In the final stages of project concept design development and in the environmental impact assessment (including any REF).
  - During the project's detailed design.
  - During the actual process of construction
- Minor works
- Maintenance
- Ancillary sites
- Construction traffic and diversions.

The guideline does not apply to:

- Emergency works.

2 Definitions

Term	Definition
Affected Distance	Distance up to which noise levels are expected to exceed the Noise Management Level as defined by the EPA's ICNG.
At-receiver treatments	Includes building treatments and courtyard walls. Building treatments may include but are not limited to ventilation, glazing, window and door seals, sealing of vents and underfloor areas.
Equitable	Receivers and communities exposed to road project noise receive consistent outcomes.
Feasibility	Relates to engineering considerations (what can be practically built). These engineering considerations may include: • The inherent limitations of different techniques to reduce noise emissions from road traffic noise sources • Safety issues such as restrictions on road vision • Road corridor site constraints such as space limitations • Floodway and stormwater flow obstruction • Access requirements • Maintenance requirements • The suitability of building conditions for at receiver treatments.
Highly sensitive receiver	Receiver where standard annoyance and human comfort criteria do not provide sufficient guidance on the impact. Some examples include buildings with sensitive equipment, recording studios and cinemas.
Number of affected receivers	The number of receivers that may be considered to be few or many will depend on the project resources and the number of receivers.
-Few receivers	Where the project resources are sufficient to meet with affected receivers then the number of receivers is considered to be few. Note in some instances it may not be possible to meet with all receivers due to circumstances associated with a particular receiver.
-Many receivers	Where the project resources are unable to meet with all affected receivers then the number of receivers is considered to be many. Project resources should be sufficient to meet with the worst affected receivers. Where letter box drops are necessary to communicate with the community then this would be considered to be many receivers.

Term	Definition
Project	For the purposes of this guideline project include maintenance works, minor works and new roads or redeveloped upgrades.
Reasonable	Selecting reasonable measures from those that are feasible involves judging whether the overall noise benefits provide significant social, economic or environmental benefits. The factors to be considered are: • The noise reduction provided and the overall number of people that benefit from the mitigation. • Existing and future noise levels, including changes in noise levels in the build and design year and the extent of any exceedance of the noise criteria. • Potential for a mitigation measure to reduce noise during construction as well as from road traffic after the project is complete. • The cost of mitigation, including the cost of noise mitigation measures as a percentage of the total project cost and the ongoing maintenance and operational costs. • Community views and preferences (typically gathered during the community consultation process following the noise assessment). • Visual impacts for the community surrounding the road project and for road users. These are typically identified in the Environmental Assessment. • The wider community benefits arising from noise mitigation of the proposed road or road redevelopment. • Relative weighting of treatments with respect to protection of outdoor areas or only internal living spaces.
L_{Amax}	The “Maximum Noise Level” for an event, used in the assessment of potential sleep disturbance during night-time periods. The subscript “A” indicates that the noise levels are filtered to match normal human hearing characteristics (i.e. A-weighted). “Fast” time constant is used for this measurement.
$L_{Aeq(15\ minute)}$	The “Energy Average Noise Level” during construction activities, evaluated over a measurement period of 15 minutes. This is the main parameter used to assess the construction noise impacts
L_{A90}	The “Background Noise Level” in the absence of construction activities. This parameter represents the average minimum noise level during the daytime, evening and night-time periods respectively. The $L_{Aeq(15\ minute)}$ construction noise objectives are based on an allowance margin above the L_{A90} background noise levels.

Term	Definition
PPV	“Peak Particle Velocity”, the peak vector vibration velocity used to assess the risk of damage to structures from ground borne vibration. This is generally evaluated at the building footings.
a_{rms}	“Root mean squared weighted acceleration”, a vibration parameter used to assess human response to continuous or intermittent vibration
eVDV	“Estimated Vibration Dose Value”, the overall vibration exposure assessed over the daytime or night-time period to assess human response to intermittent vibration and calculated as described in AS 2670.

3 Principles for managing construction noise and vibration

This guideline describes the principles to be applied when reviewing and assessing construction noise, vibration and construction traffic. It also describes procedures to assist in reviewing noise and vibration mitigation.

The intention in all situations is to meet the following principles. Should circumstances arise where the procedures in this document do not appear to meet the principles below, then the procedures may be varied through consultation with Roads and Maritime noise specialists. Note that the use of the procedures in this guideline does not guarantee that the principles will always be met and in cases where there is doubt then it is the principles rather than the procedures that are paramount.

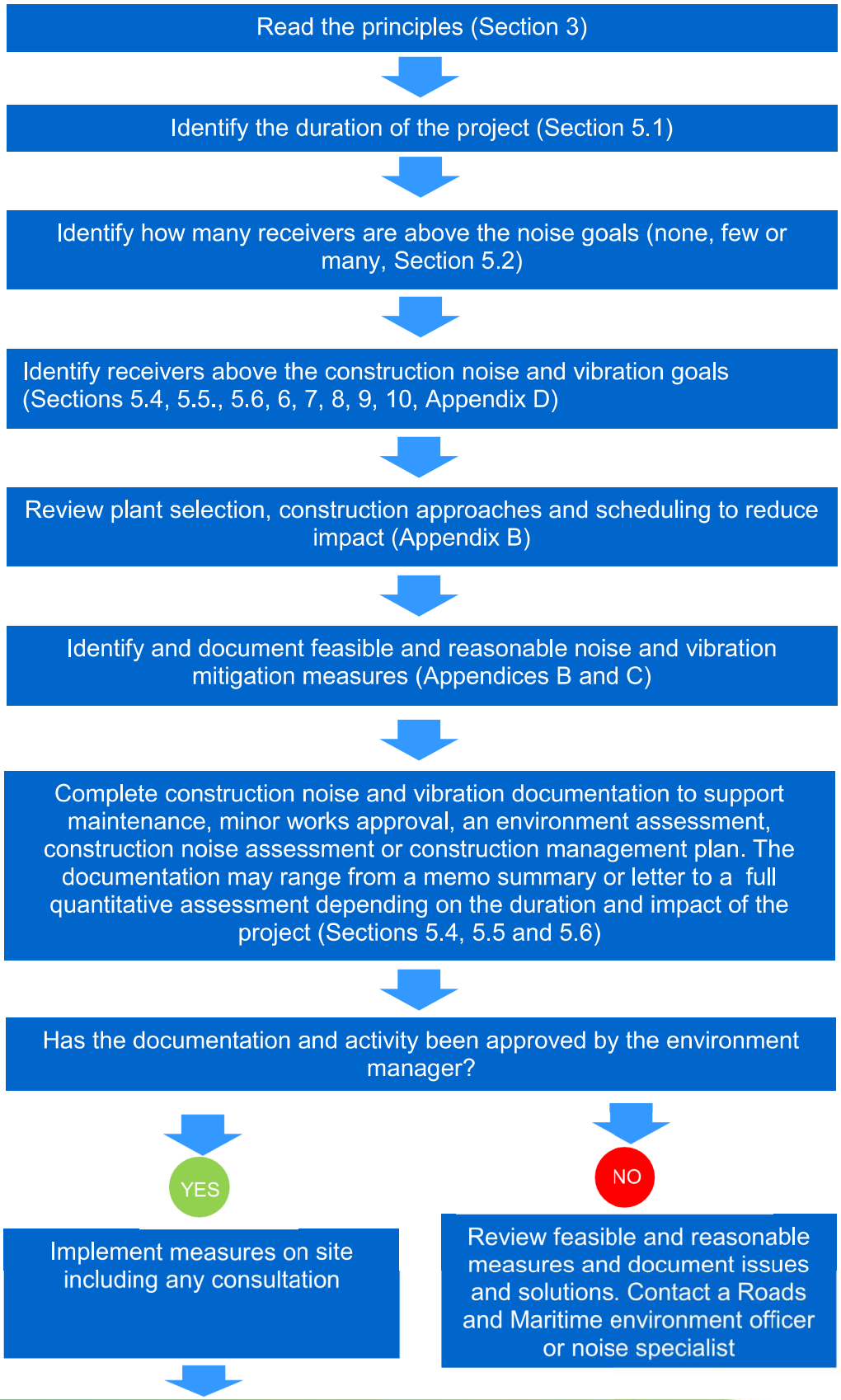
The principles are:

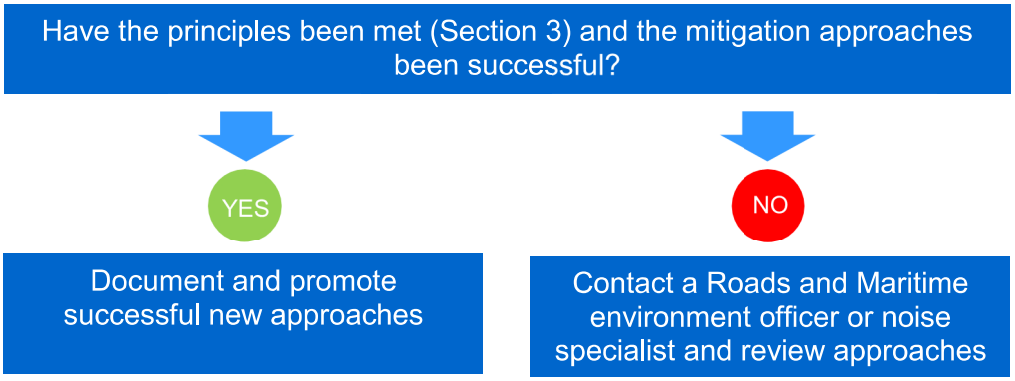
1. Good engagement with the community will be maintained to facilitate effective project delivery with balanced community impacts.
2. Construction noise and vibration levels at sensitive receivers will be minimised where feasible and reasonable.
3. Feasible and reasonable mitigation will reflect the time of day, and the degree and duration of the impact.
4. The community will be informed of the dates for the intended works, sequencing and timing of noisy events. Where possible this will include an indicative schedule over a 24 hour period.
5. Minimising construction noise and vibration will be viewed as a continuous improvement exercise that is inclusive of stakeholders where no idea is too small to be considered.
6. Staff and community will be informed of the effort and methods undertaken to reduce noise and vibration for the works.
7. Any operational noise and vibration improvements resulting from the works will be promoted to the community.

4 How do I use this guideline?

The following flow chart provides an overview of how to use this guideline. Key aspects to note are that the guideline principles must be met and that each step in the flow chart is applicable at each project stage.

Figure 1 Overall approach for management of noise and vibration impacts





The following sections describe in detail the process for construction noise and vibration assessment. Worked examples are given in the accompanying application notes.

5 Identifying the required assessment type

5.1 Project duration and level of impact

Projects including maintenance have the potential to affect the community due to noise and vibration. The overall effect of a project and the likelihood of adverse community reaction depend on both the duration of the works and the level of noise and vibration. This needs to be recognised for each activity without creating an overly onerous process that is out of proportion with the scale of the project, potential impacts or the number of receivers.

The following approach has been developed to reflect the different impact (number of receivers potentially affected) and timelines from inception to delivery of various projects. The aim is to achieve consistent outcomes across all projects while providing an amount of input to noise management that reflects the project timelines and resources.

The approach also recognises that much work is routine and provides for the use of standardised assessments which may be reused for similar tasks in similar situations.

The following key tasks must be completed. Note for ease of implementation the methods and tables in this guideline have been implemented in Roads and Maritime's Construction Noise Estimator (Section 6.1).

- Identify appropriate background noise levels from AS1055, short term measurement or noise logging
- Identify the Noise Management Level. Noise Management Levels are defined by the Interim Construction Noise Guideline goals.
- Identify safe working distances for vibration and blasting.
- Identify the noise and vibration impact and feasible and reasonable mitigation measures. The measures and level of engagement will vary depending on the duration and impact of the project.
- Complete an assessment documenting the noise and vibration impact for the project and measures undertaken to mitigate the impact. For shorter duration or minimal impact projects this will be a brief memo or letter summary ranging to a full quantitative assessment report for longer term projects with greater impact.
- Obtain approval from Environment Manager with appropriate delegation
- Implement community consultation or notification measures.
- Apply and review feasible and reasonable noise mitigation.
- Review measures taken to reduce noise and vibration and promote successful new approaches.

5.2 Identifying the assessment type

The project duration and number of receivers identify the type of construction noise assessment to be carried out for the project. Different assessment types require different amounts of modelling detail and reporting. There are three tiers of approaches based on the number of receivers:

- No receivers with noise levels above the NML (Section 5.3)
- Few receivers above the NML (Section 5.4)
- Many receivers above the NML (Section 5.5)

And three tiers of noise assessment which reflects the project duration:

- Projects less than 3 weeks duration
- Projects 3 to 6 weeks duration;
- Projects greater than 6 weeks duration

The noise assessments with shorter duration and less receivers are quicker to complete and are based on the distance between the project and receivers. The distances are to be used as a guide and are intended to be conservative compared with detailed calculations of noise levels. In all instances detailed calculations or assessments may be completed if this is the preferred approach.

Please see Roads and Maritime's Construction Noise and Vibration Application Notes for examples of implementation.

All steps below requiring the use of lookup tables in Appendices C to E, other than full quantitative approaches with modelling and noise logging, may be instead implemented with Roads and Maritimes Construction Noise Estimator.

5.3 Number of affected receivers

The first task in completing any assessment is to estimate whether the project may affect many receivers, few receivers or no receivers. The following steps may be used for guidance.

1. Use the Construction Noise Estimator to identify an appropriate background noise level and Noise Management Level (NML) for each time period (implemented from Appendix D, table D1). Where needed noise measurement may give guidance on the background level to select in the Estimator.
2. Confirm what equipment is likely to be used for the works and identify and implement standard mitigation measures as described in Appendix B. These standard measures will include scheduling noisy works to occur in standard hours where possible or before 11pm where possible.
3. Using either the individual item or scenario calculation sheets in the Construction Noise Estimator select appropriate items that represent the equipment that will be used during the works. Also include any shielding implemented as part of the standard mitigation measures in Appendix B. The Estimator will then display the Affected Distance where receivers will be impacted to different degrees.
4. Broadly identify the number of receivers within the NML Affected Distance and minimum working distances for vibration from Section 7 and for blasting refer to Section 8.

5.4 No affected receivers

Where there are no receivers within the NML Affected Distance or minimum vibration or blasting distance:

5.4.1 Projects with less than three weeks impact duration

For projects of less than three weeks duration document the background noise levels, noise management levels and the Affected Distance in an internal memo or letter.

5.4.2 Projects with greater than three weeks impact duration

If the project impact duration is greater than three weeks noise calculations should be completed at the worst affected receiver to inform the community.

1. Use RMS' Construction Noise Estimator (6.1) to calculate the noise levels at the worst affected receiver.
2. Document the background noise level and predicted noise level from the works at the worst affected receiver in an internal RMS memo or letter.
3. Notify the worst affected receiver where noise levels from the construction or maintenance are predicted to be greater than 30dBA at their property boundary (or 30m from the receiver on large properties). The purpose of this it to ensure the nearest receiver is aware of the works where there is a chance noise may be noticeable.

5.5 Few affected receivers

Where there are few receivers within the Affected Distance, it may be possible to meet with all receivers to discuss the project and any noise impacts during the works. These meetings could assist in scheduling works to minimise impacts on the community. In instances where the resident cannot be contacted a letter may be hand delivered to their door outlining the works details with contact information should they have any questions. However the emphasis should be on meeting the receivers for the process to qualify as few receivers. Where a bulk postal letterbox drop (or equivalent) is required the number of receivers would be considered to be many.

5.5.1 Projects with less than three weeks impact duration

For projects with less than three weeks impact duration complete a distance based noise assessment to inform the community and establish feasible and reasonable noise mitigation.

1. Use the Construction Noise Estimator to identify an appropriate background noise level and Noise Management Level (NML) for each time period (implemented from Appendix D, table D1). Noise measurement may give guidance on the background level to select in the Estimator.
2. Confirm what equipment is likely to be used for the works and identify and implement standard mitigation measures as described in Appendix B. These standard measures will include scheduling noisy works to occur in standard hours where possible or before 11pm where possible.
3. Using either the individual item or scenario calculation sheets in the Construction Noise Estimator select appropriate items that represent the equipment that will be used during the works. Also include any shielding implemented as part of the standard mitigation measures in Appendix B. The Estimator will then display distances where receivers are impacted to different degrees (implemented from Appendix D, table D2
4. For each distance the Estimator will identify recommended additional feasible ad reasonable mitigation for consideration using Appendix C, table C1.
5. Where the works will generate additional traffic movements then use the Estimator to assess traffic noise (implemented from Appendix C). For example traffic may be generated by spoil movement or temporary reroutes of roads.
6. Where night works are involved use Appendix E to identify sleep disturbance distances.
7. For vibration Section 7 and for blasting refer to Section 8.
8. Obtain approval from Environment Manager with appropriate delegation
9. Identify the team member who is responsible for implementing measures and managing noise and vibration
10. For out of hours works engage with the affected receivers using the additional feasible and reasonable mitigation measures identified from Appendix C for guidance.
11. Implement the measures on site in accordance with the principles.
12. Document the outcomes of these steps.

5.5.2 Projects with greater than three and less than six weeks impact duration

If the project impact duration is between three to six weeks noise calculations should be completed at each receiver and the details of the work documented in more detail.

1. Use Roads and Maritimes Construction Noise Estimator (Section 6.1) to predict noise levels and mitigation measures at all receivers to inform the consultation using the Individual Receiver and Traffic Noise calculation sheets. Include any shielding implemented under the standard measures from Appendix B. Measured background noise levels may be entered into the spreadsheet.
2. The Estimator will identify any additional feasible and reasonable mitigation measures from Appendix C.
3. Where night works are involved use Appendix E to identify sleep disturbance distances.
4. For vibration Section 7 and for blasting refer to Section 8.
5. Prepare a summary report detailing:
    a. Background noise levels
    b. Noise Management Levels
    c. Estimated noise and vibration levels for each time period
    d. Sleep disturbance for night time works
    e. Noise and vibration mitigation measures
    f. Team member responsible for implementing mitigation measures and managing noise and vibration
    g. Obtain approval from Environment Manager with appropriate delegation.
6. Engage with the affected receivers to discuss noise and vibration impacts and implement remaining additional mitigation measures using the additional mitigation measures in Appendix C as guidance.
7. Implement the measures on site in accordance with the principles.

8. Document the outcomes of these steps.

5.5.3 Projects with greater than six weeks impact duration

1. For projects greater than six weeks a detailed noise assessment should be undertaken with at least seven days of noise logging (Further detail is given in Section 6.2). For blasting see Section 8 and for vibration Section 9.
2. Obtain approval from the Environment Manager with appropriate delegation.
3. Engage with the affected receivers on noise and vibration impacts and implement remaining additional mitigation measures using the additional mitigation measures in Appendix C as guidance.
4. Implement the measures on site in accordance with the principles.
5. Document the outcomes of these steps.

5.6 Many affected receivers

Where there are many receivers within the Affected Distance, it may not be possible to meet with all receivers. In this situation bulk letterbox drops (or equivalent) may be required to notify the community. Project resources should be sufficient to meet or engage with the worst affected receivers.

In instances where one of the worst affected residents cannot be contacted an option may be a letter hand delivered to their door outlining the works details with contact information should they have any questions. However the emphasis should be on meeting or engaging the worst affected receivers.

5.6.1 Projects with three weeks or less impact duration

For projects with less than three weeks impact duration complete a distance based noise assessment to inform the community and establish feasible and reasonable noise mitigation.

1. Use the Construction Noise Estimator to identify an appropriate background noise level and Noise Management Level (NML) for each time period (implemented from Appendix D, table D1). Where needed noise measurement may give guidance on the background level to select in the Estimator.
2. Confirm what equipment is likely to be used for the works and identify and implement standard mitigation measures as described in Appendix B. These standard measures will include scheduling noisy works to occur in standard hours where possible or before 11pm where possible.
3. Using either the individual item or scenario calculation sheets in the Construction Noise Estimator select appropriate items that represent the equipment that will be used during the works. Also include any shielding implemented as part of the standard mitigation measures in Appendix B. The Estimator will then display distances where receivers are impacted to different degrees (implemented from Appendix D, table D2).
4. For each distance the Estimator will identify recommended additional feasible and reasonable mitigation for consideration using Appendix C, Table C1.
5. Where the works will generate additional traffic movements then use the Estimator to assess traffic noise (implemented from Appendix C). For example traffic may be generated by spoil movement or temporary reroutes of roads.
6. Where night works are involved use Appendix E to identify sleep disturbance distances.
7. For vibration Section 7 and for blasting refer to Section 8.
8. Document the outcomes of steps 1 to 7.
9. Obtain approval from the Environment Manager with appropriate delegation.
10. For any noise sensitive receiver within each identified distance, implement the corresponding noise mitigation.
11. Meet or engage with the worst affected receivers.
12. Implement the measures on site in accordance with the principles.
13. Document the outcomes of steps 1 to 11.

5.6.2 Projects with impact duration greater than three weeks

For projects greater than three weeks a detailed noise assessment should be undertaken.

1. Complete a detailed assessment, see Section 6.2. For blasting see Section 8 and for vibration Section 9.
2. Obtain approval from Environment Manager with appropriate delegation.
3. Engage with the affected receivers on noise and vibration impacts and implement remaining additional mitigation measures using the additional mitigation measures in Appendix C.
4. Implement the measures on site in accordance with the principles.
5. Document the outcomes of these steps.

6 Quantitative assessment of construction noise

6.1 Construction noise estimator

Roads and Maritime has an Excel spreadsheet titled Construction Noise Estimator. Please see our webpage or contact the noise team for the latest version and training.

The Estimator works in two ways. The first allows the user to enter plant items or activities and the tool outputs distances at which receivers will be impacted. It also allows the user to enter the distances between plant and a receiver, background noise levels and to select whether shielding has been provided. The output also gives a list of additional mitigation measures from Appendix C.

The Estimator also provides estimates of noise from construction traffic.

6.2 Detailed assessment

For higher impact projects with many receivers or longer duration a detailed quantitative assessment should be completed.

As part of the environmental impact assessment process, the impacts on nearby receivers of airborne noise, ground-borne noise and ground-borne vibration generated during the construction of a project are evaluated. This assessment shall form part of the environmental impact assessment documentation (eg. Review of Environmental Factors). The noise and vibration construction assessment should:

- be based on the design, scope and construction methodology for the project
- identify sensitive receivers, the existing noise environment and complete an assessment against relevant criteria for the project. Appendix A lists references with suitable criteria for the assessment of construction noise and vibration.
- Appendices B provides standard measures and Appendix C provides further feasible and reasonable noise and vibration mitigation measures (including any project specific measures[1]) to meet or mitigate any predicted exceedances of the construction noise and vibration objectives at the nearest receivers.

Where the noise and vibration assessment is placed on public display with an environmental assessment, comments received from the community and stakeholders should be considered. Where feasible and reasonable, changes should be made to mitigation and management procedures to accommodate the local community and stakeholders.

Further details on completing quantitative assessments for Roads and Maritime projects are provided in Roads and Maritimes' *Procedure for Preparing an Operational Traffic and Construction Noise and Vibration Assessment Report.*

The construction noise and vibration objectives for the project and any accompanying mitigation measures in the environmental impact assessment documentation are based on an initial design and construction methodology. Typically, as the design of a project is further developed following its approval, the construction methodology and staging is also altered.

Where sufficient detail was not available about the construction activities or timing of works near specific receivers during the environmental assessment an additional Construction Noise and Vibration Impact Assessment (CNIA) may be required for each major construction stage or key activity. This additional detail will be included or referenced in the Construction Noise and Vibration Management Plan (CNVMP). The CNIA should be used as the basis on which to develop or implement the CNVMP[2] for that activity.

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[1] For example: physical structures such as construction noise barriers, acoustic sheds, dwelling treatment, acoustic barriers around noisy plant, operational noise barriers erected early etc or special construction methods such as penetrating cone fracture or controlled blasting in place of conventional rock breaking, etc.

[2] NB: Any changes to the project must be consistent with the environmental assessment documentation and project approval and cannot cause significant additional impacts on the environment or community.

6.3 Noise Catchment Areas

While not a Roads and Maritime or EPA requirement it is common for receivers to be grouped into catchment areas for construction noise during an environmental assessment. A Noise Catchment Area (NCA) can provide a logical grouping of receivers affected by the same works to assist with assessment, consultation or notification.

Noise logging should be completed in a location that is representative of the worst case impact (exceedance of background level by construction noise) to determine the background noise level and criteria. Additional spot check measurements should be completed to understand the range in background noise levels and associated criteria within the catchment which may vary between receiver locations or between alternate facades with different exposure.

The spot checks should be used to provide greater certainty that the mitigation measures designed to manage the impact at the assumed worst case receiver address the noise impact across the catchment. While it may not be possible to accurately identify the background noise level at each receiver, noise levels should be predicted for all receivers within the catchment.

7 Construction vibration

7.1 Ground vibration – Minimum working distances from sensitive receivers

As a guide, minimum working distances from sensitive receivers for typical items of vibration intensive plant are listed in Table 2. The minimum distances are quoted for both "cosmetic" damage (refer BS 7385) and human comfort (refer OH&E's Assessing Vibration - a technical guideline). The minimum working distances for cosmetic damage must be complied with at all times, unless otherwise approved by Roads and Maritime or under the environmental license as relevant. DIN 4150 has criteria of particular reference for heritage structures.

Table 2: Recommended minimum working distances for vibration intensive plant from sensitive receiver

Plant item	Rating / Description	Minimum working distance	
		Cosmetic damage (BS 7385)	Human response (OH&E Vibration guideline)
Vibratory Roller	< 50 kN (Typically 1-2 tonnes)	5 m	15 m to 20 m
	< 100 kN (Typically 2-4 tonnes)	6 m	20 m
	< 200 kN (Typically 4-6 tonnes)	12 m	40 m
	< 300 kN (Typically 7-13 tonnes)	15 m	100 m
	> 300 kN (Typically 13-18 tonnes)	20 m	100 m
	> 300 kN (> 18 tonnes)	25 m	100 m
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	2 m	7 m
Medium Hydraulic Hammer	(900 kg – 12 to 18t excavator)	7 m	23 m
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator)	22 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m
Pile Boring	≤ 800 mm	2 m (nominal)	4 m
Jackhammer	Hand held	1 m (nominal)	2 m

Note: More stringent conditions may apply to heritage or other sensitive structures

The minimum working distances are indicative and will vary depending on the particular item of plant and local geotechnical conditions. They apply to cosmetic damage of typical buildings under typical geotechnical conditions. Vibration monitoring is recommended to confirm the minimum working distances at specific sites.

