Construction Environmental Management Plan

Integrated Nepean Hospital – Main Works

Project number:	N01038
Document number:	NHR-CPB-MPL-QLT-GEN-ALL-000PP11
Revision date:	01/03/2021
Revision:	05

Document Approval

Rev.	Date	Prepared by	Reviewed by	Recommended by	Approved by	Remarks
00	15-03-2019	P Newcombe	R Vranjesevic		S Garzo	
Signature:						
01	24-07-2019	D Green	P Newcombe		S Garzo	
Signature:						
02	20-10-2020	P Newcombe	R Vranjesevic		S Garzo	
Signature:						
03	24-04-2020	P Newcombe	K. Evans		S Garzo	
Signature:						
04	27-09-2020	K McCormick	M Mittiga		S Garzo	
Signature:						
05	01-03-2021	K McCormick	M Mittiga		S Garzo	
Signature:						

Details of Revision Amendments

Document Control

The Project Manager is responsible for ensuring that this plan is reviewed and approved. The Project Environmental Representative is responsible for updating this plan to reflect changes to environmental, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Manager and/or client before being distributed / implemented.

Revision Details

Revision	Details
00	1st Environmental Management Plan incorporating approval and contract requirements.
01	Management plan update following Main Works contract and internal audit findings.
02	Amended content requirements and updated management plans.
03	Updated elements 2-8 and appendix E, added Construction Noise & Vibration Assessment for out of hours works.
04	Review of Management Plan carried out. Minor updates to sub-management plans to include current site plans and conditions.
05	Review of Management Plan carried out. No changes required.

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1. Structure of This Plan

This Environmental Management Plan (EMP) outlines how we will achieve acceptable environmental outcomes on the Integrated Nepean Hospital redevelopment by the application of the CPB Contractors Environmental Management System (EMS). A copy of the most recent revision of this plan is to be retained on site for reference and compliance.

In addition to the Project Management Plan, other Project Plans that interface with the Environmental Management Plan include:

- Construction Management Plan
- Engineering and Design Management Plan
- Quality Management Plan
- Safety and Health Management Plan
- Completion Management Plan

The plan has the following structure:

Part A: Overview	This section clearly defines: ▪ Purpose and Scope of the EMP ▪ Environmental Contract Requirements ▪ Objectives and Targets ▪ Key environmental stakeholders ▪ Structure the Environmental Management System ▪ Summary of the Significant Environmental Hazards, specific client requirements, compliance requirements and project environmental performance targets
Part B: Implementation Plan	This section outlines in detail the key aspects for environmental management on the project including: ▪ Expectations ▪ How they will be met ▪ Responsibilities ▪ Associated deliverables
Part C: Environmental Sub-Plans	This section contains the Environmental Sub-Plans developed by the project to manage Significant Environmental Hazards and other potential major impacts upon the environment and community
Part D: Appendices	This section provides information supporting the EMP including: ▪ Environmental Policy ▪ Environmental Risk Register ▪ Environmental Roles and Responsibilities ▪ Site Environment Plan

2. Project overview

2.1 Purpose and scope

CPB Contractors has been contracted by NSW Health Infrastructure to provide construction and demolition services as part of the Integrated Nepean Hospital redevelopment (the Project). CPB Contractors has been appointed principal contractor in accordance with the *Environmental Planning and Assessment Act, 1979*, for the construction of the Project as detailed in the State Significant Development (SDD) approval SSD 8766 as issued by the NSW Department of Planning, Industry and Environment (DPIE) on 25 February 2019 (and modified 25 June 2019).

This Plan is established in accordance with 'The Way We Operate' framework and is the key document that integrates environmental planning approval requirements and client environmental requirements during project delivery. The Project Manager, with advice and input from senior construction staff, has overall responsibility for implementation of the Plan.

Implementation of the EMP will:

- Fulfil the requirements of the SSD approval (SSD 8766)
- Identify the environmental obligations attached to the tender / project and the hazards and risks associated with the works
- Assist in the prevention of unauthorised environmental harm
- Fulfil the client's environmental requirements as defined in the Contract, including complying with relevant permits and approvals
- Comply with all relevant environmental legislation
- Minimise negative impacts on the community that relate to the Project's environmental impacts
- Identify and implement feasible measures to reduce the environmental impact of the Project that are beyond contractual and compliance requirements
- Fulfil CPB Contractors' EMS requirements thereby enabling continued certification to ISO14001 and contribution to CPB Contractors' overall Business Plans.

The scope for the Project is to complete a major re-development of Nepean Hospital Campus and provide an advanced integration with existing community health centres within the surrounding wider Penrith Local Government Area.

The Project's scope of work includes:

- A new clinical services block
- A new and expanded Nepean Hospital Emergency Department
- Expanded and upgraded medical imaging
- Twelve new operating theatres
- Eighteen birthing suites in new accommodation
- A new Neonatal Intensive Care Unit
- More than 200 overnight beds in new accommodation
- A new helipad
- A new facility for Community Health Services (St Mary's, excluding land acquisition), and
- Expansion of the existing medical oncology services

2.2 Environmental Approval and Contract Requirements

Table 1 lists conditions from SSD 8766 that are relevant to the CEMP and subplans where each condition has been addressed within this Plan or the wider CPB Contractors Management System. Table 2 lists contract requirements that are relevant to environmental management during construction and where these requirements have been addressed.

Table 1 Conditions of Approval directly related to this CEMP

SSD Reference	Content requirements	Where addressed
B10	Unexpected Contamination Procedure Prior to the commencement of earthworks, the Applicant must prepare an unexpected contamination procedure to ensure that potentially contaminated material is appropriately managed. The procedure must form part of the of the CEMP in accordance with condition B20 and where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing are to be submitted to the Planning Secretary, prior to its removal from the site.	Flood Emergency Response Plan Remediation Action Plan, 7.1
B19 (a)	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include: detailed baseline data;	Part C: Environmental Aspects