Operational aspects of some receivers may be highly sensitive to noise and vibration over and above typical noise and vibration allowances based on annoyance and human comfort. For highly sensitive receivers (eg, high technology facilities with sensitive equipment, recording studios and cinemas), specific assessment is required to ensure satisfactory operation of the facility and determine if any mitigation or management measures are required to minimise the potential impacts. Some guidance where building contents contain sensitive equipment may be found in these additional references:

- Australian Standard 2834-1995 Computer Accommodation, Chapter 2.9 Vibration, p16

- Gordon CG Generic Vibration Criteria for Vibration Sensitive Equipment Proceedings of International Society for Optical Engineering (SPIE), Vol. 1619, San Jose, CA, November 4-6, 1991, pp. 71-85
- ASHRAE Applications Handbook (SI) 2003, Chapter 47 Sound and Vibration Control, pp47.39-47.40
- ISO 8569 1996 Measurement & Evaluation of Shock & Vibration Effects on Sensitive Equipment in buildings

In relation to human comfort (response), the minimum working distances in Table 2 relate to continuous vibration. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods are allowed (see OEH's Assessing Vibration: a technical guideline). Where the predicted vibration levels exceed the human comfort objectives, the procedures Appendix C are to be followed in order to mitigate the potential impacts at sensitive receivers.

If the predicted ground-bourne vibration levels exceed the cosmetic damage objectives, a different construction method with lower source vibration levels must be used where feasible and reasonable otherwise construction works should not proceed unless attended vibration measurements are undertaken at the commencement of the works. If there is any risk of exceedance of the cosmetic damage objective, a permanent vibration monitoring system should be installed, to warn plant operators (via flashing light, audible alarm, SMS, etc) when vibration levels are approaching the cosmetic damage objective.

7.2 Ground-borne noise

Underground vibration intensive works may be transmitted through the ground into a building structure creating noise. This may also occur when works are completed in a different floor or occupancy of a building. Ground-borne noise becomes apparent where typical noise paths through the air are blocked.

Estimates should be made for ground borne noise where it may be apparent and noise levels monitored during construction.

Time of day	Ground-borne noise objectives $L_{Aeq(15minute)}$
Daytime 7.00 am to 6.00 pm	Human comfort vibration objectives only
Evening 6.00 pm to 10.00 pm	40 dBA - Internal
Night-time 10.00 pm to 7.00 am	35 dBA - Internal

8 Blasting

For works with blasting complete an assessment of ground vibration and blast over pressure. During the environmental assessment this should include estimates at affected receivers for a given maximum instantaneous charge (MIC). Guidance on vibration and overpressure blasting limits should be based on:

- Australian Standard AS 2187.2-2006, 'Explosives - Storage, transport and use, Part 2: Use of explosives'
- British Standard BS 6472, British Standard BS 7385-2

Prior to works beginning the assessment should be revised with the blasting contractor and trial blasts completed to verify predicted noise and vibration levels.

9 Construction traffic

The EPA's Construction Noise Guideline refers to the NSW Road Noise Policy for the assessment of construction traffic on public roads.

For RMS projects an initial screening test should first be applied by evaluating whether noise levels will increase by more than 2dBA due to construction traffic or a temporary reroute due to a road closure. Where increases are 2dBA or less then no further assessment is required.

Where noise levels increase by more than 2dBA (2.1dBA) further assessment is required using Roads and Maritime's Noise Criteria Guideline. This documents RMS' approach to implementing the Road Noise Policy. Consideration should also be given under the Noise Criteria Guideline as to whether the construction traffic or temporary reroute triggers new road criteria due to changes in road category.

Noise mitigation should be considered using Appendices B and C. Since noise from construction traffic is non-permanent, guidance to feasible and reasonable noise mitigation differs from operational traffic noise.

10 Occupational health and safety considerations

In addition to potential noise and vibration impacts on the community and structures, construction noise and vibration can also have an adverse impact upon the health of workers.

The main adverse impacts of hazardous noise are permanent noise-induced hearing loss and interference with clearly hearing instructions and/or audible warning signals. Excessive vibration from hand-held power tools (such as jack hammers) and whole body vibration (from mobile plant) can lead to adverse impacts such as white-finger disease, damage to tendons and nerves, and lower back pain.

For the above reasons, it is important that contractors adopt noise management strategies to prevent or minimise worker exposure to excessive noise and vibration. Such measures will also assist in reducing noise and vibration impacts on the surrounding community.

The series of Standards, AS/NZS 1269 Parts 0 to 4, sets out procedures to assess, control, manage and review noise hazards, and Regulation 56 of the 'Work Health and Safety Regulations 2011' defines the applicable noise limits that are applicable in NSW.

The National Code of Practice for Prevention of Musculoskeletal Disorders from Performing Manual Tasks at Work (2007) contains guidance on assessing and controlling vibration risks.

11 Approval Delegation

This guideline covers a broad range of construction, minor works and maintenance activities. As such the appropriate delegation level to approve the documentation and activity will vary depending on the type of activity and planning approval pathway.

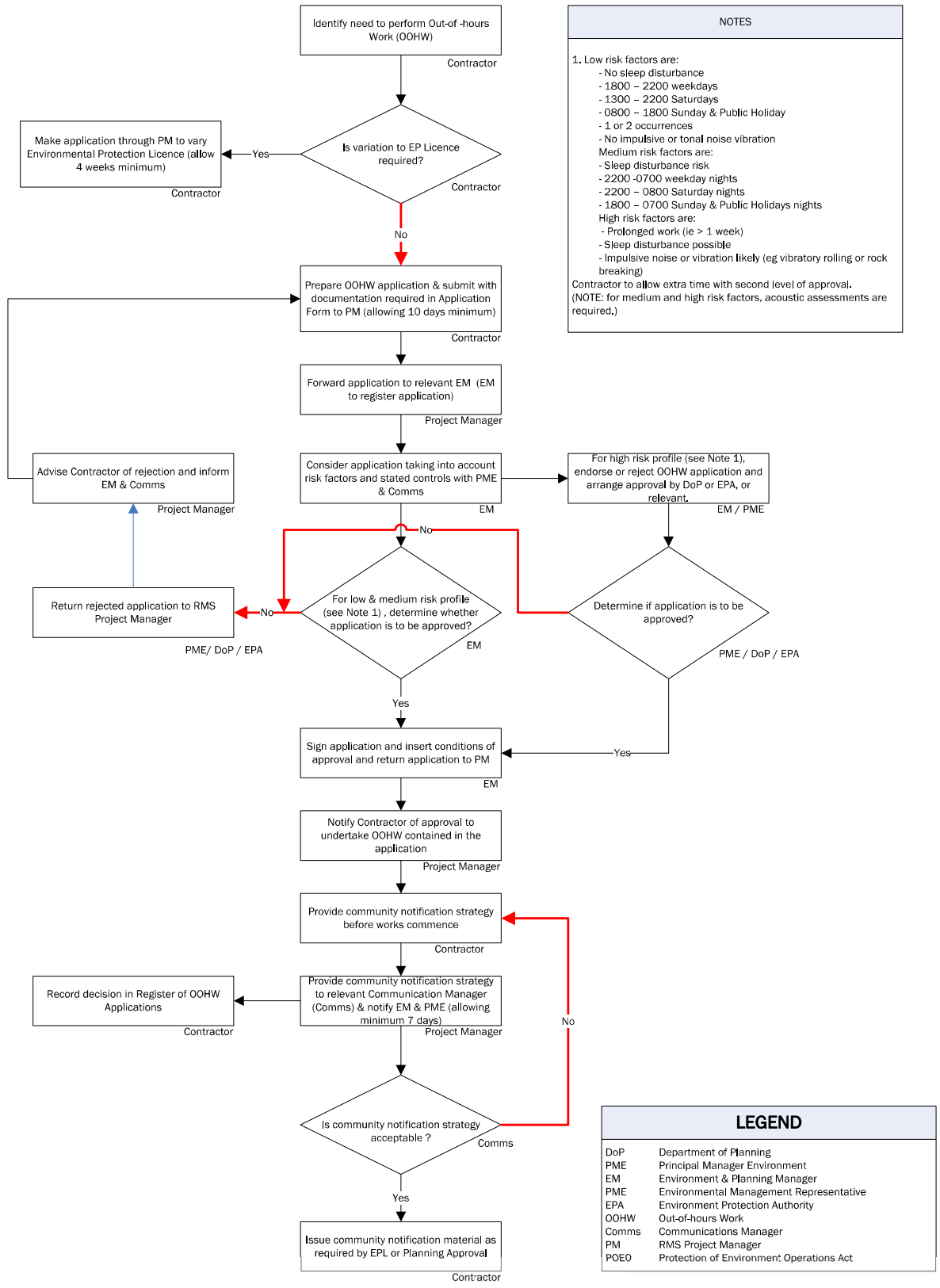
For some projects the appropriate delegation will also depend on project specific Environmental Protection Licences and conditions placed through the Department of Planning.

However the overall process will be similar:

- A proposed work activity will either be already approved or require approval.
- Works that require approval shall be assessed and documented using this guideline and be sent for approval to an Environment Manager and Project Manager. In some instances these may be approved either internally by the contractor or Roads and Maritime subject to project specific contractual arrangements. In other instances external approval may be required by another agency.
- Where works require external approval the Environment Manager and Project Manager shall first review the proposal and provide it for external review to the external agency.

An out-of-hours work assessment and approval procedure is given as an example in Figure 2. Project specific procedures that include specific licence conditions and contractual arrangements may be developed subject to approval by the Roads and Maritime Environment Manager and relevant agencies.

Figure 2 Example Out-of-hours work and assessment procedure (adapted from TfNSW Construction Noise Strategy)



12 Documentation

12.1 Overview

Projects shall maintain a record of all complaints received and the subsequent action taken, in accordance with any determination and licence conditions.

Contractors are to retain records of the following:

- Complaints records (time and nature of complaint)
- Complaints responses and close out actions
- Correspondence
- Monitoring results
- Verification results
- Mitigation measures
- Noise and Vibration Management Plans.

12.2 Documentation and correspondence

12.2.1 General

All written communication should include plain English description of events and impacts aligned with the Roads and Maritime Editorial Guide. Communication templates should be obtained from the Roads and Maritime communication and stakeholder engagement electronic toolkit. Guidance on engagement activities can be sought from the Roads and Maritime Communication and Stakeholder Engagement branch.

12.2.2 Project information line or equivalent

A 24-hour contact telephone number for community enquiries and complaints is required for all construction works. All enquiries require a verbal response within 24 hours during standard construction hours, or on the next working day during out of hours work (unless the enquirer agrees otherwise). All complaints require a verbal response within 2 hours.

12.2.3 Email distribution list

Email distribution lists are used on some projects to disseminate project information to interested stakeholders. Advanced warning of audible activities can assist to reduce the impact of projects experienced by the community.

12.2.4 Signage

Signage is used on projects to notify stakeholders of project details and enquiry contact information. Where possible and when appropriate, the full community notification, detailing likely audible construction noise will be on display at the work site.

13 Appendix A – NSW construction noise and vibration goals and management levels

This appendix provides a brief overview of construction noise and vibration and its potential effects on people, buildings and their contents. It also provides guidance on how to establish construction noise and vibration objectives during the environmental assessment phase.

A.1 Construction noise objectives

Where a quantitative noise assessment is to be undertaken, the construction airborne and ground-borne noise objectives are based on the OEH's Interim Construction Noise Guideline (2009).

The interim guideline contains noise management levels for sensitive land uses including commercial and industrial receivers.

A.2 Effects of vibration on structures

The levels of vibration required to cause cosmetic damage to buildings tend to be at least an order of magnitude (10 times) higher than those at which people may consider the vibration to be intrusive. Guidance may be found in:

- Australian Standard AS 2187: Part 2-2006 Explosives - Storage and Use - Part 2: Use of Explosives
- BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2
- DIN 4150 also has criteria of particular reference for heritage structures

A.3 Human perception of vibration

Guidance in relation to acceptable vibration levels for human comfort are provided in OEH's Assessing Vibration: a technical guideline (February 2006). This document is based on the guidelines contained in BS 6472-1992.

A.4 Effects on building contents

People can perceive floor vibration at levels well below those likely to cause damage to building contents or affect their operation. For most receivers, the controlling vibration criterion is therefore the human comfort criterion and separate objectives are not normally required in relation to the effect of construction vibration on building contents.

Some scientific equipment (eg electron microscopes and microelectronics manufacturing equipment) can require more stringent objectives than those applicable to human comfort. Where appropriate, objectives for the satisfactory operation of critical instruments or manufacturing processes should be sourced from manufacturer's data and/or other published objectives.

A.5 Construction vibration on sensitive equipment

- Australian Standard 2834-1995 Computer Accommodation, Chapter 2.9 Vibration, p16
- Gordon CG Generic Vibration Criteria for Vibration Sensitive Equipment Proceedings of International Society for Optical Engineering (SPIE), Vol. 1619, San Jose, CA, November 4-6, 1991, pp. 71-85
- ASHRAE Applications Handbook (SI) 2003, Chapter 47 Sound and Vibration Control, pp47.39-47.40
- ISO 8569 1996 Measurement & Evaluation of Shock & Vibration Effects on Sensitive Equipment in buildings

A.6 Construction-related traffic noise goals

Where traffic noise levels increase by more than 2dBA from construction traffic or a temporary reroute, due to a road closure, further assessment is required using Roads and Maritimes approach to implementing the Road Noise Policy. This is described in Roads and Maritimes':

- Noise Criteria Guideline (NCG)

- Noise Mitigation Guideline NMG)

In any instance the only trigger for noise mitigation under the NMG shall be due to noise level increase. Further detail is in Appendix C.

A.7 Blasting Limits

Guidance on vibration and overpressure blasting limits should be based on:

- Australian Standard AS 2187.2-2006, 'Explosives - Storage, transport and use, Part 2: Use of explosives'
- British Standard BS 6472 British Standard BS 7385-2

Appendix B – Standard mitigation measures

The following standard actions and mitigation measures should be implemented on all construction projects. Note that assistance from Roads and Maritime Communication and Stakeholder Engagement is available to coordinate and deliver community consultation and notification. The team also has the latest noise fact sheets and letter templates.

Action required	Applies to	Details
Management measures		
Implementation of any project specific mitigation measures required.	Airborne noise	Implementation of any project specific mitigation measures required.
Implement community consultation or notification measures (refer to Appendix C for further details of each measure).	Airborne noise. Ground-borne noise & vibration.	Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night time period, any operational noise benefits from the works (where applicable) and contact telephone number. Notification should be a minimum of 7 calendar days prior to the start of works. For projects other than maintenance works more advanced consultation or notification may be required. Please contact Roads and Maritime Communication and Stakeholder Engagement for guidance. Website (If required) Contact telephone number for community Email distribution list (if required) Community drop in session (if required by approval conditions).
Site inductions	Airborne noise. Ground-borne noise & vibration	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • all project specific and relevant standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures.
Behavioural practices	Airborne noise	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.

Action required	Applies to	Details
Verification	Airborne noise Ground-borne noise & vibration	Where specified under Appendix C a noise verification program is to be carried out for the duration of the works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions.
Attended vibration measurements	Ground-borne vibration	Where required attended vibration measurements should be undertaken at the commencement of vibration generating activities to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.
Update Construction Environmental Management Plans	Airborne noise. Ground-borne noise & vibration.	The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.
Building condition surveys	Vibration Blasting	Undertake building dilapidation surveys on all buildings located within the buffer zone prior to commencement of activities with the potential to cause property damage
Source controls		
Construction hours and scheduling.	Airborne noise. Ground-borne noise & vibration.	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.
Construction respite period during normal hours and out-of-hours work	Ground-borne noise & vibration. Airborne noise.	Please refer to Appendix C for more details on the following respite measures: • Respite Offers (RO) • Respite Period 1 (R1) • Respite Period 2 (R2) • Duration Respite (DR)
Equipment selection.	Airborne noise. Ground-borne noise & vibration	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise and vibration benefits. Ensure plant including the silencer is well maintained.

Action required	Applies to	Details
Plant noise levels.	Airborne-noise.	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix H. Implement a noise monitoring audit program to ensure equipment remains within the more stringent of the manufacturers specifications or Appendix H.
Rental plant and equipment.	Airborne-noise.	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in Table 2.
Use and siting of plant.	Airborne-noise.	The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.
Plan worksites and activities to minimise noise and vibration.	Airborne noise. Ground-borne vibration.	Locate compounds away from sensitive receivers and discourage access from local roads. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noise activities should be scheduled for normal working hours. If the work can not be undertaken during the day, it should be completed before 11:00pm. Where practicable, work should be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters. If programmed night work is postponed the work should be re-programmed and the approaches in this guideline apply again.
Reduced equipment power	Airborne noise. Ground-borne vibration.	Use only the necessary size and power

Action required	Applies to	Details
Non-tonal and ambient sensitive reversing alarms	Airborne noise.	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. Consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.
Minimise disturbance arising from delivery of goods to construction sites.	Airborne noise.	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. Avoid or minimise these out of hours movements where possible.
Blasting regime	Airborne noise. Ground-borne vibration.	The noise and vibration impacts of blasting operations can be minimised by: • Choosing the appropriate blast charge configurations • Ensuring appropriate blast-hole preparation • Optimising blast design, location, orientation and spacing • Selecting appropriate blast times, and • Utilising knowledge of prevailing meteorological conditions. • AS 2187.2 Explosives-Storage, transport and use, Part 2: Use of Explosives provides more detailed advice on ground vibration and airblast overpressure impact minimisation options.
Engine compression brakes	Construction vehicles	Limit the use of engine compression brakes at night and in residential areas. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.
Path controls		

Action required	Applies to	Details
Shield stationary noise sources such as pumps, compressors, fans etc.	Airborne noise.	Stationary noise sources should be enclosed or shielded where feasible and reasonable whilst ensuring that the occupational health and safety of workers is maintained. Appendix D of AS 2436:2010 lists materials suitable for shielding.
Shield sensitive receivers from noisy activities.	Airborne noise.	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.
Receptor controls		
Structural surveys and vibration monitoring	Ground-borne vibration.	Pre-construction surveys of the structural integrity of vibration sensitive buildings may be warranted. At locations where there are high-risk receptors, vibration monitoring should be conducted during the activities causing vibration.
See Appendix C for additional measures	Airborne noise. Ground-borne vibration.	In some instances additional mitigation measures may be required.

Appendix C – Additional mitigation measures

C.1 Overview of additional mitigation measures

After standard noise mitigation measures (Appendix B) have been applied noise levels may still exceed noise management levels. Where exceedances remain consider implementing the following approaches in Tables C.1 to C.3 where feasible and reasonable. Note that assistance from Roads and Maritime Communication and Stakeholder Engagement is available to coordinate and deliver community consultation and notification. The team also has the latest noise fact sheets and letter templates.

The range of additional measures in Tables C.1 to C.3 are described below. Note in instances where there are many receivers above the NML it may not be practical to discuss the project with every receiver recommended below. Instead the community should be proactively engaged so they have an incentive to participate in discussion. Support from the community may be demonstrated from surveys, online feedback, contact phone numbers and community events.

Notification (letterbox drop or equivalent)

Advanced warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of a letterbox drop (or equivalent) detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of 5 working days prior to the start of works. The approval conditions for projects may also specify requirements for notification to the community about works that may impact on them.

Specific notifications (SN)

Specific notifications are letterbox dropped (or equivalent) to identified stakeholders no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. The specific notification provides additional information when relevant and informative to more highly affected receivers than covered in general letterbox drops.

The exact conditions under which specific notifications would proceed are defined in the relevant Additional Mitigation Measures (Tables C1 to C3). This form of communication is used to support periodic notifications, or to advertise unscheduled works.

Phone calls (PC)

Phone calls detailing relevant information made to identified/affected stakeholders within seven calendar days of proposed work. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs. Where the resident cannot be telephoned then an alternative form of engagement should be used.

Individual briefings (IB)

Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Project representatives would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project. Where the resident cannot be met with individually then an alternative form of engagement should be used.

Respite Offers (RO)

Respite Offers should be considered made where there are high noise and vibration generating activities near receivers. As a guide work should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The actual duration of each block of work and respite should be flexible to accommodate the usage of and amenity at nearby receivers.

The purpose of such an offer is to provide residents with respite from an ongoing impact. This measure is evaluated on a project-by-project basis, and may not be applicable to all projects.

Respite Period 1 (R1)

Out of hours construction noise in out of hours period 1 shall be limited to no more than three consecutive evenings per week except where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and no more than 6 evenings per month.

Respite Period 2 (R2)

Night time construction noise in out of hours period 2 shall be limited to two consecutive nights except for where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and 6 nights per month. Where possible, high noise generating works shall be completed before 11pm.

Duration Respite (DR)

Respite offers and respite periods 1 and 2 may be counterproductive in reducing the impact on the community for longer duration projects. In this instance and where it can be strongly justified it may be beneficial to increase the work duration, number of evenings or nights worked through Duration Respite so that the project can be completed more quickly.

The project team should engage with the community where noise levels are expected to exceed the NML to demonstrate support for Duration Respite.

Where there are few receivers above the NML each of these receivers should be visited to discuss the project to gain support for Duration Respite.

Alternative Accommodation (AA)

Alternative accommodation options may be offered to residents living in close proximity to construction works that are likely to experience highly intrusive noise levels (Tables C1-C3). The specifics of the offer will be identified on a project-by-project basis. Additional aspects for consideration shall include whether the highly intrusive activities occur throughout the night or before midnight.

Verification

Please see Appendix F for more details about verification of Noise and Vibration levels as part of routine checks of noise levels or following reasonable complaints. This verification should include measurement of the background noise level and construction noise. Note this is not required for projects less than three weeks unless to assist in managing complaints.

C.1 Airborne noise

Shorter tem impacts

For calculated noise levels the tables show additional measures to be implemented for each receiver depending on how far above the background noise level or NML the impact is. These measures are most appropriate for shorter term works.

For distance based assessments the distances where additional mitigation measures should be implemented are identified by cross referencing the Mitigation Levels in Table C1 with the plant and Mitigation Levels in Table D2 and D3. Note this is automatically completed by the Estimator spreadsheet.

As an example using distance based methods consider a NML of 45dBA in OOHW Period 1 in Table C1 below. Letter box drops should be completed at Mitigation Levels greater than 50dBA (NML+5dBA). From Table D2 this corresponds to receivers at distances equal to or less than 340m for a concrete saw.

Table C.1: Triggers for Additional Mitigation Measures - Airborne Noise

Predicted airborne $L_{Aeq(15min)}$ noise level at receiver			Additional mitigation measures	
Perception	dB(A) above RBL	dB(A) above NML	type[1]:	Mitigation Levels[2]:
All hours				
75dBA or greater			N, V, PC, RO	HA
Standard Hours: Mon - Fri (7am – 6pm), Sat (8am – 1pm), Sun/Pub Hol (Nil)				
Noticeable	5 to 10	0	-	NML
Clearly Audible	10 to 20	< 10	-	NML
Moderately intrusive	20 to 30	10 to 20	N, V	NML+10
Highly intrusive	> 30	> 20	N, V	NML+20
OOHW Period 1: Mon – Fri (6pm – 10pm), Sat (7am – 8am & 1pm – 10pm), Sun/Pub Hol (8am – 6pm)				
Noticeable	5 to 10	< 5	-	NML
Clearly Audible	10 to 20	5 to 15	N, R1, DR	NML+5
Moderately intrusive	20 to 30	15 to 25	V, N, R1, DR	NML+15
Highly intrusive	> 30	> 25	V, IB, N, R1, DR, PC, SN	NML+25
OOHW Period 2: Mon – Fri (10pm – 7am), Sat (10pm – 8am), Sun/Pub Hol (6pm – 7am)				
Noticeable	5 to 10	< 5	N	NML
Clearly Audible	10 to 20	5 to 15	V, N, R2, DR	NML+5
Moderately intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR	NML+15
Highly intrusive	> 30	> 25	AA, V, IB, N, PC, SN, R2, DR	NML+25

Notes (refer to detailed descriptions):

1 AA = Alternative Accommodation
V = Verification
IB = Individual briefings
N = Notification
R2 = Respite Period 2
DR = Duration Respite
R1 = Respite Period 1
PC = Phone calls
SN = Specific notifications
Perception = relates to level above RBL

2 NML = Noise Management Level (see Appendix D)
HA = Highly Affected (> 75 dB(A) - applies to residences only)

Longer term impacts

During long term works or at fixed sites the additional mitigation measures above may become less effective. In these situations at-receiver noise mitigation may be considered where feasible and reasonable if options for at source noise mitigation and management measures have been exhausted.

At receiver mitigation may include temporary window and door screens, temporary localised shielding or permanent forms of mitigation.
Feasible and reasonable considerations for providing at-receiver treatments should include:

- time of day of the noise increase and exceedence of criteria
- time of use of affected receivers
- how many decibels the noise levels are to increase
- how long the mitigation will provide benefit to the receiver during the project
- optimal design of acoustic sheds and noise barriers/hoardings

C.2 Ground-borne noise

Table C.2: Triggers for Additional Mitigation Measures - Ground-borne Noise

Predicted ground-borne $L_{Aeq(15min)}$ noise level at receiver		Additional mitigation measures	
perception	dB(A) above GB NML	type[1]:	apply to[2]:
Standard Hours: Mon - Fri (7am – 6pm), Sat (8am – 1pm), Sun/Pub Hol (Nil)			
N/A	Vibration only applicable during standard hours		
OOHW Period 1: Mon – Fri (6pm – 10pm), Sat (7am – 8am & 1pm – 10pm), Sun/Pub Hol (8am – 6pm)			
Clearly Audible	< 10	N	All
Moderately intrusive	10 to 20	V, N, R1, DR SN	All
Highly intrusive	> 20	V, IB, N, PC, SN, R1, DR	All
OOHW Period 2: Mon – Fri (10pm – 7am), Sat (10pm – 8am), Sun/Pub Hol (6pm – 7am)			
Clearly Audible	< 10	V, N, SN	All
Moderately intrusive	10 to 20	AA, V, IB, N, PC, RP, SN, R2, DR	All
Highly intrusive	> 20	AA, V, IB, N, PC, RP, SN, R2, DR	All

Notes:

1 AA = Alternative accommodation
V = Validation of predicted noise levels
IB = Individual briefings
N = Notification box drops
R2 = Respite Period 2
DR = Duration Respite
R1 =Respite Period 1
PC = Phone calls
SN = Specific notifications

2 All affected receivers

C.3 Vibration

Table C.3: Triggers for Additional Mitigation Measures - Vibration

Predicted ground-borne $L_{Aeq(15min)}$ noise level at receiver perception	dB(A) above GB NML	Additional mitigation measures type[1]:	apply to[2]:
Standard Hours: Mon - Fri (7am – 6pm), Sat (8am – 1pm), Sun/Pub Hol (Nil)			
Predicted Vibration Exceeds Maximum Levels		V, N, RP	All
OOHW Period 1: Mon – Fri (6pm – 10pm), Sat (7am – 8am & 1pm – 10pm), Sun/Pub Hol (8am – 6pm)			
Predicted Vibration Exceeds Maximum Levels		V, IB, N, RO, PC, RP, SN	All
OOHW Period 2: Mon – Fri (10pm – 7am), Sat (10pm – 8am), Sun/Pub Hol (6pm – 7am)			
Predicted Vibration Exceeds Maximum Levels		AA, V, IB, N, PC, RP, SN	All

Notes:

1 AA = Alternative accommodation
V = Validation of predicted noise levels
IB = Individual briefings
N = Notification drops
RO = Project specific respite offer
PC = Phone calls
SN = Specific notifications

2 All affected receivers

C.4 Construction related traffic noise

Management of construction related traffic or traffic reroutes noise should as a minimum include the following controls:

- Scheduling and routing of vehicle movements
- Speed of vehicles
- Driver behaviour and avoidance of the use of engine compression brakes
- Ensuring vehicles are adequately silenced before allowing them to access the site

Consideration must be given to the following measures where feasible and reasonable:

- temporary noise barriers
- at-receiver noise mitigation

Feasible and reasonable considerations should also include:

- time of day of the noise increase and how far above the criteria the noise is expected to be
- time of use of affected receivers
- how many decibels the noise levels are expected to increase above the existing traffic noise
- how long the mitigation will provide benefit to the receiver during the project

Appendix D – Noise assessment using distance categories

D.1 Establishing background noise levels and distance categories

The following background noise levels from Australian Standard 1055 may be used as an estimate for projects less than three weeks in duration. However, existing data from other projects or short term attended noise measurements should be used to assist in establishing noise management levels where possible.

Table D.1 Typical background noise levels and applicable Noise Management Level

Area type	Description of area surrounding road project		Day 0700-1800	Evening 1800-2200	Night 2200-0700
Rural/ Suburban	Areas with negligible transportation or very limited local traffic, typically light vehicles only. 100m or more from the road.	Background Level (L_{A90})	40	35	*30*
		NML	**50**	**40**	**35**
Suburban/ Urban	Areas with low density transportation. Typically local traffic, light vehicles, intermittent traffic flow	Background Level (L_{A90})	45	40	35
		NML	**55**	**45**	**40**
Urban	Areas with medium density transportation or some commerce or industry. Typically traffic is moving from one area to another (light & heavy vehicles) with heavy peak hour traffic movement. May be on or close to bus route/ light rail.	Background Level (L_{A90})	50	45	40
		NML	**60**	**50**	**45**
Urban/ Industrial	Areas with dense transportation with some commerce of industry. Typically on or near an arterial or sub arterial road OR near rail line; 24 hour traffic movement	Background Level (L_{A90})	55	50	45
		NML	**65**	**55**	**50**
Non residential receivers	Classrooms at schools and other educational institutions	**NML**[1]	**55**	-	-
	Hospital wards and operating theatres	**NML**[2]	**65**	**65**	**65**
	Place of worship	**NML**[1]	**55**	**55**	**55**
	Active recreation	**NML**	**65**	**65**	-
	Passive recreation	**NML**	**60**	**60**	-
	Industrial premise	**NML**	**75**	**75**	**75**
	Offices, retail outlets	**NML**	**70**	**70**	**70**

NML[1] = Assumed equivalent external noise level with windows open, NML[2] = Assumed equivalent external noise level with windows shut

D.2 Plant Items, Scenarios and noise affected distances

Table D.1 - Affected Distances for Individual Plant Items

Individual Plant Item[1]	No. Units	Affected Distance, metres[2]								
Mitigation Level (dBA)		**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75[3]**
Rural community										
Power generator / Concrete pump	1	390	270	185	130	85	50	30	25	15
Vibratory Roller / Concrete Truck	1	525	365	250	175	120	75	45	25	20
Chainsaw / CMI SF400 Paver / Jack hammer / Bored Piling Rig	1	760	525	365	250	175	120	75	45	25
Concrete Saw / Asphalt Profiler / CAT D10	1	1010	705	490	340	235	160	110	70	40
Airtrack Drill / Diamond Grinding	1	1750	1250	875	610	420	290	200	140	95
Urban community										
Power generator / Concrete pump	1	500	335	220	145	95	55	35	25	15
Vibratory Roller / Concrete Truck	1	690	460	305	200	135	85	50	30	20
Chainsaw / CMI SF400 Paver / Jack hammer / Bored Piling Rig	1	1010	690	460	305	200	135	85	50	30
Concrete Saw / Asphalt Profiler / CAT D10	1	1355	940	635	425	280	185	120	75	45
Airtrack Drill / Diamond Grinding	1	2425	1675	1175	805	545	360	240	155	105

Notes:

1. Typical plant items operating individually for road construction works
2. Distances may be halved where there is no direct line of sight between the plant and receiver
3. Highly noise affected

Table D.2 - Affected Distances for construction scenarios

Construction scenario	Affected Distance, metres[1]								
Mitigation Level (dBA)	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75[2]**
Rural community									
Road furniture installation	565	390	265	185	125	75	35	25	15
Compound operation	755	525	360	250	170	115	65	35	20
Site establishment / Drainage infrastructure	815	565	390	265	185	125	75	40	25
Utility works	875	605	420	290	195	135	85	45	25
Crushing plant / Paving / Asphalting / Re-surfacing works	1010	700	485	335	230	155	105	60	30
Retaining walls / noise walls / Compound establishment	1085	755	525	360	250	170	115	65	35
Bridge works / Local road works	1165	815	565	390	265	185	125	75	40
Corridor clearing	1245	875	605	420	290	195	135	85	45
Demolition work	1335	940	650	450	310	215	145	95	50
Bulk earthworks	1430	1010	700	485	335	230	155	105	60
Urban community									
Road furniture installation	745	500	330	215	140	85	45	25	15
Compound operation	1010	685	460	305	200	125	75	40	25
Site establishment / Drainage infrastructure	1090	740	500	330	215	140	85	45	25
Utility works	1170	800	540	360	235	150	95	50	25
Crushing plant / Paving / Asphalting / Re-surfacing works	1355	935	635	425	280	180	115	70	35
Retaining walls / noise walls / Compound establishment	1455	1010	685	460	305	200	130	75	40
Bridge works / Local road works	1560	1085	740	500	330	215	140	85	45
Corridor clearing	1670	1170	800	540	360	235	155	95	50
Demolition work	1790	1260	865	585	390	255	165	105	60
Bulk earthworks	1910	1355	935	635	425	280	180	115	70

Notes:
1. Distances may be halved where there is no direct line of sight between the plant and receiver
2. Highly noise affected

Appendix E – Sleep disturbance

Table E.1 – Sleep disturbance distance for the operation of individual plant items

Plant Item	Affected Distance	
	Open window	
	L_{Amax} 65 dB(A) external	
	Rural	Urban
Power generator / Concrete pump	50	55
Vibratory Roller / Concrete Truck	95	105
Chainsaw / CMI SF400 Paver	120	135
Jack hammer / Bored Piling Rig	175	200
Concrete Saw / Asphalt Profiler	160	185
CAT D10	235	280
Airtrack Drill / Diamond Grinding	270	335

Table E.2 – Sleep disturbance distance for the construction scenarios

Construction scenario	Affected Distance	
	Open window	
	L_{Amax} 65 dB(A) external	
	Rural	Urban
Site establishment / utility, property, service adjustment / drainage infrastructure / Compound operation / road furniture installation	85	95
Compound site establishment	115	130
Re-surfacing works	155	180
Structural demolition / crushing plant / bridge works	170	200
Corridor clearing / bulk earthworks / local road works	230	280
Retaining walls / noise walls / paving / asphalting	270	330

Appendix F – Noise and vibration verification

This appendix describes the approaches to be used where additional noise mitigation measures have been applied that include noise level verification.

The attended measurements will need to be carried out by an appropriately trained person in the measurement and assessment of construction noise and vibration, who is familiar with the requirements of the relevant standards and procedures.

The attended measurements shall include evaluation of both construction noise and background noise levels compared with the predicted and estimated levels used in the assessment.

The results of the attended noise measurements shall be used to update the Construction Noise and Vibration Management Plan and other relevant environmental management documents.

F.1 Noise levels for plant and equipment

All plant and equipment used for construction must have operating Sound Power or Sound Pressure Levels less than or equal to those in Table F1. For construction equipment not listed in Table F1, reference should be made to the typical noise levels in Australian Standard AS 2436-2010, British Standard BS 5228-1 or DEFRA noise database (2006).

The noise levels in Table F1 can also be used as a guide in the prediction of $L_{Aeq(15minute)}$ construction noise. In doing so, the predicted $L_{Aeq(15minute)}$ noise levels will be dependent on several factors including, but not limited to the duration of the construction activities, the number of plant items and their location on site in relation to the nearest receivers.

Attended measurements are to be undertaken within a period of 14 days of equipment arriving on site to confirm that the operating noise levels of all plant items comply with the maximum levels in Table F1. The attended measurements are to be repeated on a three-monthly basis to ensure that noise from individual plant items are still within the acceptable noise range.

F.2 Noise and vibration verification in the community

Where additional mitigation measures require the spot check verification of noise levels, attended measurements are to be undertaken within a period of 14 days from the commencement of construction activities. The purpose of these measurements is to confirm that:

- noise and vibration levels from construction in the adjacent community are consistent with the predictions in the noise assessment, approval and/or licence conditions.
- Mitigation is appropriate for the range of background noise levels at receivers affected by the works. Where the background noise levels differ from those assumed in the noise assessment then refinement of mitigation measures may be required and the CEMP amended.

The attended measurements must be undertaken at:

- the potentially most exposed receivers
- locations further from the works and existing noise sources which may have lower background noise levels.

Noise measurements shall be undertaken consistent with the procedures documented in AS1055.1-1997 Acoustics - Description and Measurement of Environmental Noise - General Procedures. Vibration measurements shall be undertaken in accordance with the procedures documented in the OEH's Assessing Vibration - a technical guideline (2006) and BS7385 Part 2-1993 Evaluation and measurement for vibration in buildings.

For projects with a duration of greater than three months, the attended measurements are to be repeated on a three-monthly basis as part of the audit cycle to ensure that noise and vibration levels in the adjacent community remain consistent with the predicted levels in the noise assessment, approval and/or licence conditions. For projects with a duration of less than three months, or where out of hours works are required, the attended measurements must be undertaken at the time intervals described in the assessment, out of hours assessment, approval and/or licence conditions.

Table F.1: Highest allowable noise levels for construction equipment

Activity	Description of Activity	Plant/ Equipment	L_{Aeq} SWL	L_{Aeq} at 7m	Assumptions for quantitative assessment		
					No. Units	Activity total L_{eq} SWL	Activity total L_{A1} SWL
Mobilisation & Site Establishment	Installing construction boundary hoardings/ fences and traffic barriers	Truck (medium rigid)	103	78	4 per hour	**115**	**116**
		Road truck	108	83	4 per hour		
		Scissor Lift	98	73	1		
		Franna crane	98	73	1		
Utility, property, service adjustment	Adjustment of property boundaries (where required); relocation of services	Excavator (tracked) 35t	110	85	1	**116**	**116**
		Dump truck	110	85	4 per hour		
		Franna crane 20t	98	73	1		
		Pneumatic hammer	113	88	-		
		Concrete saw	118	93	1		
		Vacuum truck	109	84	-		
		Backhoe	111	86	-		
		Power generator	103	78	1		
Corridor Clearing	General land clearing, tree and stump removal, topsoil stripping, loading	Bulldozer D9	116	91	1	**121**	**Not recommended as OOHW**
		Excavator (tracked) 35t	110	85	1		
		Chainsaw 4-5hp	114	89	2		
		Tub grinder/ mulcher 40-50hp	116	91	1		
		Dump truck	110	85	4 per hour		
	House/ building demolition	Excavator (tracked) 35t	110	85	1	**122**	**Not recommended as OOHW**
		As above + hydraulic hammer	122	97	1		
		Front end loader 23t	112	87	1		
		Dump truck	108	83	4 per hour		
Rock crushing	Crushing and screening of building waste/ rock material for re-use on site	Rock crusher	118	93	1	**118**	**Not recommended as OOHW**
		Bulldozer D9	116	91	1		
		Excavator (tracked) 35t	110	85	1		
		Dump truck	110	85	4 per hour		

Activity	Description of Activity	Plant/ Equipment	L_{Aeq} SWL	L_{Aeq} at 7m	Assumptions for quantitative assessment		
					No. Units	Activity total L_{eq} SWL	Activity total L_{A1} SWL
Bulk earthworks	Formation of road alignment. Excavation of soil and rock, hammering/rock breaking, drilling, loading, haulage, compaction of fill areas, grading	Bulldozer D9	116	91	1	**123**	**Not recommended as OOHW**
		Scraper 651	110	85	1		
		Excavator (tracked) 35t	110	85	1		
		As above + hydraulic hammer	122	97	1		
		Grader	113	88	1		
		Dump truck	110	85	8 per hour		
		Compactor	106	81	1		
		Roller (large pad foot)	109	84	-		
		Water cart	107	82	-		
Drainage infrastructure	Excavation of trenches and pits; Delivery and placement of precast pipes and pits; filling and compacting.	Backhoe	110	85	-	**115**	**116**
		Franna crane 20t	98	73	1		
		Excavator (tracked) 35t	110	85	1		
		Concrete truck	109	84	4 per hour		
		Truck compressor	75	50	1		
		Vibratory roller	109	84	1		
		Road truck	108	83	4 per hour		
Bridge works	Casting; concrete pours; Placement of pre-cast elements; Piling (mainly bored); and Demolition.	Franna crane 20t	98	73	1	**120**	**124**
		Piling rig - driven	116	91	-		
		Piling rig - bored	112	87	1		
		Power generator	100	75	1		
		Concrete pump	102	77	1		(Piling not recommended as OOHW)
		Concrete truck	109	84	4 per hour		
		Compressor	109	84	1		
		Pneumatic hammer	115	90	-		
		Welding equipment	105	80	-		

Activity	Description of Activity	Plant/ Equipment	L_{Aeq} SWL	L_{Aeq} at 7m	Assumptions for quantitative assessment		
					No. Units	Activity total L_{eq} SWL	Activity total L_{A1} SWL
Retaining walls/ noise walls	Construction of retaining walls & noise walls	Piling rig - bored	112	87	1	**119**	**130**
		Power generator	103	78	1		
		Mobile crane	113	88	1		
		Concrete vibrator	113	88	1		(Piling and air track drill not recommended as OOHW)
		Concrete pump	109	84	1		
		Welding equipment	105	80			
		Excavator (tracked) 35t	112	87	1		
		Air track drill	124	99			
Paving/ asphalting (inc concrete sawing)	Delivery of raw materials. Placement of surface material. Saw cutting.	Pavement laying machine	114	89	1	**118**	**130**
		Dump truck	110	85	4 per hour		
		Asphalt truck & sprayer	103	78	1		
		Concrete truck	109	84	1		
		Smooth drum roller	107	82	1		
		Concrete saw	118	93	1		
Compounds	Deliveries. Plant and equipment. Maintenance. Office areas. Storage areas.	Front end loader	91	66	1	**114**	**116**
		Excavator (tracked) 35t	110	85	-		
		Road truck	108	83	4 per hour		
		Compressor	109	84	1		
		Welding equipment	105	80	1		
		Light vehicles	88	63	12 per hour		
		Power generator	103	78	1		
Road furniture installation	Signposting and line marking	Road truck	108	83	4 per hour	**110**	**116**
		Scissor lift	98	73	1		
		Franna crane 20t	98	73	1		
		Line marking truck	108	83	1		

Activity	Description of Activity	Plant/ Equipment	L_{Aeq} SWL	L_{Aeq} at 7m	Assumptions for quantitative assessment		
					No. Units	Activity total L_{eq} SWL	Activity total L_{A1} SWL
Construction Compound Site Establishment		Chainsaw 4-5hp	114	89	2	**119**	
		Pneumatic hammer	113	88	-		
		Fixed crane	113	88	1		
		Front end loader	112	87	1		
		Excavator (tracked) 35t	110	85	-		
		Grader	113	88	1		
		Vibratory roller	109	84	-		**Not recommended as OOHW**
		Concrete truck	109	84	4 per hour		
		Dump truck	110	85	4 per hour		
		Water cart	107	82	-		
		Concrete vibrator	113	88	1		
		Concrete pump	109	84	1		
		Power generator	103	78	1		
		Light vehicles (eg 4WD)	103	78			
Local Roads Works		Bulldozer D9	116	91	1	**120**	**128**
		Excavator (tracked) 35t	110	85	-		
		Chainsaw 4-5hp	114	89	2		
		Tub grinder/ mulcher 40-50hp	116	91	1		
		Front end loader	112	87	1		
		Scraper 651	110	85	1		
		Backhoe	111	86	-		
		Compactor	106	81	1		
		Dump truck	110	85	4 per hour		
		Road truck	108	83	4 per hour		
		Water cart	107	82	-		
Re-surfacing works	Milling the asphalt to expose	Daymakers	98	73	2	**118**	**123**

Activity	Description of Activity	Plant/ Equipment	L_{Aeq} SWL	L_{Aeq} at 7m	Assumptions for quantitative assessment		
					No. Units	Activity total L_{eq} SWL	Activity total L_{A1} SWL
	the underlying concrete, then laying new asphalt	Pavement profiler	117	92	1		
		Dump truck	110	85	4 per hour		
		Front end loader	112	87	1		
		Pavement laying machine	114	89			
		Asphalt truck & sprayer	106	81			
		Smooth drum roller	107	82			

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Transport Roads & Maritime Services

Appendix C2 (I) Air Quality Management Sub Plan

PRM Air Quality Management Sub Plan

PROGRESSIVE RISK MANAGEMENT

Air Quality Management Plan

URBNSURF Sydney Project

Corner Hill Road and Holker Busway, Sydney Olympic Park NSW

URBNSURF Sydney Pty Ltd

P034987.003

Version C | August 2021

Document Control

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Prepared by:		**Technical Review by:**		**Authorised for Issue by:**	
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Date:	XX August 2021				

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1. Introduction

Progressive Risk Management Pty Ltd (PRM) were engaged by URBNSURF Sydney Pty Ltd (URBNSURF) to prepare an Air Quality Management Plan (AQMP) for the URBNSURF Sydney (USS) Project located at the Pod B P5 Carpark, Hill Road, Sydney Olympic Park NSW (the site).

1.1. Background

URBNSURF Sydney will be a world-class sport, recreation, leisure, tourism and event facility orientated around a surfing lagoon sited at Pod B P5 Carpark, Hill Road, Sydney Olympic Park.

The project is State Significant Development with development consent conditions granted by Minister of Planning (ref: SSD 7942, dated 20 December 2017). Prior to commencement, condition C2(l) of the development consent requires a AQMP to be included within the construction environmental management plan, which shall be prepared and implemented. The condition has been applied to ensure any potential impacts to local air quality as a result of development activities are minimised and managed.

1.2. Objective

The objective of the AQMP is to detail the control measures to be implemented during construction in accordance with the regulatory framework and applicable development consent conditions. As a result, this aims to achieve zero complaints in relation to air quality. The AQMP informs the Construction Environmental Management Plan to be prepared and implemented for the site.

1.3. Regulatory Framework

The following legislation, regulations and industry guidance has been considered in the preparation of this report:

- NSW Protection of the Environment Operations Act (1997).
- NSW Protection of the Environment Operations (Clean Air) Regulation (2010).
- NSW Protection of the Environment Operations (General) Regulation (2009).
- Department of Environment: National Environment and Protection (Ambient Air Quality) Measure, as updated February 2016.
- AS/NZS 3580.1.1 (2006): Methods for sampling and analysis of ambient air, Part 1.1 Guide to siting air monitoring equipment.
- National Occupational Health and Safety Commission (NOHSC) "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust [NOHSC: 3003 (2005)] (MFM).

1.4. Development Consent Conditions

Specific to the project, the AQMP has been prepared in accordance with the requirements outlined in the development consent. An evaluation of the AQMP compared to the development consent conditions is provided in **Table 1** below.

Table 1: Development Consent Condition Requirements

Requirement	Response
Condition C2(l) - Air Quality Management Plan to detail how construction impacts on local air quality will be minimised and managed. This Plan must include identification of potential sources of airborne pollutants and how these will be monitored and managed.	**Compliant** Refer to **Section 3** and **Section 4.**

Table 1: Development Consent Condition Requirements	
Requirement	**Response**
Condition C7(i) - include a suitable airborne asbestos fibre monitoring program for all asbestos removal work areas.	**Compliant** Refer to **Section 4.**
Condition D24 - Adequate dust control measures shall be detailed in the CEMP for the development (refer to Condition C2) and implemented to prevent dust from affecting the amenity of the neighbourhood during construction.	**Compliant** Refer to **Section 3.4.**

2. Site Information

2.1. Site Identification

A summary of site identification and surrounding is provided in **Table 2**.

Table 2: Site Identification	
Detail	**Information**
Site Address:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Lot Parcel:	Part Lot 71 in Deposited Plan 1191648
Site Area:	3.2 hectare
Local Council:	City of Parramatta
Current Zoning:	RE1 Public Recreation Zone, under the State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009
Current Site Use:	Pod B P5 Carpark
Proposed Future Use:	URBNSURF surf park (public recreation facility)
Surrounding Land Use:	**North**: Millennium Parklands, the Newington Armory and a mixture of commercial and residential buildings. **South:** Haslams Creek, parklands, a conservation area and Sydney Olympic Park facilities (commercial buildings, stadiums and arenas). **East:** A carpark, recreational facilities (BMX track and archery centre) and wetland. **West:** A car park, vacant private land with some commercial operations beyond.

3. Air Quality Management Principles

The following principles outline the overall approach to the air quality management for the site:

- Ensure appropriate measures are implemented to address the relevant conditions outlined in the Development Consent.
- Ensure best management practice controls and procedures are implemented during the construction activities to avoid or minimise the risk of air quality and odour impacts.
- Minimise dust generation and any other potential air quality impacts as a result of construction activities.
- Implement proactive measures to mitigate impacts at the source, path and receiver to minimise complaints from and potential impacts to sensitive receivers.
- Manage potential air quality issues so they are identified and controlled to meet legislative requirements.

3.1. Timeline of Events

Establishment of air quality controls will generally occur in the following order:

1. Construction of site boundary fencing to include solid screen or temporary fence with shade cloth.
2. A stabilised construction access / egress will be established where construction traffic enters or leave from a public road.
3. Training will be provided to all Project personnel, including subcontractors on the requirements of this AQMP through inductions and toolbox meetings.
4. Air monitoring programme will be established and undertaken with data reviewed and reported periodically.
5. Task specific controls, such as dust suppression, to be employed during construction activities, as required.
6. Controls will be reviewed periodically to assess effectiveness and rectification of controls will occur, as required.
7. All controls to remain for the duration of all construction activities, until permanent fixtures and controls are in place.

3.2. Roles and Responsibilities

Responsibilities for implementation of the various activities described in the AQMP are summarised in **Table 3** below:

Table 3: AQMP Roles and Responsibilities

Role	Responsibility
Principal Contractor	• Implementation of AQMP. • Induct all personnel including reference to AQMP. • Employ methods to mitigate impacts and rectify non-conformances and incidents as required.
Principal Contractor and Subcontractors	• Implementation of appropriate environmental controls during site works.
Environmental Consultant	• Conduct site environmental monitoring and compile reports. • Assist in addressing non-conformances as required. • Undertake necessary environmental monitoring (e.g. dust deposition).

3.3. Potential Sources of Airborne Pollutants

During the construction phase of the project, there are several sources that can adversely impact the air quality of the site and neighbouring areas. Pollutants and their potential

sources are outlined in **Table 4** below.

Table 4 Airborne Pollutant Sources	
Source	**Airborne Pollutant**
Bulk excavations	Dust and Diesel particulates, asbestos fibres.
General construction activities (cutting, grinding, welding etc.)	Dust particulates and fumes.
Material handling	Dust particulates.
Machine and plant operation	Diesel particulates.
Fuels and oils	Aromatic hydrocarbons.
Stockpiles	Dust particulates.
Waste storage	Putrescible odours.
Unexpected finds	Unidentified odours, fibrous material.
Roadways and access routes	Dust particulates.
Local weather conditions	Dust particulates.
Activities outside site boundaries	Any number of airborne pollutants originating from activities outside the control of the Principal Contractor.

3.4. Control Measures

Control measures to fulfil the Air Quality Management obligations during the construction phase are outlined in **Table 5** below. Furthermore, a full operational breakdown is included in Section 3.4 of the CEMP.

Table 5: Air Quality Control Measures	
Control Measure	**Function**
Induction procedures and pre-start meetings.	Personnel will receive the appropriate inductions and information regarding the procedures and controls to be employed on site in relation to air quality.
Timing of works.	During adverse wind conditions, activities should be assessed and modified as appropriate to reduce the generation of dust.
Air monitoring programme and periodic checks.	An air monitoring programme will be established to monitor for environmental dust and asbestos fibres.
Plant and equipment are to be regularly inspected and maintained to ensure it is running optimally.	Use Pre-start Checks and Logbooks as appropriate to record and determine suitability of inspection and maintenance. This will reduce the likelihood of smoke emissions.
Cleaning of public roads used by project related trucks.	Removes dust and debris originating from the construction site on the adjacent roadway.
Use of established entry for trucks and vehicles.	Reduces mud and spoil from exiting the construction site and generating potential dust. Rumble grids and wash bays will be utilised where required as detailed in section 3.4 of the CEMP.
Vehicle/traffic management.	Ensures speed limits (e.g. 10 km/hour onsite) are adhered to, reducing the likelihood of dust generation. Also means egress is controlled so trucks remain off disturbed ground where possible.

Table 5: Air Quality Control Measures	
Control Measure	**Function**
Airborne dust to be kept to a minimum using dust suppression as appropriate.	Dust suppression methods will be available at all times to ensure any dust generation can be controlled. This will include targeted dust suppression/wetting for specific activities, maintenance of stockpiles and high traffic areas. Refer to Asbestos Management Plan and Section 3.4 of the CEMP for specific dust controls. These controls mitigate the risk of potential respirable asbestos fibres being released.
All loads to be covered when leaving site.	Remains in line with legislative requirements and reduces likelihood of dust generation and spillage.
Earthworks and exposed areas / long-term soil stockpiles are to be stabilised as soon as practicable following completion of works.	Reduces the likelihood of dust generation. Further details are included in the SWMP and Section 3.4 of the CEMP. This includes the following: • covering stockpiles with geofabric or black plastic, OR • seeding with temporary winter crop cover, OR • sealed with a soil binder or tackifier.
Where there is a risk of concrete cutting / sawing or drilling resulting in concrete dust being blown to nearby receivers, use dust suppression techniques such as water sprays.	Ensures respirable dusts are not made airborne.
Ensure there is an adequate supply of water on site for effective dust suppression (using non-potable water supply where practicable).	Facilitates the various dust suppression methods employed. Where possible recycled or site captured water will be used for dust suppression. As listed in the CEMP, a water cart is available to undertake tasks. Standard use of water equipment (hoses etc.) apply.
Unless being reused on site, remove materials that have a potential to produce dust from site as soon as possible.	Reduces the likelihood of dust generation.
Minimise disturbance to surfaces at risk from wind erosion.	Minimises the surface area of exposed soil thus reducing the likelihood of dust generation.
Odorous material that may cause a disturbance to nearby receivers shall be removed from site as soon as practicable or, if stockpiling is required, stockpiled away from sensitive receivers, and covered to prevent fugitive emissions.	Eliminates potential for nearby receptors to be exposed to odorous emissions.
Spill response.	Maintain provisions (i.e. spill kit) to clean up accidental spills as soon as practicable.
Unexpected finds protocol.	Utilising this procedure will ensure the appropriate controls are put in place should any odorous material is uncovered during all civil activities (bulk earthworks, piling, material handling etc.). The Principal Contractors Unexpected Finds Protocol includes appropriate contingencies. It is noted that previous investigations have not reported a significant source of airborne contaminants. Odours resulting from the disturbance of Potential Acid Sulfate Soil dependant on the acid sulfate soil investigation proposed during construction
Contaminated soil excavation and handling.	All controls for the excavation and handling of potentially asbestos contaminated soil are detailed in the Asbestos Management Plan (PRM Reference P034987.005).

4. Maintenance and Monitoring

4.1. Inspections

Routine inspections of control measures will be undertaken by Contractor personnel. Inspections will be performed in conjunction with the sub-plan maintenance checks and documented on the pro-forma checklist included in the CEMP. Further details pertaining to air quality controls are provided in **Table 6**below.

Table 6: Air Quality Controls Inspection Record

Detail	Record (circle yes or no)	Corrective Actions
NAME: DATE: SIGNATURE:	• Any dust leaving site boundaries? **Y/N** • Water and dust suppression equipment available? **Y/N** • Boundary fence adequately covered with shade cloth or similar? **Y/N** • Work appropriate for weather conditions? **Y/N** • Dust suppression methods utilised at source? **Y/N** • Stockpiles adequately covered/managed? **Y/N** • Monitoring programme being conducted? **Y/N** • Are roadways clear of spoil? **Y/N** • Waste appropriately stored? **Y/N** • Fuel and oil appropriately stored? **Y/N** • Are local conditions generally free of airborne pollutants (odours, dust, smoke etc.)? **Y/N**	Applicable to any inspected item where **"No"** specified:

4.2. Air Monitoring Programme

The Principal Contractor in consultation with the site Occupational Hygienist/LAA, will facilitate an air monitoring programme for both environmental dust and asbestos fibres. Air monitoring will be conducted during earthworks activities and during construction activities at the discretion of the Occupational Hygienist/LAA.

Environmental dust will be monitored over a representative period during construction and earthworks activities. The timing and methodology of the monitoring will be determined by the Occupational Hygienist/LAA in consultation with the Principal Contractor and client.

The *NSW EPA's Approved Methods for the Modelling and Assessment of Air Pollutants* sets out applicable impact assessment criteria for a number of air pollutants. In addition to the NSW EPA criteria, the NEPM (ambient air quality) defines the overarching ambient air quality goal. This includes PM_{10}, $PM_{2.5}$, Total Suspended Particles (TSP) and Total Deposited Dust (TDD).

The objective of the monitoring will be to employ the appropriate method to obtain representative data, to be compared against the relevant environmental dust criteria. Methods for consideration include real-time dust tracking or dust deposition gauges.

The following proposed programme is to be undertaken:

Dust: 4 perimeter and 1 background particulate deposition monitoring locations.

Volatiles: PID screening (non-detect).

Odour: On-going monitoring by site personel as per section 3.4 of the CEMP and Unexpected Finds protocol. No nuisance odours are to be encountered by sensitive receptors beyond the site boundary.

Other: Unexpected finds protocol and operational response procedure.

Note: The proposed programme can be refined and/or changed based on site considerations.

Asbestos Fibre Air monitoring will be conducted in-line with the procedures outlined in the

site Asbestos Management Plan (PRM Reference P034987.003).

An appropriately qualified Occupational Hygienist/LAA will carry out all air monitoring in conjunction with periodic assessment of controls.

Table 7: Air Quality Monitoring Programme

Detail	Performance Outcome	Monitoring Requirement
Asbestos	Air monitoring results <0.01 fibres/mL as per AMP. Respond to action level exceedances as per SafeWork NSW requirements, as necessary.	Air monitoring results programme to be implemented by the SafeWork NSW LAA as per the AMP (ref: P034987.005).
Vehicle Exhaust	No visible smoke more than 10 seconds duration as per POEO Clean Air Regulation 2010.	Vehicle prestart checklist. Inspection checklist to be completed by the Principal Contractor.
Dust	Effective management of dust during construction. No baseline dust deposition data is available. The NSW EPA criteria of 4g/m^2/month has been adopted.	Deposition gauges <4g/m^2/month at four locations surrounding the site and analysed in accordance with: • NSW EPA Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016. • AS/NZS 3580.10.1 2016 Methods for sampling and analysis of ambient air – determination of particulates – deposited matter – gravimetric method.
Nuisance Odours	No unresolved community or stakeholder complaints.	Inspection checklist to be completed by the Principal Contractor. Respond to unexpected finds and complaints, as necessary.
Acid Sulfate Soils	If acid sulfate soils are detected at the site. Air monitoring for hydrogen sulfide would be warranted.	Environmental Consultant to establish suitable monitoring scope to assess compliance with SafeWork Australia's airborne contaminant exposure standards.
Other contaminants	If significant sources of other contaminants (e.g. hydrocarbons) are encountered.	Environmental Consultant to establish suitable monitoring scope to assess compliance with SafeWork Australia's airborne contaminant exposure standards.

5. Response Procedures

5.1. Operational Response Process

Where there is evidence of airborne pollutants (eg. dust, asbestos fibres, hydrocarbons, odours) arising from construction activities, the following will be undertaken:

- The project manager and site manager/supervisors will assess the source and extent of the exceedance.

The Principal Contractor will undertake an investigation and assess the current controls being applied.

- If required, work will stop until the appropriate controls are put in place.
- Controls will be increased, as required.
- Any corrective action will be recorded in the site Safety Environment Quality (SEQ) folder database and reported to the Health Safety Environment Quality (HSEQ) Manager.
- Note: For asbestos fibre action levels, please refer to Table 6 in the Asbestos Management Plan. Ie. There should be no exceedance of the background level of 0.01 fibre/ml for asbestos fibres. Please also refer to Section 3.4 of the CEMP and the Unexpected Finds Protocol as required.

5.2. Complaint Response

All complaints received in relation to air quality will be responded to in accordance with the Stakeholder Communication and Consultation Procedure. This provides details on how to receive, handle, respond to and record and action any community complaints.

Upon receipt of a complaint from the community, preliminary investigations will be undertaken as soon as practicable to determine the likely causes of the complaint using information such as weather data, inspection checklists and monitoring data. A response will be provided as soon as practicable, which may include the provision of relevant monitoring data.

5.3. Complaints Register

All community complaints must be recorded on a complaint register and the HSEQ manager must be notified of all complaints received.

6. Limitations

This report is confidential and has been prepared by Progressive Risk Management (PRM) for URBNSURF Sydney Pty Ltd (the client) in accordance with the terms and conditions provided within the Consultancy Agreement between the client and PRM. This report may only be used and relied upon by the client and must not be copied to, used by or relied upon by any person other than the client. If a third party (limited to only the owner of the property from the client) wishes to rely on this report, they will need to enter a Third-Party Reliance Deed with PRM.

This report is limited to the observations made by PRM and information available and was limited to a desktop study only.

All results, conclusions and recommendations presented should be reviewed by a competent person before being used for any other purpose. PRM accepts no liability for use of, interpretation of or reliance upon this report by any person or body other than the client. Third parties must make their own independent inquiries.

This report should not be altered amended or abbreviated, issued in part or issued incomplete without prior checking and approval by PRM. PRM accepts no liability that may arise from the alteration, amendment, abbreviation or part-issue or incomplete issue of this report. To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by PRM and this report are expressly excluded (save as agreed otherwise with the client).

PRM shall bear no liability in relation to any change to site conditions after the date of this report. This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope and limitations defined herein (Scope of Works). Should information become available regarding conditions at the site including previously unknown sources of contamination, PRM reserves the right to review the report in the context of the additional information.

Appendix C2 (m) Waste Management Plan

PRM Waste Management Plan

PROGRESSIVE RISK MANAGEMENT

Waste Management Plan

URBNSURF Sydney Project

Corner Hill Road and Holker Busway, Sydney Olympic Park NSW

URBNSURF Sydney Pty Ltd

P034987.004

Version C | August 2021

Document Control

Project Details:	
Report Name:	Waste Management Plan
Client:	URBNSURF Sydney Pty Ltd
Project:	URBNSURF Sydney (USS)
Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Project Reference:	P034987.004 / C0332

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Report Version / Revision:		Version C			
Prepared by:		**Technical Review by:**		**Authorised for Issue by:**	
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	Senior Consultant				
	XX August 2021				

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Appendix A – Waste Register

1. Introduction

Progressive Risk Management Pty Ltd (PRM) were engaged by URBNSURF Sydney Pty Ltd (URBNSURF) to prepare a Waste Management Plan (WMP) for the URBNSURF Sydney (USS) Project located at the Pod B P5 Carpark, Hill Road, Sydney Olympic Park NSW (the site).

1.1. Background

URBNSURF Sydney will be a world-class sport, recreation, leisure, tourism and event facility orientated around a surfing lagoon sited at Pod B P5 Carpark, Hill Road, Sydney Olympic Park.

The project is State Significant Development with development consent conditions granted by Minister of Planning (ref: SSD 7942, dated 20 December 2017). Prior to commencement, condition C2(m) of the development consent requires a WMP to be included within the construction environmental management plan, which shall be prepared and implemented. The condition has been applied to ensure any waste generated as a result of development activities are minimised and managed in accordance with the applicable legislation, regulations and waste hierarchy.

1.2. Objective

The objective of the WMP is to detail the procedures and control measures to be implemented during construction in accordance with the regulatory framework and applicable development consent conditions. The WMP informs the Construction Environmental Management Plan to be prepared and implemented for the site.

1.3. Regulatory Framework

The following legislation, regulations and industry guidance has been considered in the preparation of this report:

- NSW Government: Protection of the Environment Operations Act, 1997)
- NSW Government Protection of the Environment Operations (General) Regulation (2009) and the POEO.
- NSW Government: Waste Avoidance and Resource Recovery Act (2001)
- NSW Government: Contaminated Land Management Act (1997).
- NSW EPA Waste Avoidance and Resource Recovery Strategy (2014 – 2021)
- NSW EPA Waste Classification Guidelines (2014).
- The Acid Sulfate Soil Management Advisory Committee (ASSMAC) Acid Sulfate Soils Assessment Guidelines 1998 (known as the "Acid Sulfate Soils Manual").
- Queensland Acid Sulfate Soil Technical Manual (2014)

1.4. Development Consent Conditions

Specific to the project, the WMP has been prepared in accordance with the requirements outlined in the development consent. An evaluation of the WMP compared to the development consent conditions is provided in **Table 1** below.

Table 1: Development Consent Condition Requirements

Requirement	Response
Condition C2(m) - Waste Management Plan to detail how waste (including contaminated waste and potential acid sulfate soils) would be managed, classified, handled, reused and disposed of during construction.	**Compliant** This WMP has been developed to address each aspect of this condition.
Condition D21. All vehicles involved in the excavation and / or demolition process and departing from the property with materials, spoil or loose matter must have their loads fully covered before entering the public roadway.	**Compliant** Refer to **Section 4.**
Condition D29 - A waste classification of all material to be transported off the site for disposal is to be undertaken in accordance with the EPA's Waste Classification Guidelines 2009 [sic]. In that regard, all waste is to be disposed to a facility that can lawfully receive waste and all documentation including waste classification reports, receipts and weighbridge dockets for materials disposed offsite are to made available to SOPA if requested.	**Compliant** Refer to **Section 4.**

2. Site Information

2.1. Site Identification

A summary of site identification and surrounding is provided in **Table 2**.

Table 2: Site Identification	
Detail	**Information**
Site Address:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Lot Parcel:	Part Lot 71 in Deposited Plan 1191648
Site Area	3.2 hectare
Local Council:	City of Parramatta
Current Zoning:	RE1 Public Recreation Zone, under the State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009
Current Site Use	Pod B P5 Carpark
Proposed Future Use:	URBNSURF surf park (public recreation facility).
Surrounding Land Uses:	**North**: Millennium Parklands, the Newington Armory and a mixture of commercial and residential buildings. **South:** Haslams Creek, parklands, a conservation area and Sydney Olympic Park facilities (commercial buildings, stadiums and arenas). **East:** A carpark, recreational facilities (BMX track and archery centre) and wetland. **West:** A car park, vacant private land with some commercial operations beyond.

2.2. Environmental Setting

The environmental setting is summarised in **Table 3**.

Table 3: Environmental Setting	
Detail	**Information**
Soils and Geology:	The Department Industry, Resources and Energy, 1983, 1:100,000 Geological Series Sheet 9130 (Edition 1) indicates that the site comprises of man-made fill including dredged estuarine sand, demolition rubble, industrial and household waste. This material is underlain by silty to peaty quartz sand, silt and clay with ferruginous and humic cementation and common shell layers. The geology encountered during the ESI conducted by WSP (Reference: 2270060A-CLM-REP-001 RevB) comprised mixed fill material from beneath surface asphalt/concrete to the maximum depth of the investigation at 3 metres below ground level (mBGL). The most predominant fill material units observed were a brown gravelly sand and a brown gravelly clay. Fill material with anthropogenic inclusions was also observed in the northeast portion of the site.
Acid Sulfate Soils:	**NSW Planning Portal** A review of the City of Parramatta (Sydney Olympic Park) Local Environment Plan 2012 within the NSW Planning Portal indicated the site was in an area of "disturbed terrain" and did not prescribe any requirement for development consent (or controls) for carrying out work. However a Class 2 Area ~250 m west of site was noted. **SEPP (State Significant Precincts) 2005 (Amended 2017)** The Acid Sulfate Soil Map (SEPP_SSP_SOP_ASS_001_20170607) for Sydney Olympic Park documents the site is within an area of "disturbed terrain". The Sydney Olympic Park Acid Sulfate Soil Risk Map describes "disturbed terrain" as filled areas of low-lying swamps for urban development. Other disturbed terrain includes areas which have been mined or dredged or have undergone heavy ground disturbance through urban development or construction of dams or levees.

Table 3: Environmental Setting	
Detail	**Information**
	Soil investigations are required to assess these areas for acid sulfate potential. Additionally the following features in the vicinity of the site were noted: • Haslams Creek ~100 m south is classed as "high probability at or near the ground surface" area. • Nuwi Wetland ~200 m east is classed as "high probability within 1 m of the ground surface" area. **CSIRO ASRIS** A review of the CSIRO Atlas of Australian Acid Sulfate Soils indicated that the site is within an area of "low probability of occurrence" of acid sulfate soils. **Historical Image Review** A review of historical aerial images provided confirmed the USS Project is sited within a low lying coastal area with mangroves apparent on the banks of Wentworth Bay. The site and surrounding area have since been filled; however it is likely the estuarine deposits (PASS) remain in their natural condition. An acid sulfate soil assessment is pending at the time of this WMP being written. Acid sulfate soil controls handling, treatment and managing runoff is included within this WMP (refer to **section 6**).
Hydrogeology:	The nearby Newington and Bicentennial Park Wetlands (located approximately 30 m north of the site) are nationally significant, although based on the NSW Planning Portal the site is not considered to include wetlands. The site is surrounded by constructed drainage basins (Narawang Wetland to the north) and estuaries (Haslams Creek to the south) connecting to the tide-dominated Parramatta River (approximately 750 m east). Groundwater is likely to flow in an easterly direction towards Haslams Creek and Parramatta River.
Topography / Drainage:	Surface elevation across the site ranges from approximately 9 meters Australian Height Datum (mAHD) in the south to 5 mAHD in the north, with an approximate 3% grade. Surface water is expected to drain towards the stormwater drainage channels located in the centre and north-west of the site. Surface water and groundwater is anticipated to then flow east towards Haslams Creek approximately 150 m east of the site and the Parramatta River 750 m east of the site, which ultimately discharge into Wentworth and Homebush Bay.
Sensitive Receptors:	Sensitive environmental receptors are considered to include the environmental conservation area that surrounds the site and Haslams Creek and, Parramatta River.

3. Waste Management

The WMP has been developed with the consideration of the waste hierarchy as outlined by the NSW EPA (2014) and depicted in **Figure 1** below. Where possible, the Principal Contractor will manage waste generated onsite in general accordance with these principles.

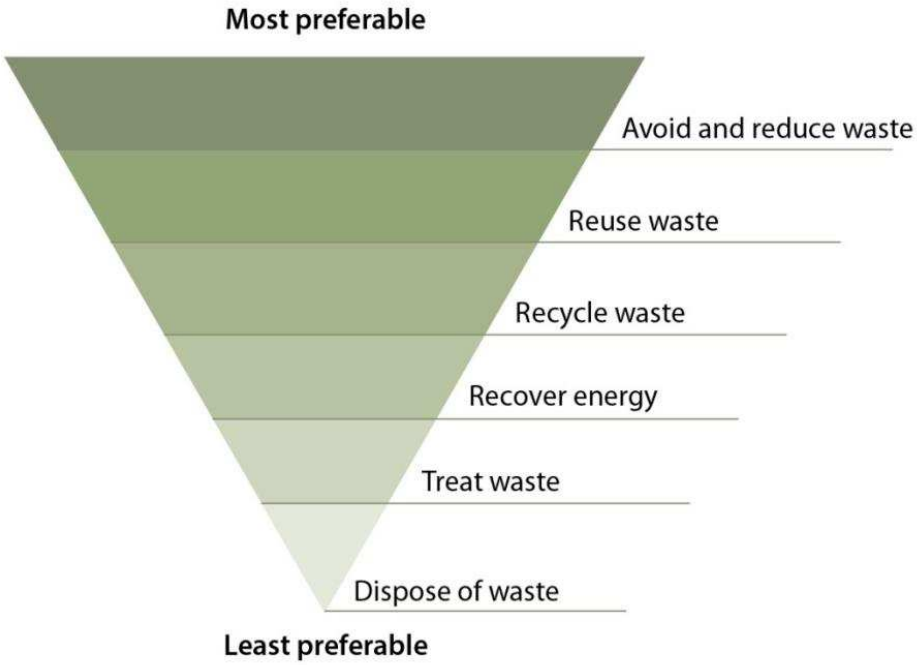


Figure 1 – Waste Hierarchy - Reference: NSW EPA Waste Avoidance and Resource Recovery Strategy (2014 – 2021).

3.1. Timeline of Events

The management of waste generated as part of construction activities will occur in the following sequence:

1) Pre-planning of construction activities will identify potential waste that is to be generated.
2) Waste streams will be identified for reuse onsite, recycling or for offsite disposal.
3) Provisions will be made onsite for the storage and handling of waste. This includes, but is not limited to material stockpiling areas, bin holding areas and areas nominated for the stockpiling of contaminated wastes. Refer to **Table 5** for the management of waste streams.
4) Waste handling areas will be clearly delineated and communicated to personnel onsite.
5) Waste streams should be kept separate where possible, preventing cross contamination.
6) Waste handling and management (stockpiling) will be undertaken in accordance with Section 3.1 of the CEMP, Section 5.5 of the Asbestos Management Plan, Section 4.2 of the Soil and Water Management Plan and approved Remediation Action Plan. Please also refer to Section 6 of this plan for Acid Sulfate Soil management.
7) Contaminated waste, such as asbestos waste, will be handled appropriately in accordance the Asbestos Management sub-plan and incorporated into the final design in accordance with the site Remediation Action Plan and CEMP.
8) Where required, waste will be classified for offsite disposal. Waste will be classified by the Environmental Consultant in accordance with NSW EPA Guidance with corresponding reports provided to the Principal Contractor.
9) The Principal Contractor will be responsible for tracking waste and maintaining corresponding records.

3.2. Roles and Responsibilities

Responsibilities for implementation of the various activities described in the WMP are summarised in **Table 4** below:

Table 4: WMP Roles and Responsibilities	
Role	**Responsibility**
Principal Contractor	• Implementation of WMP. • Induct all personnel including reference to WMP.
Principal Contractor and Subcontractors	• Managing waste resulting from construction activities. • Waste tracking and compliance including completion waste tracking register in **Appendix A**. • Tracking of asbestos waste using WasteLocate, see Asbestos Management Plan (ref: P034987.005) for further detail.
Environmental Consultant	• Waste classifications and reporting.

4. Waste Classification

Waste will be classified for offsite disposal to ensure waste materials are disposed of in accordance with the requirements of the NSW Protection of the Environment (Waste) Regulation 2014. Waste Classification will be undertaken by an Environmental Consultant based on previous analytical data, field observation, and if required, additional testing. Where additional testing is required to characterise the material, it will be conducted in accordance with the procedures described in the EPA-NSW Waste Classification Guidelines, Part 1: Classifying Waste (EPA 2014).

4.1. Waste Transport and Disposal

Waste producers are responsible under the legislation for ensuring that wastes are transported only after all the necessary documents and checks have been completed. Before transporting waste from the Site, the following must occur:

- Ensure the waste has been correctly characterised.
- Ensure the waste transporter is licensed or legally allowed to transport the waste.
- Ensure the waste is correctly loaded and covered.
- Ensure the transport contractor follows the correct procedures for entering and exiting the site so roadway cleanliness is maintained.
- Ensure the landfill facility accepting the waste is licensed to accept the class of waste being transported.
- All waste classification and weigh bridge dockets for disposal of surplus soils must be retained and are to be provided to SOPA on request.

4.2. Waste Tracking

All waste generated onsite should be appropriately tracked and recorded according to the Principal Contractors procedures. An example of Waste Register is included in **Appendix A**.

All Transport receipts/dockets shall be filed on site. Dockets must be issued by the Contractor receiving waste.

The Principal Contractor is responsible to ensure these records (including waste classification reports) are kept and available for review when requested by the client or Sydney Olympic Park Authority. They will also be retained at the end of the Project for archiving purposes, in accordance with legislation.

5. Waste Streams

The types of waste that may be generated as part of construction activities and the respective management and handling approaches are outlined in **Table 5** below.

Table 5: Waste types

Type	Management and Handling
General waste	Skip bins will be placed onsite in a designated area to receive general waste generated from site personnel. Disposal of material into the general waste skips should always be considered as the least preferred option. All surplus materials are to be considered for reuse, recycling or resale value, before being sent to landfill. Liquids are not to be put in general waste bins or skips. The Principal Contractor will ensure waste skips and bins are provided and that these bins and skips are emptied regularly (to prevent overflowing). Disposal shall be by a licensed contractor at an EPA licensed landfill facility.
Concrete, asphalt, and demolition waste	Concrete agitator trucks should return all concrete waste, including that from the agitator, to the local batching plant for treatment and re-use, if possible. A concrete chute wipe down facility should be established onsite. Concrete arising from demolition should be re-used on site where possible, or transferred to a resource recovery facility. Asphalt arising from demolition should be transferred to a resource recovery facility.
Concrete Washout	The following management measures should be considered to minimise the potential impacts of concrete washout areas on the environment: • The washout area should be located away from drainage lines, storm water drains and water bodies. • The concrete washout area should be conveniently located for washing out equipment and clearly signposted. • All wash down water is to be contained within the designated impervious bund. • Concrete washout areas are generally not designed for the collection of excess concrete. Excess concrete waste should be returned to the local batching plant for treatment and re-use or placed in a site receptacle designated for concrete and masonry and allowed to set. • To minimise the amount of washout water generated, excess concrete should be scraped off the equipment before it is washed and placed in a site receptacle designated for concrete and masonry. • A high pressure, low volume water spray nozzle reduces water use. • Concrete washout water must not be discharge from site. • Concrete water must be removed from site and disposed of at a liquid waste facility.
Soils	Soil resulting from bulk civil works will be incorporated into the final design, where possible. Should surplus soil be generated, it will be appropriately classified and will be re-used and/or disposed of offsite depending on classification.
Paper and cardboard	Recycling Bins shall be provided at site for all paper and cardboard. Paper and Cardboard recycling bins will be collected by a Recycling Service Provider. Paper and cardboard must be clean and free of contaminants such as oil, food and plastics.
Fuels and Oils	Any oil generated by servicing of major plant on site shall be recycled at a licensed oil recycling facility, arranged by the servicing contractor or the supplier of the plant. This oil shall not be stored on site and shall be removed immediately the servicing is complete. The servicing contractor or supplier must provide evidence of correct disposal of the oil on request.
Paint	It is preferable for substances to be completely used, leaving only a minute residue within the container. If no free liquid exists, containers may be stored undercover to dry and disposed of as General Waste.

Table 5: Waste types	
Type	**Management and Handling**
	If free liquid, the container must be sealed and disposed of at a licensed liquid waste facility.
Potential Acid Sulfate Soil and Acid Sulfate Soil	As described within the Environmental Setting in **Table 3**, there is a low risk of occurrence for Acid Sulfate soils and not within an area requiring development controls within the Strathfield LEP. Should PASS/ASS be encountered during construction works they will be managed , treated and re-used onsite where possible (refer to **Section 6** for details).
Asbestos Waste	Asbestos contaminated soil will be incorporated into the final design and capped. Refer to the site's Asbestos Management Plan (AMP) and Remediation Action Plan. Should asbestos waste need to be temporarily stockpiled, it will be appropriately covered and signposted as per the AMP. Any asbestos waste for offsite disposal will be appropriately classified and transported (by a licensed transporter) to a facility that is licenced to accept asbestos waste.
Metal	All metals shall be recycled. Bins will be provided at site for separation of metal for recycling and collection by a Metal Recycler.
Vegetation	Mulch and re-use of onsite where possible. If re-use is not possible, dispose of at a licensed disposal facility.
Septic Waste	If a connection to Sewage Facilities is not available for Construction Works, septic storage tanks will be used. Only use EPA licensed liquid waste transporters to empty septic tanks and ensure transported to a licensed facility. Empty as required.
Printer Cartridges	Stored (use container from new cartridge) and sent to cartridge recycler.
Spill prevention and response	Chemicals and other hazardous liquids should be stored in areas or containers with secondary containment measures. Secondary containment refers to any means used to contain liquids if the primary container (liquid storage container) or transfer mechanism fails, or spills/leaks from any other cause. Spill response materials are designed to absorb or direct the flow of liquids that have spilt onto land or into water. Spill response materials must be available, readily accessible, appropriate materials and sufficient to contain spills. Mobile liquid transfer points should be provided with suitable containment (bunding, drip trays), be fitted with shut-off valves to prevent overflow and provided with emergency shut-down devices.
Waste not listed in Table 5 or unknown waste.	The waste is NOT to be transported off the site until further advice is sought. The waste must be stored in a manner to avoid potential contaminants entering waterways and the possibility of migration offsite. If unknown wastes are encountered, the Principal Contractors Unexpected Finds Protocol is to be enacted.f the waste classification is not known, the Principal Contractor shall be advised and will arrange for the waste to be assessed in accordance with EPA guidelines. This will likely involve sending samples to a laboratory and/or seeking external assistance. The waste MUST be classified in accordance with the EPA's classification system to determine the correct handling, tracking, reporting and disposal requirements to be carried out.

5.2. Recycling

Recycling materials listed below are to be recycled at an offsite facility and shall not be disposed of as general waste.

- Ferrous and non-ferrous metals – Stored in bins at site and delivered to Metal Recycling facility.
- Paper and cardboard (office waste) – Office paper to Company Office for security disposal.
- Glass and plastic bottles and metal cans – Placed in bin provided at site.
- Concrete, asphalt and demolition waste – transported to resource recovery facility where possible.

Treated and untreated wood shall be reused at site where possible. Contaminated wood shall be disposed of to an appropriately licensed landfill. Unused wood shall be sent to a mulching facility.

6. Acid Sulfate Soils

General Description

Acid sulfate soils are natural sediments that contain iron sulfide, releasing acid when exposed to air. AASS can corrode building structures, kill plants and animals, and is a skin and eye irritant.

Potential impacts to soil and groundwater from ASS are generally associated with activities that have potential to lower the water table, such as dewatering or excavations below the water table, or exposing PASS to air in the vicinity of surface drains or sensitive receptors causing oxidation and a release of acid into the environment. This can result in the oxidation of PASS and acid generation. The generation of AASS can result in the release of sulfuric acid and iron into the soil and groundwater. This in turn can release aluminium, nutrients, and heavy metals (particularly arsenic) stored within the soil matrix. Once mobilised in this way, the acid, metals, and nutrients can seep into waterways, killing fish, other aquatic organisms and vegetation and can degrade concrete, steel pipes and structures to the point of failure.

Site Classification

The Acid Sulfate Soil Map (SEPP_SSP_SOP_ASS_001_20170607) for Sydney Olympic Park documents the site is within an area of "disturbed terrain". The Sydney Olympic Park Acid Sulfate Soil Risk Map describes "disturbed terrain" as filled areas of low-lying swamps for urban development. Other disturbed terrain includes areas which have been mined or dredged or have undergone heavy ground disturbance through urban development or construction of dams or levees. Soil investigations are required to assess these areas for acid sulfate potential.

A review of historical aerial images provided confirmed the USS Project is sited within a low lying coastal area with mangroves apparent on the banks of Wentworth Bay. The site and surrounding area have since been filled; however it is likely the estuarine deposits (PASS) remain in their natural condition.

Proposed Assessment

An acid sulfate soil assessment is pending at the time of this WMP being written. An acid sulfate soil assessment of deep (>5m) estuarine deposits to inform the liming rate is required prior to piling works to establish the liming rate required to neutralise PASS prior to reuse or disposal.

6.1. Management Principles

Management principles relating to PASS are provided in **Table 6** below.

Table 6: Acid Sulfate Soil Management Principles

Item	Requirement	Actions
Assessment of Acid Sulfate Soils.	Publicly available information presented inconsistent information. As a result, investigation of ASS has not been completed. Further review of ASS planning maps has confirmed investigation is required.	**Prior to Piling Works** An acid sulfate soil investigation targeting natural estuarine deposits below 1 mAHD should be undertaken to inform neutralising (liming rate) requirements of PASS arising from piling works. The scope of the ASS assessment includes: • Sampling density of 10 locations for a 3.2 Ha site. • Soil samples screened using pH_{FIELD} and pH_{FOX} analysis by a NATA accredited laboratory. • Selected samples to assess sulfur trail (% S), total potential acidity, total sulfuric acidity and liming rates as required.

Table 6: Acid Sulfate Soil Management Principles		
Item	**Requirement**	**Actions**
Spoil Management	Prevent oxidation of PASS arising from piling works, prevent leachate runoff and prevent mixing of PASS with non-impacted soil.	PASS arising from piling works will be treated (neutralised) in accordance with the acid sulfate soil manual. Soil will be placed into an appropriately bunded treatment area and treated with a neutralising agent (agricultural lime). Leachate from the PASS material will be captured disposed as per the GLMP to ensure no acid is released to the environment. Please refer to Section 6.4 below for disposal and re-use options.
Dewatering	Prevent lowering of the watertable and oxidation of PASS underlying the site.	The proposed work does not require lowering of the watertable (in any capacity).
Monitoring Requirements	Air monitoring for hydrogen sulfide is warranted during treatment of PASS. Soil sampling to confirm neutralisation of PASS and suitability for reuse onsite.	Environmental Consultant to undertake air monitoring of H2S within the work area. Environmental Consultant to undertake validation soil sampling to confirm PASS has been neutralised (pH>5.5). Daily inspection of piling spoil for visual or olfactory indications of PASS (e.g. rotten egg odour, discoloured runoff or the formation of jarosite / iron oxide).

6.2. Roles and Responsibilities

Responsibilities for implementation of ASS controls are summarised in **Table 7** below.

Table 7: ASS Roles and Responsibilities	
Role	**Responsibility**
URBNSURF	• Engagement of suitably experienced contractors in the management and control of ASS.
Principal Contractor	• Engagement of suitably experienced consultants and subcontractors in the management and control of PASS. • To undertake the works associated with piling, stockpiling, and treatment of PASS in accordance with this WMP and ensure compliance with work health and safety controls. • To maintain written records of activities undertaken each day and manage and report any unexpected finds. • Toolbox meetings to be conducted with all workers and subcontractors which will include informing all workers of the additional management requirement to minimise both occupational health and safety and environmental risk from acid sulfate soils.
Environmental Consultant	• To perform any additional PASS sampling prior to piling works commencing. • To perform any visual inspections and environmental monitoring (such as groundwater and/or surface water) if required during works. • To monitor treatment of PASS including air monitoring and validation sampling.

6.3. Work Health and Safety Considerations

Prior to commencing work, the relevant workers should be informed of the additional management requirements to minimise both occupational health and safety and environmental risk from PASS.

It is best practice to avoid any human contact with potential and actual acid sulfate soil materials. If contact is unavoidable, care should be taken in handling soils and leachate as it may have a low pH. As well as the normal personal protective equipment (long sleeve shirt and pants), appropriate gloves (Neoprene or PVC) and protective eye wear should be worn.

In addition, the dangers associated with hydrogen sulfide gas are an important occupational health and safety consideration. This gas has a characteristic 'rotten egg' odour, which at even relatively low concentrations can, after exposure, inhibit the sense of smell. Hydrogen sulfide is heavier than air and so tends to settle in depressions and may reach toxic levels within excavations or confined spaces. Symptoms of toxicity may become noticeable at 20 ppm and lethal at 400−500 ppm.

Short term exposure limit (STEL): The STEL is a 15-minute time weighted average exposure limit which must not be exceeded at any time during an eight-hour working day, even if the exposure during the full day is less than the TWA exposure standard. Exposures at the STEL must not be longer than 15 minutes and must not be repeated more than four times per day. There must be at least 60 minutes between successive exposures at the STEL.

The *Safe Work Australia, Work Exposure Standards for Airborne Contaminants (December 2019) guideline* prescribes a STEL criterion for hydrogen sulfide of 15 ppm.

6.4. Treatment, Disposal and Reuse Onsite

Site conditions allow for the onsite treatment of PASS and treatment can be mixed though the stockpile using an excavator. Following treatment and pH validation, treated material:

- Can be disposed offsite to a licenced facility that accepts that waste, OR
- Reused onsite as backfill. This includes being incorporated into landscape designs, as specified by final civil design.

For offsite disposal, the waste would have to be sampled, analysed, and compared to criteria as per the NSW EPA Waste Classification Guidelines (2014). Treated PASS to be reused onsite as backfill, or bund material, would require sampling, analysis, and comparison to the NEPM (2013) human and ecological criteria for the applicable land use.

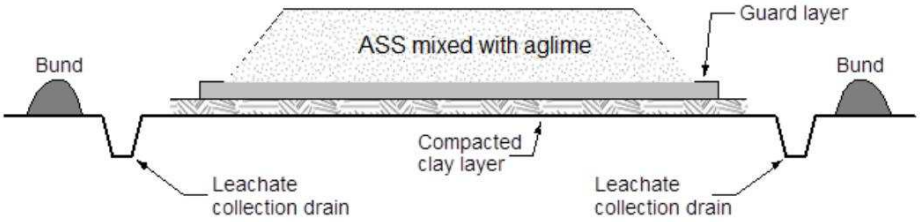
6.5. Temporary Storage of PASS

The project should be scheduled to minimise the time PASS material is exposed to air. This involves scheduling the works so PASS can be temporarily stockpiled and treated as soon as possible. The residence time for short term stockpiling of untreated PASS should not exceed the recommended period of 48 hours (2 nights) as detailed in the Queensland Acid Sulfate Soil Manual (2014) for sandy loams to light clays. Where possible, stockpiled PASS should be wet down periodically, to prevent oxidisation and acid formation. The stockpiling and treatment area should be:

- Constructed as far as practicable from any stormwater drain and sensitive receptors.
- Designed and sized to accommodate the anticipated volumes of excavated soil produced. Quantities should be kept to manageable proportions in suitably sized stockpiles.
- Barricaded with appropriate signage erected.
- Bunded to a height of approximately 0.3 m and appropriate sediment controls installed to prevent runoff and sediment migration.

6.6. Soil Treatment Procedure

PASS material may be played in layers up to 300 mm thick and incorporated with agricultural lime (*CaCO3/tonne liming rate to be confirmed by ASS assessment*) of using an excavator. Schematic of a typical treatment pad (QLD Acid Sulfate Soil Manual 2014) is provided below.



Following treatment, the appointed environmental consultant for the project should attend site for collection of validation samples and screening using a field pH meter to confirm the soil has been neutralised.

Bund material can include imported materials, or suitable soils excavated from the site that have undergone testing to indicate they are free of contamination. This includes previously treated PASS and clayey fill material originating from the site.

7. Response Procedures

7.1. Complaint Response

All complaints received in relation to waste management will be responded to in accordance with the Stakeholder Communication and Consultation Procedure. This provides details on how to receive, handle, respond to and record and action any stakeholder or community complaints.

Upon receipt of a complaint from stakeholders or community, preliminary investigations will be undertaken as soon as practicable to determine the likely causes of the complaint using information such as waste tracking and waste classification reports. A response will be provided as soon as practicable, which may include the provision of relevant data.

7.2. Complaints Register

All community complaints must be recorded on a complaint register and the HSEQ manager must be notified of all complaints received.

8. Limitations

This report is confidential and has been prepared by Progressive Risk Management (PRM) for URBNSURF Sydney Pty Ltd (the client) in accordance with the terms and conditions provided within the Consultancy Agreement between the client and PRM. This report may only be used and relied upon by the client and must not be copied to, used by or relied upon by any person other than the client. If a third party (limited to only the owner of the property from the client) wishes to rely on this report, they will need to enter a Third-Party Reliance Deed with PRM.

This report is limited to the observations made by PRM and information available and was limited to a desktop study only.

All results, conclusions and recommendations presented should be reviewed by a competent person before being used for any other purpose. PRM accepts no liability for use of, interpretation of or reliance upon this report by any person or body other than the client. Third parties must make their own independent inquiries.

This report should not be altered amended or abbreviated, issued in part or issued incomplete without prior checking and approval by PRM. PRM accepts no liability that may arise from the alteration, amendment, abbreviation or part-issue or incomplete issue of this report. To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by PRM and this report are expressly excluded (save as agreed otherwise with the client).

PRM shall bear no liability in relation to any change to site conditions after the date of this report. This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope and limitations defined herein (Scope of Works). Should information become available regarding conditions at the site including previously unknown sources of contamination, PRM reserves the right to review the report in the context of the additional information.

Appendix A – Waste Register

Waste Tracking Register							
Contractor Waste Generator	**Material Type and Origin**	**Classification**	**Quantity**	**Tick appropriate box**			**Disposal/Reuse/Recycling Location**
				Disposed	**Reused**	**Recycled**	
Subcontractor name	Soil, concrete, timber, etc.	Pre-classified recoverable, GSW, special waste, etc.	### tonnes	☑	☑	☑	Details, facility, date, receipt references, etc.

Appendix C2 (n) Asbestos Management Plan

PRM asbestos Management Plan

PROGRESSIVE RISK MANAGEMENT

Asbestos Management Plan

URBNSURF Sydney | Sydney Olympic Park
Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
URBNSURF Sydney Pty Ltd (NSW)
P034987.005
Version C | August 2021

Document Control

Project Details:	
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Project:	URBNSURF Sydney (USS)
Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
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	Luke Trevena				
	Senior Consultant				
	XX August 2021				

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Appendix A – Unexpected Finds Register

1. Introduction

Progressive Risk Management Pty Ltd (PRM) were engaged by URBNSURF Sydney Pty Ltd (URBNSURF) to prepare an Asbestos Management Plan (AMP) for the URBNSURF Sydney (USS) Project located at the Pod B P5 Carpark, Hill Road, Sydney Olympic Park NSW (the site).

1.1. Background

URBNSURF Sydney will be a world-class sport, recreation, leisure, tourism and event facility orientated around a surfing lagoon sited at Pod B P5 Carpark, Hill Road, Sydney Olympic Park.

The project is State Significant Development with development consent conditions granted by Minister of Planning (ref: SSD 7942 20 December 2017). Prior to commencement, Condition C7 of the development consent for the project requires an AMP to be included within the construction environmental management plan, which shall be prepared, approved by the Sydney Olympic Park Authority's Director and implemented throughout civil works. The condition has been applied to manage the risk associated with asbestos in soil at the site.

1.2. Objective

The objective of the AMP is to minimise the exposure to the potential airborne respirable asbestos fibres for site personnel and the public through the development and implementation of:

- An unexpected finds protocol to identify asbestos impacted soils or ACMs uncovered during earthworks at the site.
- Procedures to assess and manage asbestos impacted soils or ACMs identified at the site.
- Provision of asbestos awareness training to site personnel.
- Ongoing review of site conditions and ACM findings to ensure procedures and controls remain adequate throughout the project.

The AMP has been developed in accordance with the relevant regulatory framework as detailed in the following section and the applicable development consent conditions. The AMP relates to the site under development only.

1.3. Regulatory Framework

The following legislation, regulations, codes of practice and industry guidance has been considered in the preparation of this report:

- NSW Government: *Work Health and Safety Act 2011.*
- NSW Government: Chapter 8 Asbestos of the *Work Health and Safety Regulation 2017*.
- SafeWork NSW CoP: *How to Manage and Control Asbestos in the Workplace 2019*.
- SafeWork NSW CoP: *How to Safely Remove Asbestos 2019*.
- NSW Government: *Managing asbestos in or on soil 2014.*
- NSW Government: *Protection of the Environment Operations (Waste) Regulation 2014.*
- Western Australia Department of Health: Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009.

2. Development Consent Conditions

Specific to the project, the AMP has been prepared with consideration to the minimum requirements outlined in Condition C7 of the development consent as well as all relevant regulatory framework. An evaluation of the AMP compared to the development consent requirements is provided in **Table 1** on the following page.

Table 1: Development Consent Condition Requirements

Requirement	Response
Condition C7 - Prior to the commencement of works, the Applicant shall prepare and implement an Asbestos Management Plan to detail procedures should asbestos be detected on the site. The Plan must be approved by SOPA's Director, Environment and Planning, prior to the commencement of works. The Plan must be implemented for the duration of works. The Plan must: a) Incorporate all requirements for asbestos management outlined in the CEMP in Attachment 4 of the RTS and the RAP in Attachment 3 of the RTS. b) Be consistent with all requirements of SafeWork Australia's codes of practice 'How to Safely Remove Asbestos 2011' [sic] and 'How to Manage and Control Asbestos in the Workplace 2011' [sic]. c) Be consistent with all requirements of WorkCover NSW's 'Managing asbestos in or on soil 2014. d) Identify any known or potential areas of concern on site for asbestos containing materials. e) Outline the procedures for identification, handling, disposal and/or re-use of asbestos containing materials. f) Ensure that all asbestos would be handled and/or disposed of by a suitably licensed asbestos removalist in accordance with the relevant guidelines and legislation. g) Ensure an induction process is in place for site workers and visitors regarding the identification of asbestos and the formal procedures to be followed in the event that asbestos is identified on site. h) Include measures to ensure workers on site wear personal protective equipment. i) Include a suitable airborne asbestos fibre monitoring program for all asbestos removal works areas. j) Outline the procedures for soil validation and inspection following the completion of asbestos removal works and issuing of asbestos clearance certificates. k) Ensure compliance with any notification requirements to SafeWork NSW concerning the handling and removal of any asbestos. I) Ensure satisfaction of the requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 'asbestos wastes'.	**Compliant** a) AMP has addressed the prescribed requirements. b) AMP developed in accordance with the Safework NSW CoPs 2019. Refer to **Section 5.2.** c) AMP developed in accordance with the Safework NSW: Managing asbestos in or on soil 2014. Refer to **Section 5.2.** d) Refer to **Section 5.1** and **Figure 1.** e) Refer to **Section 5.2.** and **5.9.** f) Refer to **Table 3, Section 5.2** and **5.3.** g) Refer to **Section 4.1.** and **Section 6.** h) Refer to **Section 5.9.** i) Refer to **Section 5.8.** j) Refer to **Section 7.** k) Refer to **Section 5.4.** l) Refer to **Section 8.**
Condition D6 - All works involving the removal, handling and/or disposal of asbestos must only be undertaken by a suitably qualified expert who holds a current Class A Asbestos Removal Licence from SafeWork NSW and removal must be carried out in accordance with Safe Work Australia's NOHSC: Code of Practice for the Safe Removal of Asbestos 2005 [sic] and the approved RAP (refer to Condition D3).	**Compliant** Refer to **Section 5.2.** and **5.3.**
Condition D7 - An asbestos clearance certificate (or certificates) prepared by a suitably licenced asbestos removalist [sic] shall be provided to the Department and the Principal Certifying Authority upon completion of all asbestos removal works. The Applicant shall ensure the asbestos removal works comply with the relevant requirements of the Work, Health and Safety Regulation 2011 [sic].	**Compliant** Noting an independent hygienist accredited as a SafeWork NSW Licensed Asbestos Assessor (not a removalist) must prepare the clearance certificate(s). Refer to **Section 5.3.** and **7.**
Condition D8 - All works involving the removal, handling and/or disposal of asbestos must be undertaken in accordance with the approved Asbestos Management Plan for the development (refer to Condition C7).	**Compliant** Refer to **Section 4.** and subsequent sections of the AMP

3. Site Information

A summary of site identification and surrounding is provided in **Table 2**.

Table 2: Site Identification	
Detail	**Information**
Site Address:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Lot Parcel:	Part Lot 71 in Deposited Plan 1191648
Site Area	3.2 hectare
Local Council:	City of Parramatta
Current Zoning:	RE1 Public Recreation Zone, under the State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009
Current Site Use	Pod B P5 Carpark
Proposed Future Use:	URBNSURF surf park (public recreation facility)
Surrounding Land Use	**North**: Millennium Parklands, the Newington Armory and a mixture of commercial and residential buildings. **South:** Haslams Creek, parklands, a conservation area and Sydney Olympic Park facilities (commercial buildings, stadiums and arenas). **East:** A carpark, recreational facilities (BMX track and archery centre) and a wetland area. **West:** A car park and vacant private land with some commercial operations.

4. Asbestos Management Prior to Works

The objective of this AMP is to provide clear guidance on the safe and appropriate actions required during earthwork activities which will or are likely to disturb soil that has been impacted by asbestos and ACM. All works involving the removal, handling and/or disposal of asbestos must be undertaken in accordance with this approved Asbestos Management Plan.

4.1. Roles and Responsibilities

Responsibilities for implementation of the various activities described in the AMP are summarised in **Table 3** below:

Table 3: AMP Roles and Responsibilities

Role	Responsibility
Person in control of business of Undertaking (URBNSURF)	• Engagement of suitably licensed. • Engage an independent SafeWork NSW Licensed Asbestos Assessor (LAA) to provide full time supervision of site compliance, air monitoring during removal works, and provision of clearance certificate(s) at conclusion of asbestos removal works.
Principal Contractor	• Hold the necessary Class A license for asbestos removal OR appoint a Class A asbestos removal subcontractor to govern the works. • Implementation and provision of the AMP to all site occupants, workers and contractors undertaking intrusive soil works. • Ensure all workers involved in intrusive works are adequately trained in asbestos awareness (as a minimum) and Class A asbestos removal training for workers coming in direct contact with fill. • Keep all records relating to this AMP. • Review and ensure all SWMS provided by contractors include potential for asbestos in soil. • Obtained SafeWork NSW approval (notice) of asbestos removal (or disturbance). • Notify SafeWork NSW of air monitoring results above action levels when required. • Provide a Class A asbestos removal supervisor to ensure the AMP, ARCP, RAP and Safework NSW license are adhered to. • Track asbestos waste (off-site disposal) using NSW EPA Waste Locate tracking system.
Asbestos Hygienist | SafeWork NSW Licensed Asbestos Assessor (PRM)	• LAA is present on site to ensure work plans comply with WHS legislation, undertake asbestos air-monitoring during removal works, undertake sampling works and clearance inspections where required. • Provide guidance on the methods used during removal activity.

4.2. Asbestos Awareness Training and Site Briefing

4.2.1. Site Personnel

The Principal Contractor shall ensure all employees and contractors working at the site are provided with Asbestos Awareness Training. Asbestos Awareness Training will be provided as part of the site induction programme. The induction programme should also outline the formal procedures to follow should ACM be identified on site.

4.2.2. Site Visitors

Visitors to the site are to be briefed on the presence of ACM at the site (where applicable). The Principal Contractor is to ensure all personnel working on the site are briefed on the known locations of ACM and are aware of the potential for additional ACM to be unearthed during excavation works.

4.2.3. Site Induction

The site induction should include the following topics:

- Purpose of the training
- Health risks of asbestos, with relation to soils.
- Types and of asbestos likely to be encountered during intrusive works (i.e., asbestos fibre bundles and fragments of non-friable cement sheeting). This includes the extent of expected impacted fill across the site.
- Roles and responsibilities of personnel under the AMP.
- Location of the AMP (accessible to site personnel).
- Location of SafeWork NSW notice of asbestos removal and air monitoring results e.g. displayed at the site entrance, amenities or sign in area.
- Safe work procedures to be followed during intrusive soil works with examples to prevent exposure.
- The correct use of PPE including respiratory protective equipment (RPE).
- How to implement control measures and safe work methods at the site to eliminate or minimise the risk or exposure to workers and building occupants.
- When further assessment is required (e.g. by a Safe Work NSW LAA).
- When licenced asbestos removal works are required.
- Air monitoring requirements and exposure standard for airborne asbestos.

The objective of the training is to create changes in behaviour and asbestos management through improved awareness of workers and contractors at the site. The purpose of the training is also to provide understanding to workers and contractors of the health implications with and of exposure to asbestos, the appropriate control measures and their responsibilities and legislative obligations. Records of the induction and training will be retained by the Principal Contractor.

4.3. Asbestos Terminology

There are multiple terms used to describe the forms of asbestos, depending on the context and which Act, Regulation or guideline is referred to. For this AMP, asbestos material will be primarily referred to as 'friable' (Class A), in accordance with the NSW WHS Act, NSW WHS Regulations and SafeWork NSW guidance.

NEPM 2013 also addresses asbestos from a land contamination perspective and provides terminology that is based on guidance developed by Western Australia Department of Health (WA DoH), 2009.

The relationship between differing terminologies is outlined below in **Table 4**.

Table 4 Comparison of Asbestos Terminologies

NSW Work Health and Safety Regulation 2017 / SafeWork NSW Terminology	NEPM 2013 / WA DoH 2009 Terminology
Non-friable asbestos	Bonded ACM (referred to as ACM in WA DoH 2009)
Friable asbestos (weathered, degraded, easily pulverised by hand)	Fibrous asbestos (FA)
	Asbestos fines (AF)

The WHS Regulation defines '*non-friable*' ACM as any material (other than friable asbestos material) that contains asbestos, including material containing asbestos fibres reinforced with a bonding compound. Non-friable asbestos can include cement or soil containing fragments of asbestos containing material. The fibres are usually well encapsulated within the matrix of the product and therefore not able to be rendered into respirable asbestos fibres unless released by high-speed machining processes.

In contrast to the WHS Regulation definition of non-friable material, the WA DoH, 2009 and subsequently NEPM, 2013, have stated that non-friable ACM is asbestos material in sound condition (although possibly broken or fragmented), and where the asbestos is bound in a

matrix such as cement or resin. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve.

The WHS Regulation defines 'friable' asbestos material as that which can be crumbled, pulverised, or reduced to powder by hand pressure when dry. Friable materials are more likely to liberate respirable fibres into the air and pose a higher risk to human health in comparison to non-friable materials. A friable asbestos material is referred to as fibrous asbestos under the WA DoH, 2009 terminology.

In contrast to the WHS Regulation definition of friable material, the WA DoH, 2009 and subsequently NEPM, 2013, have stated that any material less than 7x7mm including asbestos fines resulting from degraded, broken, damaged or weathered (bonded) ACM or fibrous asbestos (friable). This means that a non-friable material has the potential to be classified as asbestos fines and therefore is to be treated as a friable asbestos product.

4.4. Asbestos Characterisation

An environmental investigation undertaken by WSP during 2016 (Reference: 2270060A-CLM-REP-001) identified the presence of asbestos in soil assumed to be above %w/w health screening level criteria at 7 borehole locations at between 1-3 m depth. The asbestos was associated with historically uncontrolled fill (site-wide) and was in the form of small fragments of bonded asbestos sheeting, friable asbestos fibreboard and fibre bundles detected within the soil samples..

The subsequent WSP RAP (Reference: 2270089A-CLM-REP-RAP RevA) notes that asbestos (both bonded and friable) are randomly present in uncontrolled fill across the entire site. That is, all work in these areas will be conducted under Class-A asbestos removal controls until appropriate capping and/or re-occupation clearance certificate has been issued.

5. Asbestos Management During Earthworks

The following protocols shall be applied when working in areas of known or suspected ACM contamination, or asbestos impacted soils. Access to the asbestos work area should be restricted to trained/authorised workers. All Contractors working on the site should be vigilant during earthworks to ensure the prompt identification of potential ACM or asbestos impacted soils across the development site and stop works to inform the Principal Contractor and foreman. SOPA will undertake site inspections at the beginning of works and as required to ensure all controls detailed in this AMP are in place.

If suspected ACM or asbestos impacted soils are observed outside of an Asbestos Work Area, stop work immediately and prevent access to the area by unauthorized people and site personnel. Notify the site supervisor as per the Unexpected Finds Protocol in **Section 6**.

5.1. General Requirements for the Management and Removal of Asbestos

Asbestos must be managed is accordance with the applicable legislation, regulations, codes of practice and industry guidance. Specifically for this project, excavation works within the fill known to be impacted by asbestos must be conducted in accordance with the following:

- NSW Government Work Health and Safety Act 2011.
- NSW Government Chapter 8 Asbestos of the *Work Health and Safety Regulation 2017*.
- SafeWork NSW CoP: How to Manage and Control Asbestos in the Workplace 2019.
- SafeWork NSW CoP: How to Safely Remove Asbestos 2019.
- NSW Government: Managing asbestos in or on soil 2014.
- Western Australia Department of Health: Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia 2009. As referred to by NEPM 2013 guidance.

It is noted that clause 485 of the WHS Regulation 2017, requires a person conducting a business or undertaking that commissions the removal of asbestos must ensure that the asbestos removal work is carried out by a Class A licensed asbestos removal.

5.2. Asbestos Removal Control Plan

The Class A Licensed Asbestos Removalist (i.e. Principal Contractor working under the license of a Class A asbestos removal subcontractor) will be responsible for developing and implementing an Asbestos Removal Control Plan (ARCP) in accordance with SafeWork NSW CoP: *How to Safely Remove Asbestos 2019* and be applicable to all aspects of ACM removal and associated works undertaken at the site. The nominated asbestos supervisor will be responsible for the control of all work areas associated with asbestos removal and ensuring the ARCP is adhered to. A copy of the ARCP must be available or with the supervisor onsite.

5.3. SafeWork NSW Notification

The Class A Asbestos Removalist (Principal Contractor) will be responsible for notifying SafeWork NSW of the asbestos removal activities. This notification will be provided to URBNSURF and relevant stakeholders, including SOPA. A copy of the SafeWork NSW Notification must be displayed onsite.

The Principal Contractor will notify Safework and SOPA of exceedances of action levels detailed in Table 6.

5.4. Control of Earthworks Activities and Dust Management

The following information is provided as a guide to control dust during earthworks in areas of known or suspected asbestos impacted soil:

- An Asbestos Work Area (restricted area) is to be established.
- An Asbestos Removal Control Plan should detail the controls for the task being undertaken under asbestos removal conditions.
- The restricted Asbestos Work Area (proposed excavation/stockpile zones) should be demarcated with appropriate warning signs to prevent unauthorised access.
- Prior to the first removal of the sub surface, dampening with water of the proposed excavation area should occur.
- Prior to movement of stockpiled soils, dampening with water across the stockpile surface should occur.
- During soil movement, material should be monitored to ensure it is appropriately dampened to reduce the likelihood of dust generation. No overwetting of material will occur.
- If a dump/haulage truck is required to enter the restricted area, the wheels of the truck and the sides of the body should be washed down before the truck leaves the restricted area.
- During civil and piling activities in asbestos areas, all spoil, sediment and surface water will be captured at the source. Any water transferred to holding tanks will be filtered through appropriate filter cloths, with the filter cloths subsequently disposed of as asbestos waste. Further, any sediment controls in the immediate asbestos work area will be disposed of as asbestos waste. Please refer to section 4.6 and 4.7 of the Groundwater and Leachate management sub-plan and Section 4.1 of the Soil and Water Management sub-plan.

The excavation surface should be continually monitored and the surface wet down as drying occurs. This process should continue until the ACM or asbestos impacted soils excavation works in the Asbestos Work Area are completed, which relies on the following factors:

- Use of water fogging nozzle (not high-pressure hoses).
- Constant vigilance of trained operators/contractor.

Please refer to Section 3.4 of the CEMP for Air quality controls in-line with this section.

5.5. Stockpiling of Asbestos Impacted Soils

Asbestos impacted soils requiring temporary stockpiling on site shall be placed in a suitable location and shall be surrounded by flagging or other suitable material to clearly delineate their boundaries. The stockpiles of fill material shall be deemed an 'Asbestos Work Area' and are to have appropriate asbestos warning signs affixed to the boundaries to identify the material as asbestos containing. The stockpiling is temporary until it is consolidated on-site or disposed off-site.

Stockpiles shall be lightly conditioned by water spray or covered by geotextile or similar cover to prevent dust generation. The contractor shall ensure that the material is stockpiled with adequate batter angles to ensure stability.

Silt fences/barriers should be constructed around exposed excavation surfaces and un-bunded stockpile areas to minimise potential migration of sediment, primarily as surface run off, onto other parts of the site. The silt fences shall be inspected regularly by the appointed Contractor for damage and immediately after rain to ensure effective functioning. Further, stockpiles will be covered at the end of the day. This is in line with Section 3.1 of the CEMP and Section 4.2 of the Soil and Water Management sub-plan.

Applicable controls are also outlined in the Soil and Water Management Sub-plan (Reference PRM Report P034987.001).

5.6. Asbestos Exclusion Zone

Security of the site shall be the responsibility of the Principal Contractor. Security to the ACM excavation zone shall be maintained by use of appropriate barriers such as warning flagging. Barriers should be visually inspected daily by the Sub-contractor and maintained as necessary, to prevent access to the works area. Signs should be erected prior to excavation works to warn other site workers not to enter the excavation area and maintained for the duration of the works. Several standard signs should be provided (as per SafeWork NSW requirements) which indicate:

- Access by authorised personnel only.
- Asbestos Work Area.
- Deep Excavations.

These signs should be approximately 500mm (wide) by 300mm (deed) and attached to the fence at a minimum frequency of 1 per boundary.

As detailed in the Remediation Action Plan, fill material at the site is suspected to contain asbestos. These areas will be appropriately delineated dependant on the staging of civil works and as per the controls in this AMP and the ARCP. Further, areas where cap and contain works are being undertaken will be considered asbestos work zones and delineated appropriately until the installation of the marker layer.

5.7. Air Monitoring

The ACMs and asbestos impacted fill materials identified acorss the site to date are classified as both non-friable and friable. Due to the presence of friable asbestos and potential sensitive receptors in the Sydney Olympic Park precinct, asbestos fibre air monitoring will be conducted during all earthworks and piling works where site fill/soil is being disturbed. All air monitoring is to be carried out by a SafeWork NSW accredited Licensed Asbestos Assessor.

The following presents an overview of the recommended air monitoring programme for the remediation works:

- Asbestos fibre air monitoring will be conducted along the perimeter of the Asbestos Work Area and site boundaries. The number of monitoring locations will be dependent on the size of the Asbestos Work Area but a minimum of five (5) locations. Monitoring locations may change based on the nature of works at the discretion of the LAA. It will also include exposure monitoring on personnel as deemed necessary by the LAA. Further, sensitive receptors are to be included as control monitoring locations, such as the adjacent areas accessible by the public. A dedicated air monitoring location will be included at the adjacent bus stop.
- Sample collection and analysis should be conducted in accordance with the National Occupational Health and Safety Commission (NOHSC) "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust [NOHSC: 3003 (2005)] (MFM).
- Sampling should be done with portable asbestos air monitoring pumps fitted with a sampling cartridge housing the asbestos sampling filter.
- The samples will be analysed by a NATA Accredited laboratory and the results reported on NATA Endorsed Certificates of Analysis.
- The samples will be analysed by phase contrast microscopy (PCM) in accordance with the MFM.
- The sampling parameters will be set such that the detection limit of <0.01 fibres/ml is achieved.

PRM recommends that asbestos fibre air monitoring should be conducted throughout the duration of intrusive works to confirm the control measures implemented are satisfactory and the area is considered safe for reoccupation upon completion of the intrusive works.

By undertaking control monitoring and exposure monitoring on personnel, a risk-based assessment will be undertaken on the air monitoring data to determine the likelihood of airborne respirable asbestos fibres. This will enable Class-A controls to be evaluated after a 10-week period of construction.

Sample and analysis work will be conducted by a NATA-accredited laboratory. The results of asbestos air monitoring should be provided to the Site Owner following each workday and/ or included in relevant clearance certificates. Air monitoring results should be obtained within 24 hours of sample collection. While this precludes "real time" monitoring, inspections will be made during excavation and loading/unloading works and, if there is any visible dust, light water spays will be used to wet the work areas and prevent the release of airborne asbestos fibres.

The following table outlines trigger levels for airborne asbestos fibres to be adopted for the project, which have been adopted from the SafeWork NSW Code of Practice.

Table 6: Airborne Fibre Action Levels

Action Level	Responsibility	Control / Action
<0.01 fibres/mL	Asbestos Removalist	1. Continue with existing control measures.
≥0.01 fibres/mL and ≤0.02 fibres/mL	Competent Person / LAA	1. Notify Asbestos Removalist and URBNSURF of results as soon as practicable.
	Asbestos Hygienist / SafeWork NSW LAA Asbestos Removalist	2. Investigate potential cause for the exceedance. 3. Existing controls to be reviewed and new and/or improved controls to be implemented where applicable.
≥0.02 fibres/mL	Asbestos Hygienist / SafeWork NSW LAA	1. Notify Asbestos Removalist, URBNSURF and SOPA of results as soon as practicable.
	Asbestos Removalist	2. Stop work immediately. 3. Notify the regulator (SafeWork NSW) by phone or in writing with air monitoring result and that removal works have ceased.
	Asbestos Removalist	4. Erect signage and barricades around asbestos work area to restrict access.
	Asbestos Hygienist / SafeWork NSW LAA Asbestos Removalist	5. Investigate the cause for the exceedance. This is to be performed by thorough visual inspection of the work area and equipment in consultation with workers. 6. Once suspected cause is identified existing controls to be reviewed and new and/or improved controls to be implemented.
	Competent Person / LAA	7. Conduct additional air monitoring around the asbestos work area once new controls have been implemented. 8. Works must not recommence until air monitoring results are <0.01 fibres/mL.

Air monitoring is required until all soil/fill affected by asbestos is adequately capped or encapsulated (e.g. underneath a geofabric layer). The Principal Contractor will notify Safework and SOPA of exceedances.

5.8. PPE and Personal Decontamination

Where personnel are required to work on the ground within the designated Asbestos Work Areas and are required to handle, or are likely to come into direct contact with asbestos

material, the following PPE is specified as a minimum requirement:

- Safety boots with rubber soles (to permit easy cleaning).
- Disposable Type 5/6 Tyvek® coveralls, or equivalent. Orange disposable overalls are recommended when working in close proximity to excavators.
- Suitable respiratory protection, i.e. minimum P1 half face respirators.
- Safety glasses (or goggles) and hard hart.
- Gloves.

These requirements do not apply for:

- equipment operators (excavators, tippers, etc.) who remain inside the equipment cabins whilst inside the Asbestos Work Area with windows closed and air conditioning system on recycle. Operators are to enter/exit equipment cabins from clean areas (i.e. outside of the Asbestos Work Area).
- personnel not inside an Asbestos Work Area.

It is the requirement of each sub-contractor to provide fit-testing records for the respiratory protection that is to be worn.

A decontamination area for personnel will be established at the entrance/exit to each Asbestos Work Area for the use of the personnel conducting the asbestos related works. The decontamination area will comprise a segregated area where the contaminated work clothing and respirators are removed and discarded. Contaminated PPE is to be disposed of in appropriately labelled and lined (with 200µm HDPE) waste bins or bags.

The abovementioned PPE is required for all personnel entering the Asbestos Work Area. Decontamination procedures are required every time personnel leave the work area. Safety boots are to be inspected for any potential ACM debris prior to removing the respirator and exiting the decontamination area.

The decontamination area must not be used for purposes other than decontamination (e.g. as a materials storage area). Personnel will remove disposable protective clothing prior and will be required to ensure that no asbestos soiled clothes or PPE leave the decontamination area. The Asbestos Removal Control Plan will include and reinforce the items detailed in this section.

5.9. Decontamination of Plant and Equipment

Excavators (fitted with HEPA filters) and truck windows are to be closed and air conditioning systems set to recycle (not fresh air intake) during all activities inside an Asbestos Work Area.

Trucks, plant and equipment leaving the Asbestos Work Area must be decontaminated (wheels, tracks, undercarriage, etc.) to ensure asbestos impacted soils are not tracked offsite.

The wheels and the sides of the body of the dump truck/haulage truck and excavator should be washed down before the truck leaves the restricted area.

It is recommended a clearance inspection is conducted by a SafeWork NSW LAA on plant and equipment once ACM removal work is complete. This will prevent cross-contamination and personnel potentially coming into contact with asbestos impacted soil.

6. Unexpected Finds Protocol

As previously mentioned, all fill materials at the site are to be considered impacted by asbestos. The RAP (WSP 2017) concluded "asbestos (both cement bonded and friable) are randomly present in fill material across the entire site". This means findings of the site contamination assessments (Reference: WSP Report 2270060A-CLM-REP-001) are indicative only and arein relation to the identified asbestos and secondary anthropogenic material.

. This Unexpected finds protocol sets out the procedure for high concentrations of asbestos (those that require increased controls eg. Friable loose fill asbestos) and asbestos encountered in material previously assumed to be free from ACM contamination (eg. topsoil stockpiles).

The purpose of the unexpected finds protocol is to define the trigger points and outline the procedures to be implemented in the event that suspected asbestos impacted soils are encountered The unexpected finds protocol for ACM is described below.

- During the earthworks, the machine operators or spotters shall monitor the excavation works and the materials excavated for evidence of building spoil, other indicators of anthropogenic input, and/or possible asbestos contamination. The following explains the procedure in the event of an Unexpected Find:
- If unknown building materials or materials suspected to contain asbestos (eg. At large concentrations) are exposed; or other indicators of potential asbestos contamination are observed, stop work immediately and notify the site supervisor and SOPA.
- Restrict access to the area using appropriate barricades, fencing, bollards, warning tape and signage.
- The site LAA/Occupational Hygienist visually assess the soils for asbestos content and advise appropriate controls. Testing will occur if the material is suspected of containing asbestos..
- Further assessment by the site LAA/Occupational Hygienist may be required to determine the lateral extent and depth of the asbestos impacted soils.
- If testing of the suspect material confirms that it contains asbestos, the area will be deemed an Asbestos Work Area. If the area is already an Asbestos Work Area, controls will be assessed and increased as necessary. The subject area will be isolated using barrier tape/mesh and signposted to indicate the presence of asbestos and that unauthorised entry is prohibited. There is no entry without appropriate precautions.
- Is the suspect material bonded or non-bonded (friable)? The site Occupational Hygienist or Licensed Asbestos Assessor will assess the ACM to determine whether it is classified as 'bonded' or 'non-bonded (friable)'.Friable materials are defined as those materials that can be crushed by hand pressure when dry. Friable materials include: pipe-lagging, asbestos millboard and woven insulating materials.

- Non-friable (bonded) materials are harder and less likely to release asbestos fibres if disturbed. Bonded materials include: asbestos cement sheet materials, vinyl asbestos floor tiles and other asbestos composites.

Construction works must stop and not recommence until SOPA has been informed of the unexpected find.The remediation scope will be determined by the LAA/Occupational Hygienist in consultation with the Principal Contractor and client.

All Unexpected Finds will be documented using the record sheet in **Appendix A**.

7. Clearance Inspection and Validation

Clearance inspections and associated validations will be required once ACM contaminated soil is removed and when the ACM contaminated soil is capped as part of the final design. The following steps detail what will occur as part of this process.

For removal areas subject of ACM removal:

- Once removal has occurred, the asbestos removalist will inform the Principal Contractor and LAA/Occupational Hygienist who will then conduct a visual inspection of the work area.
- The LAA/Occupational Hygienist will perform a visual inspection of the area.
- If ACM has been removed, an Asbestos Clearance Certificate is to be issued.
- If ACM is identified in the visual inspection, the LAA/Occupational Hygienist will inform the asbestos removalist and no Asbestos Clearance Certificate will be issued. Work will continue until the LAA/Occupational Hygienist is satisfied ACM has been satisfactorily removed.
- If the final level of excavation has been achieved and ACM is still evident, the LAA/Occupational Hygienist will advise the asbestos removalist to appropriately cap the area with geotextile fabric or similar to facilitate re-occupation of the area so that work can continue. The LAA/Occupational Hygienist will validate whether the cap has been installed appropriately.

For validation of areas where ACM is to be capped and contained:

- Once ACM contaminated material has been appropriately capped as per design requirements, the asbestos removalist will inform the Principal Contractor and LAA/Occupational Hygienist who will then conduct a visual inspection of the work area.
- The LAA/Occupational Hygienist will perform a visual inspection of the area.
- If the cap has been appropriately installed as per design requirements, the LAA/Occupational Hygienist will issue a Visual Inspection report detailing the findings and validating that the ACM material has been successfully capped. This includes inspecting the appropriate installation of the marker layer, capping thickness and ensure no ACM is identified.
- If the cap has not been satisfactorily installed the LAA/Occupational Hygienist will inform the asbestos removalist and no Visual Inspection report will be issued. Work will continue until the LAA/Occupational Hygienist is satisfied the cap has been installed appropriately.

The validation requirements align with the final civil and landscape design (cap and containment locations) and RAP.

8. Waste Management

8.1. Waste Classifications

Waste classification will be required for all soils to be disposed off-site to ensure waste materials are disposed of in accordance with the requirements of the NSW Protection of the Environment (Waste) Regulation 2014. Waste Classification will be undertaken by an Environmental Consultant based on previous analytical data, field observation, and if required, additional testing. Where required, additional testing is required to characterise the material, it will be conducted in accordance with the procedures described in the NSW EPA Waste Classification Guidelines Part 1: Classifying Waste, 2014.

The first preference is to consolidate asbestos waste onsite in nominated civil and landscape areas as per the remedial strategy in the Remediation Action Plan.

The Principal Contractor's Unexpected finds protocol applies for all unknown wastes

discovered during civil work.

8.2. Waste Transport and Disposal

The transportation and disposal of asbestos waste shall be in accordance with the EPA-NSW requirements. Before leaving the site, loads containing asbestos contaminated soils should be wetted down and covered.

Clause 79 of the Protection of the Environment Operations (Waste) Regulation 2014 requires waste transporters to provide information to the EPA regarding the movement of any load in NSW of more than 10 square meters of asbestos sheeting, or 100 kilograms of asbestos waste (i.e. asbestos in soil). To fulfil these legal obligations, asbestos waste transporters must use the EPA on-line system WasteLocate.

Waste producers are responsible under the legislation for ensuring that wastes are transported only after all the necessary documents and checks have been completed. Before transporting waste from the Site, the following must occur:

- Ensure the waste has been correctly characterised.
- Ensure the waste transporter is licensed or legally allowed to transport the waste.
- Ensure the landfill facility accepting the waste is licensed to accept asbestos waste.

9. Response Procedures

9.1. Operational Response Process

Where there is evidence of airborne pollutants arising from construction activities, the following will be undertaken:

- The project manager and site manager/supervisors will assess the source and extent of the exceedance.
- The Principal Contractor will undertake an investigation and assess the current controls being applied.
- If required, work will stop until the appropriate controls are put in place.
- Controls will be increased, as required.
- Any corrective action will be recorded in the site Safety Environment Quality (SEQ) folder database and reported to the Health Safety Environment Quality (HSEQ) Manager.

9.2. Complaint Response

All complaints received in relation to asbestos management will be responded to in accordance with the Stakeholder Communication and Consultation Procedure. This provides details on how to receive, handle, respond to and record and action any community complaints.

Upon receipt of a complaint from the community, preliminary investigations will be undertaken as soon as practicable to determine the likely causes of the complaint using information such as rainfall data, location of erosion or sediment and recent water quality monitoring results. A response will be provided as soon as practicable, which may include the provision of relevant monitoring data.

9.3. Complaints Register

All community complaints must be recorded on a complaint register and the HSEQ manager must be notified of all complaints received.

10. Limitations

This report is confidential and has been prepared by Progressive Risk Management (PRM) for URBNSURF Sydney Pty Ltd (the client) in accordance with the terms and conditions provided within the Consultancy Agreement between the client and PRM. This report may only be used and relied upon by the client and must not be copied to, used by or relied upon by any person other than the client. If a third party (limited to only the owner of the property from the client) wishes to rely on this report, they will need to enter a Third-Party Reliance Deed with PRM.

This report is limited to the and information available and was limited to a desktop.

All results, conclusions and recommendations presented should be reviewed by a competent person before being used for any other purpose. PRM accepts no liability for use of, interpretation of or reliance upon this report by any person or body other than the client. Third parties must make their own independent inquiries.

This report should not be altered amended or abbreviated, issued in part or issued incomplete without prior checking and approval by PRM. PRM accepts no liability that may arise from the alteration, amendment, abbreviation or part-issue or incomplete issue of this report. To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by PRM and this report are expressly excluded (save as agreed otherwise with the client).

PRM shall bear no liability in relation to any change to site conditions after the date of this report. This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope and limitations defined herein (Scope of Works). Should information become available regarding conditions at the site including previously unknown sources of contamination, PRM reserves the right to review the report in the context of the additional information.

Figures

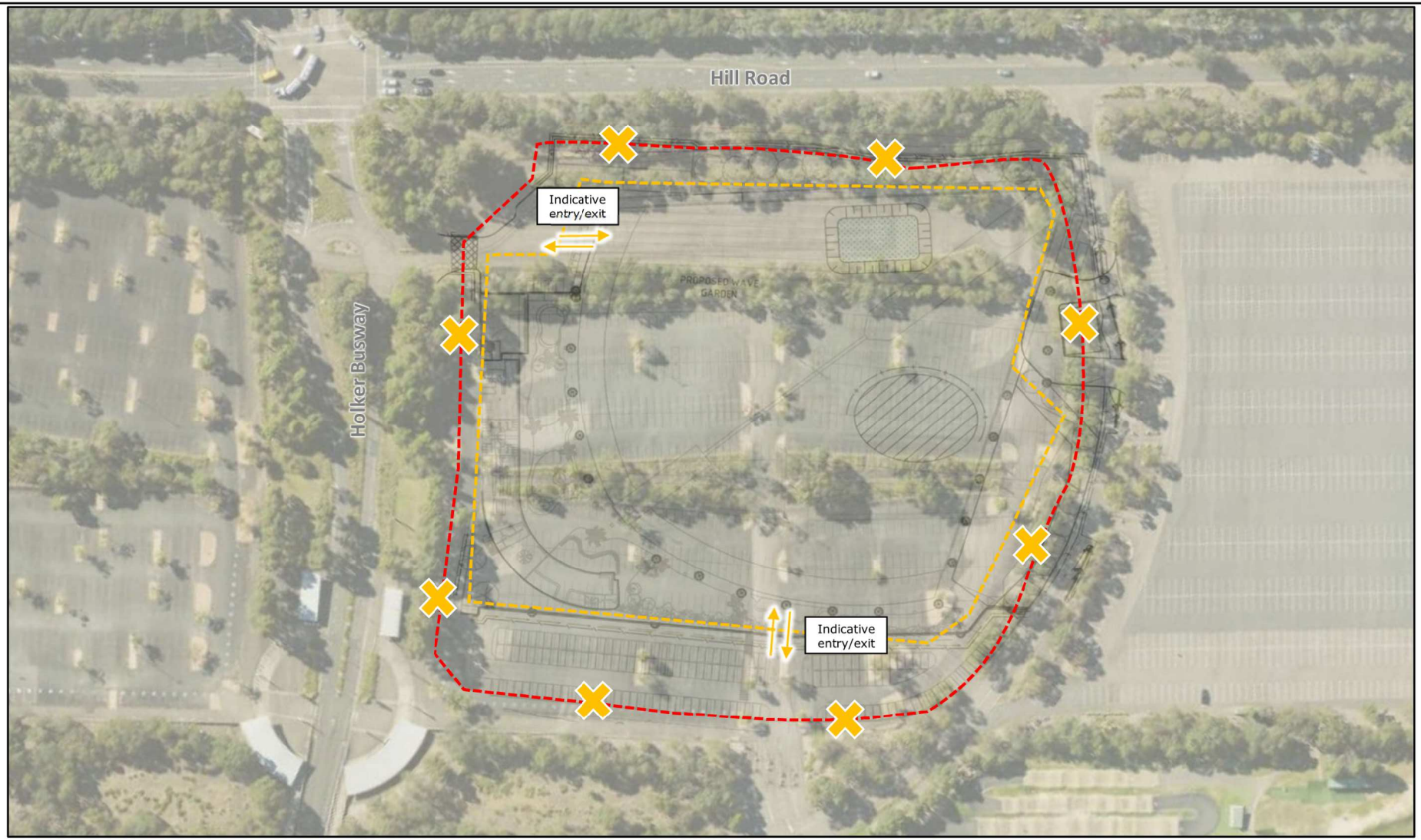

Image source: Metromaps.com (accessed 18 February 2021)

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PROGRESSIVE RISK MANAGEMENT

LEGEND					
	Approximate Site Boundary	Report Name:	Asbestos Management Plan		
	Indicative Excavation Area (Asbestos in Soil)	Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW		
X	Proposed Air Monitoring Location	Client Name:	URBNSURF Sydney Pty Ltd		
		Project Reference:	P034987.005		
		Figure Number:	1	Figure Name:	Site Layout

Appendix A – Unexpected Finds Register

Unexpected Finds Register		
Detail	**Record**	**Corrective Actions**
NAME: DATE: SIGNATURE:	• Describe the nature of unexpected find differing from anticipated site conditions. • Document the location and extent of unexpected find: • Has the unexpected find been adequately secured? **Y/N** • Have the relevant stakeholders been notified? **Y/N**	Description of control measures and rectification works completed.
NAME: DATE: SIGNATURE:	• Describe the nature of unexpected find differing from anticipated site conditions. • Document the location and extent of unexpected find: • Has the unexpected find been adequately secured? **Y/N** • Have the relevant stakeholders been notified? **Y/N**	Description of control measures and rectification works completed.
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NAME: DATE: SIGNATURE:	• Describe the nature of unexpected find differing from anticipated site conditions. • Document the location and extent of unexpected find: • Has the unexpected find been adequately secured? **Y/N** • Have the relevant stakeholders been notified? **Y/N**	Description of control measures and rectification works completed.

Appendix C2 (o) Unexpected Finds Protocol

Refer to Lipman Project Management Plan, (item) 2.8 HAZARDOUS SUBSTANCE & DANGEROUS GOODS, And Risk Assessment in Appendix 3

PROCEDURE

FOR

UNEXPECTED CONTAMINATION FINDS

13515 – UCF URBNSURF SYDNEY

DOCUMENT REVISION SUMMARY

Rev. No.	Rev. Date	Section Revised	Revision Description	Prepared By	Checked By	Approved By
1	29.07.21	ALL	Document Creation	F. Turnbull	R. Errington	S. Kaczmar

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1 PURPOSE AND SCOPE

This protocol details the actions to be taken when potential contaminated soils/materials are encountered during excavation/construction activities on the URBNSURF Sydney Project.

Even with early investigations unexpected finds may still occur during works. When this happens, this procedure must be followed. This procedure provides direction on when to stop work, where to seek technical advice, how to notify the regulator if required, and when works can recommence.

This procedure applies to the discovery of any unexpected soil contamination or asbestos where the find is not anticipated in any project specific document related to soil contamination.

This procedure must be followed by all staff, contractors, subcontractors, or any person undertaking works for the URBNSURF Sydney project. It includes reference to some of the relevant legislative and regulatory requirements but is not intended to replace them.

The Unexpected Contaminated Finds Procedure will form part of Ertech's Emergency Response Management Plan which will be implemented prior to commencement of works on site. All unexpected finds will also be treated as incidents and as such will be reported in line with the Ertech Incident Management Procedure.

2 INDUCTION AND TRAINING

Where required, personnel will be trained in the identification of potential contaminated soil/material including the requirements of this Protocol during the Project induction and/or regular toolbox talks.

Training will provide general awareness for recognition of potential contamination and hazardous materials, so that works can be suspended temporarily to allow evaluation by an appropriately qualified person. Project workers will be trained in identifying the following:

- Soil that appears to be contaminated based on visual and olfactory indicators.
- Asbestos (i.e. either bonded or friable).
- Groundwater or surface water that appears to be contaminated based on visual and olfactory observations (including potential hydrocarbon sheens on the water surface, free phase liquids such as petroleum fuel, discolouration etc.).
- Drums or USTs.
- Fill containing waste (e.g. ash, slag, refuse, demolition materials).

Contaminated land, ASS and/or asbestos is expected in some project areas (refer to CEMP and ASSMP). The Ertech Project Manager and/or Environmental Manager will be responsible for making the Site Supervisor aware of the nature of these prior to construction activities commencing in those areas.

3 SIGNS OF CONTAMINATION

An unexpected soil contamination or asbestos find is:

- Any unanticipated discovery of an actual or potential area of contamination which is likely to comprise of any buried material which is not a typical soil material i.e. fill, soil, rock
- A find that has not been previously identified or assessed
- Likely to be associated with poor waste disposal and / construction activities undertaken historically at the site

Construction personnel are to continuously monitor for the signs of contamination. Signs of contamination may include:

- Unusual odour (e.g., fuel, rotten egg, or sewerage smells)
- Change in colour (e.g., dark staining, yellow or other coloured material)
- Change in consistency (e.g., layers of ashy material)
- Foreign objectives (construction waste, asbestos, or military items)
- Oily sheen on collected rain or groundwater
- Ash or tar in soil
- Nearby drums or chemical containers
- Anything differed or unusual

4 LEGISLATIVE REQUIREMENTS

The following table identifies some of the relevant legislation / regulations for the management of contaminated materials on site.

Legislation	Key requirements
Contaminated Land Management Act 1997	The Act provides a regime for investigating and, where appropriate, remediating land affected by contamination, which represents a significant risk of harm to human health or the environment. Under this act EPA has the power to: • Declare an investigation site and order an investigation • Declare a remediation site and order remediation to take place • Agree to a voluntary proposal to investigate or remediate a site
Contaminated Land Management Regulation 2013	The regulations clarify, the recovery of administrative costs, accreditation of site auditors and penalty notices
Protection of the Environment Operations Act 1997	This Act provides for pollution events, scheduled activities and UPSS regulation. Creates rules/licences for protection of the public and environment during remediation
Environmental Planning and Assessment Act 1979	This Acts provides legislation for contaminated sites where remedial actions can wait for development control processes.
Waste Avoidance and Resource Recovery Act 2001	Establishes the waste hierarchy. Promotes waste avoidance and resource recovery by developing waste avoidance and resource recovery strategies
Water Management Act 2000	The objective of this Act is to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations

National Environment Protection (Assessment of Contaminated Sites Measure 1999 (Amended 2013)	Sets the national frameworks for the assessment of contaminated sites

5 UNEXPECTED CONTAMINATED FINDS PROCEDURE

If an unexpected find is encountered on site, the steps detailed below must be followed.

Step	Task	Responsibility
1	**STOP WORK**	
1.1	• Stop all work in the immediate area of the potential soil contamination or asbestos find • Notify the Project Manager	• Supervisor
1.2	• Establish a 'No-Go Zone' around the area • Use high visibility fencing where practical • No work is to be undertaken within this zone until further investigations are completed and, if require, appropriate approvals are obtained • Inform all site personnel about the 'No-Go Zone' • A suitable person must assess the potential risk to human health and the environment posed by the unexpected find and assess if evacuation or emergency services need to be contacted. • Conduct Health Surveillance and Exposure Monitoring in line with Ertech Procedure H-SYS-PRO-083 as required. Please see appendix 2 for the 'Health Surveillance and Monitoring Workflow'.	• Supervisor • Project Manager
2	**ENGAGE A CONTAMINATION / ASBESTOS SPECIALIST**	
2.1	• Engage the project Contamination or Asbestos specialist (depending on suspected material) • Provide as much information as possible on the potential soil contamination or asbestos find • Should a suspected gas / odour be detected, engage project contamination consultant to determine if LEL (Lower Explosive Limits monitor) monitoring is required • Inform the USG Environmental Manager that suspected soil contamination or asbestos has been discovered on site	• Environmental Manager • Supervisor
2.2	• Where there is no project Contamination or Asbestos Specialist engaged for the works, engage a suitably qualified consultant to assess the unexpected find	• Environment Manager
3	**ARRANGE SITE ACCESS**	

3.1	• Arrange site access for the Contamination / Asbestos Specialist to inspect the area of concern as soon as practicable. • In most cases a site inspection is required to conduct a preliminary assessment	• Supervisor • Environment Manager
4	**UNDERTAKE ASSESSMENT**	
4.1	• A Contamination / Asbestos Specialist should undertake an assessment to determine any further actions required e.g. sampling and / or validation of material, potential for remediation and / or management	• Contamination / Asbestos Specialist
4.2	• A Contamination / Asbestos Specialist to provide advice as follows: o Preliminary assessment of the find and need for immediate management controls (if any) o What further assessment and / or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and Guidelines o Preparation of a remedial action plan for large scale contamination or specification for smaller or minor volumes of material (if necessary) o Remediation works required (where applicable) o Validation works required following remediation works (if applicable) • Unexpected find will be investigated as an incident and therefore, said investigation will be carried out as appropriate in accordance with the Ertech 'Report and Investigate Incidents' Procedure (H-SYS-PRO-062).	• Contamination / Asbestos Specialist
4.3	• Air monitoring requirements are to be advised by an Environmental Consultant.	• Contamination / Asbestos Specialist
4.4	• If it is deemed safe to do so, the Contamination / Asbestos Specialist will provide clearance for works to proceed in the affected area. If it is not considered to be safe, works must remain on hold until appropriate assessment, remediation and / validation measures have been actioned	• Contamination / Asbestos Specialist
5	**IMPLEMENT THE APPROVED MANAGEMENT AND/OR REMEDIATION PLAN**	
5.1	• Works are not to recommence in the affected area until appropriate advice has been obtained from the Contamination / Asbestos Specialist and they have provided clearance. Excavation will not recommence until the extent of the contamination has been assessed and, if necessary, in accordance with the remedial action plan (RAP). • Management and or Remediation will be implemented in line with procedures in approved project management plans, e.g. Asbestos Management Plan.	• Contamination / Asbestos Specialist

5.2	• Excavated material from remedial activities will be separated from other materials and stockpiled for assessment. Sampling of the materials will be undertaken in accordance with the relevant guidelines. Sample will be analysed for a range of analytes as required for beneficial reuse or offsite disposal	
6	**RECORD OF CONTAMINATION**	
6.1	• A waste tracking system recording the volume of material, waste classification / beneficial reuse status, removal documentation and truck and receiving landfill facility details must be recorded to ensure all waste is accounted for and disposed of appropriately in accordance with NSW EPA requirements	• Supervisor • Environment Manager
6.2	• Any unexpected finds must be documented in the Unexpected Finds Register (see appendix 1), and records of volumes and types of materials identified removed from the site must be kept on file	• Supervisor • Environment Manager
6.3	• Keep a record including exact location / GPS coordinates of the find	• Supervisor • Environment Manager

If Unexpected Asbestos Containing Material is found on site, the procedure in the Asbestos Management Sub-Plan will be followed.

6 RESPONSIBILITIES

Role	Responsibility or role under this guidance
Contractor / Supervisor	• Stop work immediately when an unexpected soil contamination or asbestos find is encountered. Cordon off area until Environmental Manager advises that work can recommence • Manage the process of identifying and mitigating impacts • Liaise with USG Project Manager, Environment Manager and Contamination Specialist / Asbestos Specialist • Assist the Contamination Specialist / Asbestos Specialist with mitigation and regulatory requirements • Complete Incident Report and review CEMP for any changes required. Propose amendment to the CEMP if any changes are required
Project Manager	• Ensures all aspects of the procedure are implemented • Advise Contractor / Supervisor to recommence work if all applicable requirements have been satisfied and the Contamination Specialist / Asbestos Specialist has approved recommencement of work
Contamination Specialist / Asbestos Specialist	• Provide expert advice to the Environment Manager on find identification, testing, removal or treatment, legislative procedures and regulatory requirements

Environmental Representative	• Ensure compliance with relevant approvals (new and existing) • Approve any updates to the CEMP where required
Environment Manager	• Notify the SOPA & USG Environmental Manager of the find • Complete incident reporting with Supervisor • Review and update CEMP where required

7 REPORTING OF UNEXPECTED SOIL CONTAMINATION

Should unexpected contamination be discovered on site during construction works, the Environment Manager will report this to SOPA and the ER. Information to be reported will include the following:

- Observations of the material discovered
- Chemical analysis of the material
- Comparison of material (observations and chemical analysis) to known on site contamination
- Remediation plans

8 SEEKING ADVICE

Advice on this procedure should be sought from the Environmental Manager in the first instance. All contractors and sub-contractors should ensure their site personnel are aware of and understand this procedure prior to commencing construction.

Technical contamination and asbestos advice regarding an unexpected find should be sought from a suitably qualified and experienced contamination specialist / asbestos specialist.

9 EXAMPLE OF CONTAMINATION FINDS

Buried Wastes

Descriptions:

- Buried demolition wastes (e.g. concrete, tiles, bricks, asphalt, timber, metal, plastics)
- Buried domestic wastes (e.g. plastics, cardboard, paper, food, vegetation)
- Buried industrial wastes (e.g. chemical containers, ash/slag, paint, tar)
- Buried sanitary waste (e.g. collection can, glass, plastic, organic materials, tar)

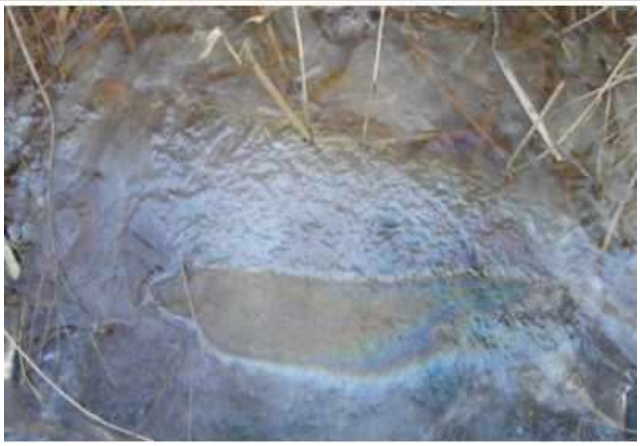
Buried Containers and Drums

Description:

- Metal or plastic drums, barrels and containers
- Chemicals may or may not be present within containers

Strong chemical odour in surrounding soils

Discoloured or Odorous Soils and Groundwater/Seepage



Description:

- Discoloured soil (soil with non-natural colouring). More likely to be present clos to surface or buried within fill material
- Acid sulfate soils (grey/black/green, sulphur odour, shell fragments)
- Pungent, petroleum, compost, putrefied, sulphorous, acidic, caustic, septic, sweet, aromatic odours
- Rainbow sheen on water surfaces

Underground Storage Tanks

Description:

- Likely to be located within or adjacent to historical and current refuelling facilities, mechanical and industrial operation
- More likely to contain fuel and waste oil products
- Metal or fibreglass construction
- Be aware of above ground evidence of tanks (i.e. pavement scarring, fill and dip points, bowser foundations, vent pipes on adjoining buildings)
- Hydrocarbon odours

Be aware of sand backfill and concrete anchors during excavation works

Bonded or 'Non-Friable' Asbestos

Description:

- Colour dependant on building material matrix, typically white-grey
- Fibrous edges or 'torn-cardboard' appearance on broken edges
- Fibre cement sheeting has dimpled surface
- Cannot be crushed or broken up with hand force
- Construction materials up to 15 years and older
- Fibre cement sheeting / cladding
- Vinyl products (floor tiles)
- Fibre cement corrugated roofing material
- Fibre cement guttering and pipework
- Electrical backing boards

Non-Bonded or 'Friable' Asbestos

Description:

- White, grey, blue or dirty fibrous material
- Fluffy
- Easily crush with finger pressure
- Insulation
- Weathered/damaged fibre cement sheeting
- Fibrous clumps of material

10 REFERENCES

10.1 REFERENCE TO INTERNAL COMPANY DOCUMENTS

Reference Documents	Document No.	Reference Documents	Document No.
Report and Investigate Incidents	H-SYS-PRO-062	Conduct Health Surveillance and Exposure Monitoring	H-SYS-PRO-083
Emergency Response Management Plan		Asbestos Management Plan	

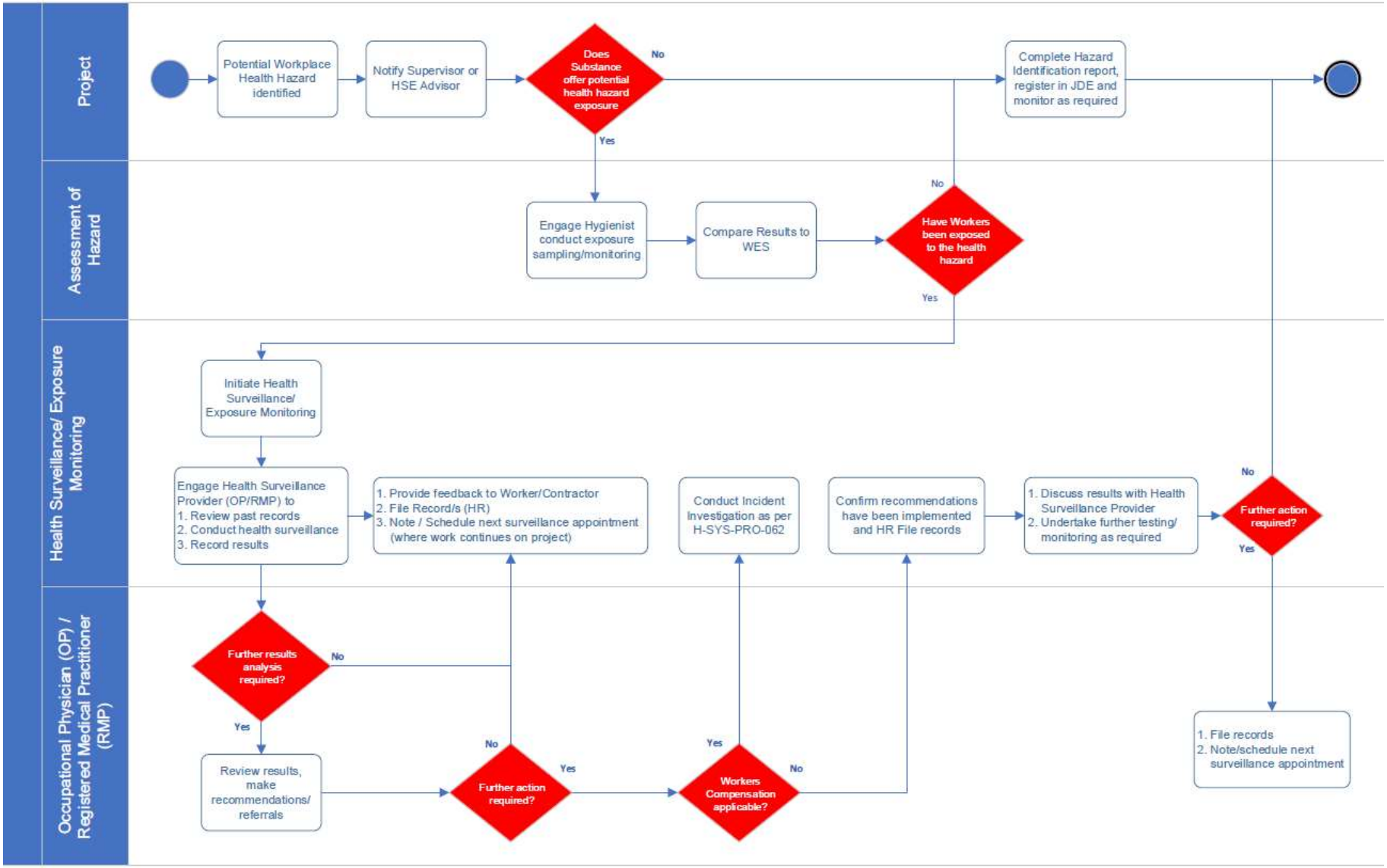
APPENDIX 1: UNEXPECTED FINDS REGISTER

FIND NO.	TIME & DATE	CONTRACTOR & WORKER NAME	LOCATION		ITEM FOUND	COMMENTS & OBSERVATIONS	WHO WAS NOTIFIED	OUTCOME
			EASTING	NORTHING				

Important Register Notes:

1. *All Unexpected Finds must be recorded in the register and the register must be kept on site by the Environmental Manager or nominated representative. The register must be kept on site until the end of construction activity and provided to USG or their representative for future reference as required*
2. *All Unexpected Finds must be reported to the Supervisor or Environmental Manager to ensure correct actions can be undertaken*
3. *Comments and observations should clearly document the suspect material type (i.e. asbestos, hydrocarbon stained soil, buried construction and demolitions wastes, buried drums with liquids), the estimated volume or extent, any odours and specific visual or olfactory observations*

APPENDIX 2: HEALTH SURVEILLANCE AND MONITORING WORKFLOW



Appendix C2 (p) Flora and Fauna Management Plan

PRM Flora And Fauna Management Plan

PROGRESSIVE RISK MANAGEMENT

Flora and Fauna Management Plan

URBNSURF Sydney Project
Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
URBNSURF Sydney Pty Ltd
P034987.006
Version C | August 2021

Document Control

Project Details:	
Report Name:	Flora and Fauna Management Plan
Client:	URBNSURF Sydney Pty Ltd
Project:	URBNSURF Sydney (USS)
Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Project Reference:	P034987.006 / C0332

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Prepared by:		**Technical Review by:**		**Authorised for Issue by:**	
	Luke Trevena				
	Senior Consultant				
	XX August 2021				

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1. Introduction

Progressive Risk Management Pty Ltd (PRM) were engaged by URBNSURF Sydney Pty Ltd (URBNSURF) to prepare a Flora and Fauna Management Plan (FFMP) for the URBNSURF Sydney (USS) Project located at the Pod B P5 Carpark, Hill Road, Sydney Olympic Park NSW (the site).

1.1. Background

URBNSURF Sydney will be a world-class sport, recreation, leisure, tourism and event facility orientated around a surfing lagoon sited at Pod B P5 Carpark, Hill Road, Sydney Olympic Park.

The project is State Significant Development with development consent conditions granted by Minister of Planning (ref: SSD 7942, dated 20 December 2017). Prior to commencement, condition C2(p) of the development consent requires a Flora and Fauna Management Plan to be included within the construction environmental management plan, which shall be prepared and implemented. The condition has been applied to protect the potential presence of fauna and habitat located around the site.

In consultation with the client, PRM has included provisions for the management of Flora present at the site based on the following considerations:

- Condition D14 of the development consent.
- Possible disturbance of flora immediately adjacent to the site.
- Possible disturbance to flora in the Nuwi Wetland to the east of the site during water discharge line construction.
- Prevent weed establishment (referred to as "weed incursion").
- Stormwater impacting the neighbouring wetland and saltmarsh communities.

1.2. Objective

The objective of the FFMP is to detail the control measures to be implemented during construction in accordance with the prevention and mitigation measures in accordance with:

- The Flora and Fauna Assessment prepared by Applied Ecology, 2017.
- Environmental Impact Statement prepared by SJB Planning (NSW) Pty Ltd, 2017.
- Applicable development consent conditions.

The FFMP must be fully integrated within the Construction Environmental Management Plan to be prepared and implemented for the site.

1.3. Regulatory Framework

The following legislation and guidance were considered in the preparation of this report:

- Australian Government: Environmental Protection and Biodiversity Conservation Act 1999 (The EPBC Act).
- NSW Government: Threatened Species Conservation Act 1995 (The TSC Act).
- Sydney Olympic Park Authority (SOPA), Environmental Guidelines, 2008.
- NSW Department of Environment and Climate Change best practice guideline Green and Golden Bell Frog Habitat, 2008.

1.4. Development Consent Conditions

Specific to the project, the FFMP has been prepared in accordance with the requirements outlined the development consent. An evaluation of the FFMP compared to the development consent conditions is provided in **Table 1** below.

Table 1: Development Consent Condition Requirements

Requirement	Response
Condition C2(p) - Fauna Management Plan which incorporates all relevant recommendations and mitigation measures outlined in the Flora and Fauna Assessment in Attachment 10 of the EIS, particularly in relation to the minimisation and management of potential impacts on fauna using swales on site and the Green and Golden Bell Frog.	**Compliant** Refer to **Section 3.**
Condition C8 - The Construction Environmental Management Plan (refer to condition C2) must incorporate suitable measures to: a) monitor for the presence of Green and Golden Bell Frogs on site during and immediately after high rainfall events; and b) prevent Green and Golden Bell Frogs form entering the site during construction by installing temporary frog exclusion fencing (such as sediment fencing) or similar, particularly during and immediately after high rainfall events and during mating season.	**Compliant** Refer to **Sections 3, 4, and 5.**
Condition D13 - During construction, a suitably licenced and experienced ecologist must be on site prior to and during the removal of the vegetated swales, for the purpose of locating and relocating fauna inhabiting these swales. Removal of the swales is not to occur on days when the maximum temperature is forecast to exceed 32 degrees Celsius, to avoid distress to fauna during searching and relocation. All release sites for salvaged fauna are to be approved by Sydney Olympic Park Authority.	**Compliant** Refer to **Section 3.**
Condition D14 - The Applicant shall ensure: a) no street trees are trimmed or removed unless it forms a part of this development consent or prior written approval from SOPA is obtained or is required in an emergency to avoid the loss of life or damage to property; b) all street trees not removed as part of this consent are protected at all times during construction. Any tree on the footpath, which is damaged or removed during construction due to an emergency, shall be replaced, to the satisfaction of SOPA; c) all trees on the site that are not approved for removal are to be suitably protected by way of tree guards, barriers or other measures, are to be provided to protect root system, trunk and branches, during construction; and d) tree removal works are undertaken by a qualified arborist recognised within the Australian Qualification Framework, with a minimum five years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works and in accordance with AS 4373:2007.	**Compliant** Refer to **Section 3.**

2. Site Information

2.1. Site Identification

A summary of site identification and surrounding is provided in **Table 2**.

Table 2: Site Identification	
Detail	**Information**
Site Address:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
Lot Parcel:	Part Lot 71 in Deposited Plan 1191648
Site Area	3.2 hectare
Local Council:	City of Parramatta
Current Zoning:	RE1 Public Recreation Zone, under the State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009
Current Site Use	Pod B P5 Carpark
Proposed Future Use:	URBNSURF surf park (public recreation facility)
Surrounding Land Use	**North**: Millennium Parklands, the Newington Armory and a mixture of commercial and residential buildings. **South:** Haslams Creek, parklands, a conservation area and Sydney Olympic Park facilities (commercial buildings, stadiums and arenas). **East:** A carpark, recreational facilities (BMX track and archery centre) and wetland. **West:** A car park, vacant private land with some commercial operations beyond.

2.2. Environmental Setting

The environmental setting is summarised in **Table 3**.

Table 3: Environmental Setting	
Detail	**Information**
Soils and Geology:	The Department Industry, Resources and Energy, 1983, 1:100,000 Geological Series Sheet 9130 (Edition 1) indicates that the site comprises of man-made fill including dredged estuarine sand, demolition rubble, industrial and household waste. This material is underlain by silty to peaty quartz sand, silt and clay with ferruginous and humic cementation and common shell layers. The geology encountered during the ESI conducted by WSP (Reference: 2270060A-CLM-REP-001 RevB) comprised mixed fill material from beneath surface asphalt/concrete to the maximum depth of the investigation at 3 metres below ground level (mBGL). The most predominant fill material units observed were a brown gravelly sand and a brown gravelly clay. Fill material comprised of anthropogenic materials was also observed in the northeast portion of the site.
Acid Sulfate Soils:	A review of the City of Parramatta (Sydney Olympic Park) Local Environment Plan 2012 within the NSW Planning Portal indicated the site was in an area of "Disturbed Terrain" and did not prescribe any requirement for development consent (or controls) for carrying out work. A review of the CSIRO Atlas of Australian Acid Sulfate Soils indicated that the site is within an area of "low probability of occurrence" of acid sulfate soils.
Hydrogeology:	The nearby Newington and Bicentennial Park Wetlands (located approximately 30 m north of the site) are nationally significant, although based on the NSW Planning Portal the site is not considered to include wetlands. The site is surrounded by constructed drainage basins (Narawang Wetland to the north) and estuaries (Haslams Creek to the south) connecting to the tide-dominated Parramatta River (approximately 750 m east). Groundwater is likely to flow in an easterly direction towards Haslams Creek and Parramatta River.

Table 3: Environmental Setting	
Detail	**Information**
Topography / Drainage:	Surface elevation across the site ranges from approximately 9 meters Australian Height Datum (mAHD) in the south to 5 mAHD in the north, with an approximate 3% grade. Surface water is expected to drain towards the stormwater drainage channels located in the centre and north-west of the site. Surface water and groundwater is anticipated to then flow east towards Haslams Creek approximately 150 m east of the site and the Parramatta River 750 m east of the site, which ultimately discharge into Wentworth and Homebush Bay. As the overall slope is <5% grade, the site poses a "Low Erosion Risk" as defined by the Blue Book.
Sensitive Receptors:	Sensitive environmental receptors are considered to include the environmental conservation area that surrounds the site and Haslams Creek and, Parramatta River.

3. Control Measures

3.1. Fauna Background

During construction, controls are to be implemented to protect local fauna during habitat removal and to prevent fauna, from entering the construction site. The F&FA and EIS noted:

- Applied Ecology concluded in the F&FA that the proposed development will not significantly impact threatened fauna when assessed against the provisions in the TSC 1995.
- After conducting the assessment of significance (7-Part Test) as required under Section 5(A) of the EP&A Act 1979, it was concluded that "the proposed development will not significantly impact on the biodiversity of the site and surrounding environmentally sensitive lands subject to the recommended mitigation measures being implemented".

Please refer to **Table 4** for the applicable controls during the construction phase of the project.

3.2. Flora Background

It is the purpose of this FFMP to note the findings of the F&FA and EIS while ensuring that any construction work that has the potential to impact flora in adjacent areas is prevented. Key findings from the F&FA and referenced in the EIS include:

- Potential impacts for Wilsonia backhousei and Estuarine Saltmarsh EEC during construction (as a result of stormwater run-off).
- Potential for weeds to invade and establish on site and in downstream environments during construction (as a result of disturbed ground and stormwater run-off).
- It is considered that there is very marginal habitat present for a number of species listed under the Threatened Species Conservation Act, 1995, or under the EP&BC Act.
- No threatened populations were recorded on or near the subject site.
- Trees that are to be removed are in poor condition and show signs of stress.

Furthermore, adjacent trees may be impacted by construction activities due to their proximity or due to factors such as vehicle movements. For this reason, controls will be implemented for the protection of remaining trees.

Please refer to **Table 4** for the applicable controls during the construction phase of the project.

3.3. Ecologist Recommendations

The following recommendations were made regarding prevention and mitigation measures to protect local fauna during construction (Applied Ecology 2017):

- A suitably licenced and experienced ecologist should be on site to ensure that animals (GGBF, Lizards etc.) are rescued and relocated prior to construction works. Timing of works is essential – rescue and relocation may need to be undertaken during decommissioning of the swales. Removal of gabions will need to accommodate an Ecologist on site before/during removal of gabions.
- GGBF have been recorded on the subject site during regular surveys conducted by SOPA. These may be encouraged by extended wet periods to venture beyond the Narawang wetland. Monitor for calls on site during and immediately after extended rain events. Project CEMP to include monitoring after high rainfall and an emergency plan to exclude GGBF from the works site during construction. Suitable responses would be temporary frog exclusion fencing (as per Section 3.5), for example, after high rainfall during mating season. Project CEMP to address excluding GGBF from work areas.

The control measures have been developed in line with these recommendations while also considering water and sediment run-off.

3.4. SOPA Specific Recommendations

The following recommendations were provided by Sydney Olympic Park Authority to protect local flora and fauna during construction:

- **HOLD POINT** – Prior to any construction, including the clearing of swales – The frog fence exclusion fence must be installed then inspected and endorsed by both the appointed ecologist (e.g. Applied Ecology) and by a representative of SOPA to confirm it is consistent with the design specifications. Any existing swales, gates, inlets and outlets impacted by construction activities will be identified by the Principal contractor and managed in accordance with this FFMP.
- Prior to and during the demolition of Swales – the pipe outlets must be capped at both the outer and inner ends to prevent fauna from coming into the worksite through these pipes or getting trapped within the pipes.
- **HOLD POINT** - Tree protections (trees to be retained) are a hold point for inspection by the appointed ecologist and SOPA. No trees are to be removed prior to obtaining SOPA's confirmation to do so.
- Construction work must only be undertaken during daylight hours as defined by condition D2 of the development consent i.e. 0700-1700 Monday to Saturday.
- **Exclusions Zone –** no works are to be undertaken within the E2 Environmental Conservation zones surrounding the site including stormwater connection works adjacent Nuwi Wetland without prior approval and consultation.
- Construction dewatering of rainwater/stormwater discharging to Nuwi Wetland must be undertaken in accordance with the approved Soil Water Management Plan for the project.
- Works outside the frog fence exclusion fence e.g. trenching for installation of services and stormwater line adjacent Hill Road Footpath. Trenches must be backfilled each night and exposed pipes capped, to reduce the risk of fauna becoming entrapped. The existing swale (currently concealed by mulch) must be reinstated following installation of the stormwater line adjacent Hill Road footpath.

3.5. Frog Exclusion Fence Specification

The temporary frog exclusion fence must be secure at the base to prevent frogs from crawling under and robust enough to last through the construction period. Gates in the fencing must be secured at the end of works each day and inspected (daily) for integrity as part of regular site environmental inspections checklist). Any damage must be immediately repaired.

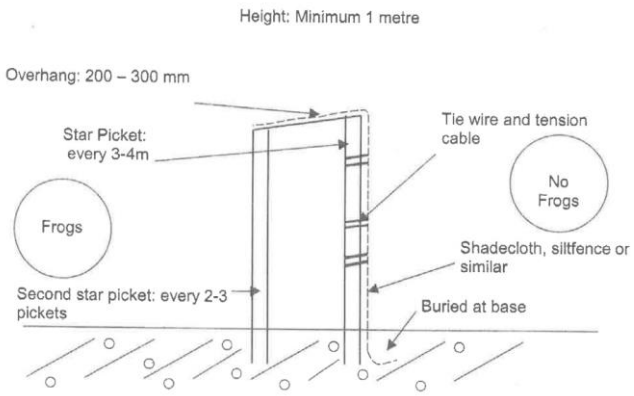


Image: Frog exclusion fence specification.

Image: Example frog exclusion fence.

3.6. Timeline of Events

Establishment of flora and fauna management controls will generally occur in the following order:

- Construction of the frog exclusion fence adequately encompassing the site to prevent fauna entering the construction site, primarily the Green and Golden Bell Frog.
- No works to occur outside of the approved construction site boundaries unless approved by SOPA through consultation with USS.
- Controls inspected periodically (daily) particularly following high rainfall events.
- All controls to remain for the duration of all construction activities, until permanent fixtures and controls are in place.

3.7. Criteria

Control measures to fulfil the Flora and Management obligations during the construction phase are outlined in **Table 4** below.

Table 4: Criteria for Flora and Fauna Control Measures

Control Measure	Function
Frog Exclusion Fence	To prevent the GGBF and other fauna entering the construction site. The frog exclusion zone must be constructed and approved by SOPA as per **section 3.6**.
Collection drains and filtration structures	Intercept and direct disturbed area runoff water to sediment dams/sumps. Reduces impact of run-off and excessive flows to the wetlands. Also reduces the potential for weed seed migration.
Timing of Works	Removal of gabions and swales should not occur during extreme heat or after heavy rainfall. Also, an Ecologist is to be present prior to and during the removal of these structures to monitor for the presence of fauna. This will allow for their collection and relocation.

Table 4: Criteria for Flora and Fauna Control Measures	
Control Measure	**Function**
Ongoing Monitoring	All control measures will be periodically inspected to ensure they are functional. Extra monitoring for the GGBF will also occur after heavy rainfall to ensure they have not entered the construction site. This will include and emergency measures to prevent access.
Induction procedures and pre-start meetings	Site induction for contractors and pre-start meetings will include information that addresses the control measures and the implementation of such under this sub-plan. They will also reiterate that works are not to occur outside of approved areas (for the protection of flora and fauna), as required.
Tree protection zones	Tree protection will be put in place to protect trees that are to remain or that are in close proximity to construction activities. Such protection measures may include root exclusion zones, structures to prevent trunk and limb damage, structures to prevent ground compaction. If unsure on the extent of controls required, the Principal Contractor will seek advice and consultation from a suitably qualified arborist and/or ecologist. If tree removal or trimming outside of the development consent is required, prior written consent must be obtained by SOPA.
Engaging a Qualified Arborist	All approved tree removal work is to be carried out by a licensed arborist with a minimum five years of continual experience within the industry of operational amenity arboriculture. The licensed arborist contractor will be covered by appropriate and current types of insurance to undertake such works and in accordance with AS 4373:2007. It is the responsibility of the Principal Contractor to engage a qualified arborist that addresses this requirement.

The Principal Contractor is responsible for the implementation of all control measures outlined within this FFMP.

In general, the control measures applied as part of the FFMP will be established concurrently with the erosion and sediment controls documented within the Soil Water Management Plan (SWMP) prepared by PRM (ref: P034987.001).

In the event of an emergency, such as danger to human life or damage to property, trees outside of the development approval may be cut or trimmed, as required.

3.8. Rectification Work

Any damage to or removal of flora or associated habitat outside of the approved consent or on the surrounding footpaths will be replaced and re-established to the satisfaction of the Sydney Olympic Park Authority.

4. Maintenance and Monitoring

Routine inspections of F&F controls, as well as inspections following rainfall events, will be undertaken by Contractor personnel. During these inspections, controls must be inspected for integrity and effectiveness. Inspections will be performed in conjunction with the inspections for other sub-plan disciplines and documented on the combined pro-forma checklist included in the CEMP. Further details pertaining to flora and fauna controls are provided in **Table 5** below.

Table 5: Flora and Fauna Control Inspection Record

Detail	Record (circle yes or no)	Corrective Actions
NAME: DATE: SIGNATURE:	• Frog exclusion fences adequately installed to prevent fauna entry? **Y/N** • Cut-off and collection channels constructed? **Y/N** • Drainage points appropriately protected? **Y/N** • Sediment control including silt fences and sandbags in place and working? **Y/N** • Inspection of controls carried out after rainfall events? **Y/N** • Inspection of area for GGBF (see below) carried out following rain event **Y/N** • Works occurring in the approved areas? **Y/N** • Any visible weeds occurring on-site? **Y/N** **When applicable** • Ecologist present for swale removal and documentation received? **Y/N** • Ecologist present for potential disturbance works in F&F areas? **Y/N** • Ecologist and SOPA representative present prior to any tree removal and confirmation received? **Y/N** • Arborist engaged for tree removal activities? **Y/N**	Applicable to any inspected item where **"No"** specified:

It will be the responsibility of the Principal Contractor to work in consultation with the ecologist to monitor the swales present onsite prior and during removal. Any works involving the swales will be carried out under the supervision and direction of the ecologist. All necessary monitoring, recording and associated reporting will be carried out by the ecologist and provided to the Principal Contractor.

The following phone number is provided should any clarification be required:

Applied Ecology – 0422 857 086

Image: Typical Green and Golden Bell Frog

Image: GGBF swimming

5. Response Procedures

5.1. Operational Response Process

Following rain events, the following will be undertaken:

- The project manager and site manager/supervisors will assign personnel to undertake control measure checks around the perimeter of the site.
- Contractor personnel will monitor areas within the site for the presence of GGBF.
- Any breaches in control measure functionality will be rectified before the commencement of site works.
- Checks and any corrective actions will be recorded on the Inspection Checklist.

In the event of damage to flora or associated habitat outside of the development consent the following will be undertaken:

- The event will be recorded and raised with USS.
- In consultation with USS and SOPA, rectification works will occur as required.

5.2. Complaint Response

All complaints received in relation to fauna management will be responded to in accordance with the Stakeholder Communication and Consultation Procedure. This provides details on how to receive, handle, respond to and record and action any community complaints.

Upon receipt of a complaint from the community, preliminary investigations will be undertaken as soon as practicable to determine the likely causes of the complaint using information such as approvals and site records. A response will be provided as soon as practicable, which may include the provision of relevant monitoring data.

5.3. Complaints Register

All community complaints must be recorded on a complaint register and the HSEQ manager must be notified of all complaints received.

6. Limitations

This report is confidential and has been prepared by Progressive Risk Management (PRM) for URBNSURF Sydney Pty Ltd (the client) in accordance with the terms and conditions provided within the Consultancy Agreement between the client and PRM. This report may only be used and relied upon by the client and must not be copied to, used by or relied upon by any person other than the client. If a third party (limited to only the owner of the property from the client) wishes to rely on this report, they will need to enter a Third-Party Reliance Deed with PRM.

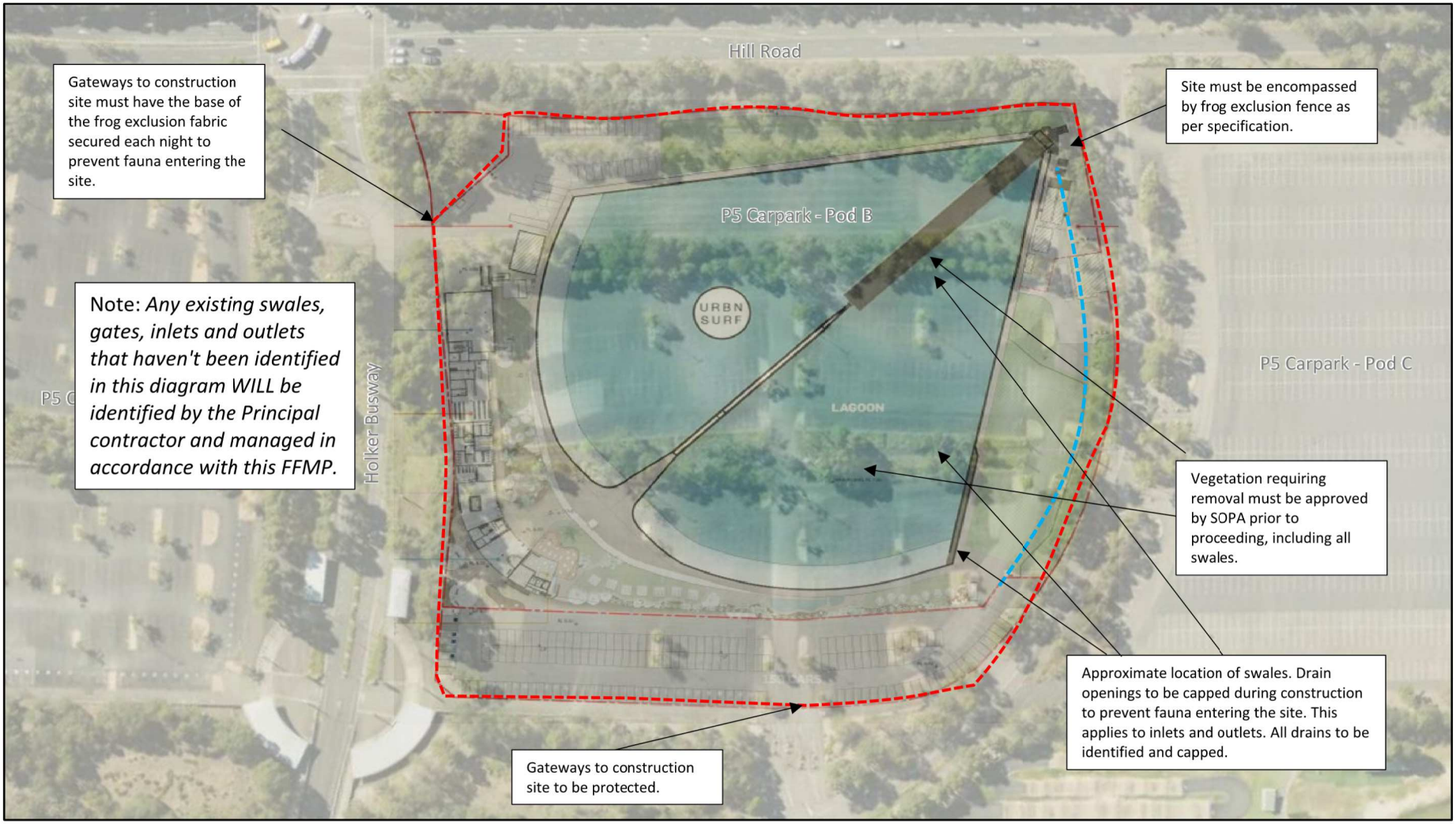
This report is limited to the observations made by PRM and information available and was limited to a desktop study only.

All results, conclusions and recommendations presented should be reviewed by a competent person before being used for any other purpose. PRM accepts no liability for use of, interpretation of or reliance upon this report by any person or body other than the client. Third parties must make their own independent inquiries.

This report should not be altered amended or abbreviated, issued in part or issued incomplete without prior checking and approval by PRM. PRM accepts no liability that may arise from the alteration, amendment, abbreviation or part-issue or incomplete issue of this report. To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by PRM and this report are expressly excluded (save as agreed otherwise with the client).

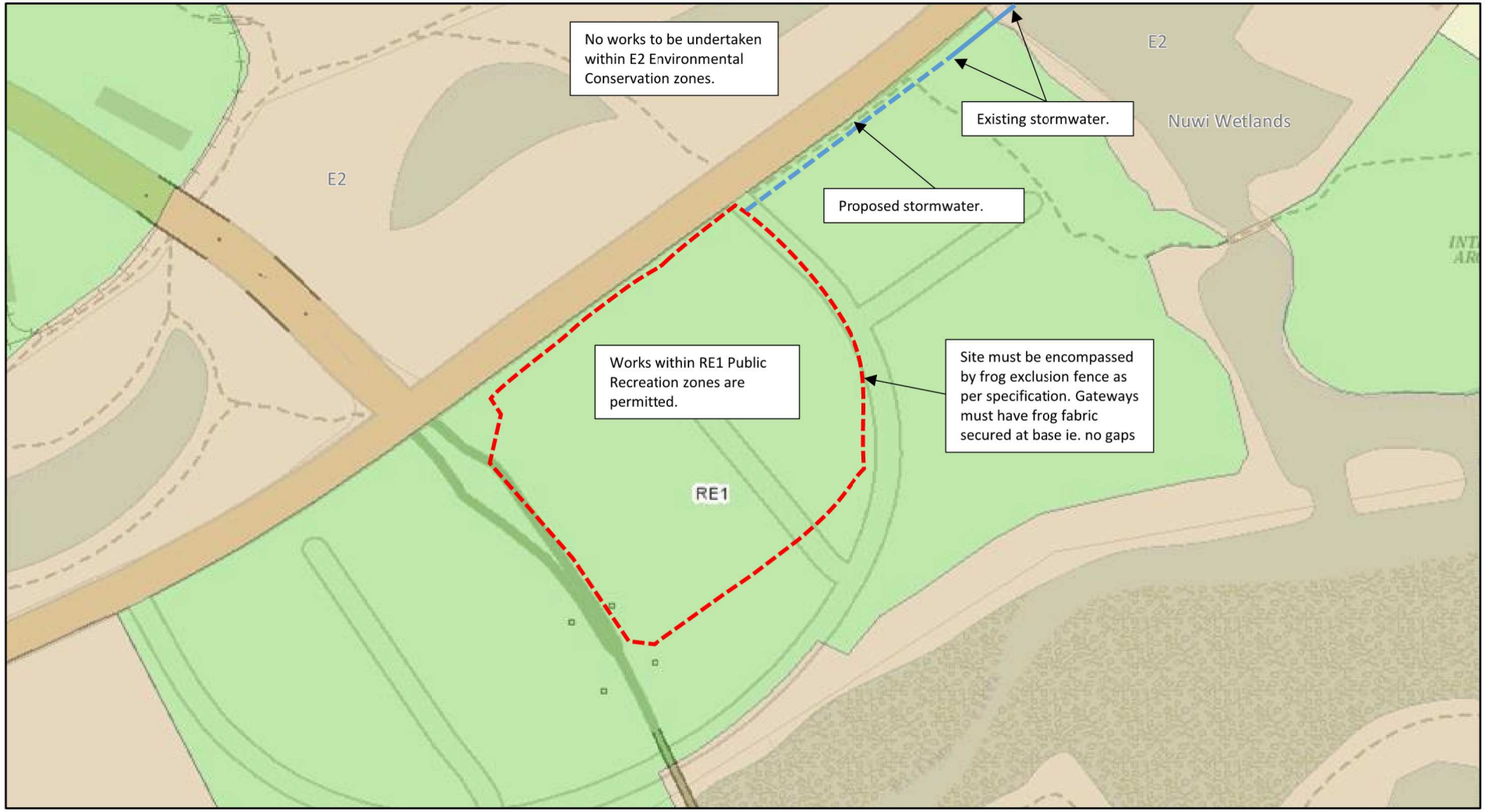
PRM shall bear no liability in relation to any change to site conditions after the date of this report. This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope and limitations defined herein (Scope of Works). Should information become available regarding conditions at the site including previously unknown sources of contamination, PRM reserves the right to review the report in the context of the additional information.

Figures



PROGRESSIVE RISK MANAGEMENT

LEGEND			
	Approximate Site Boundary	Report Name:	Flora and Fauna Management Plan
		Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW
		Client Name:	URBNSURF Sydney Pty Ltd
		Project Reference:	P034987.006
		Figure Number:	1
		Figure Name:	Site Layout



Source: NSW Planning Portal accessed 23 June 2021

~100 m

PROGRESSIVE RISK MANAGEMENT

LEGEND					
	Approximate Site Boundary	Report Name:	Flora and Fauna Management Plan		
	Appoximate Location of Proposed Stormwater Line	Site:	Corner Hill Road and Holker Busway, Sydney Olympic Park NSW		
	Appoximate Location of Existing Stormwater Line	Client Name:	URBNSURF Sydney Pty Ltd		
		Project Reference:	P034987.006		
		Figure Number:	2	Figure Name:	Site Zoning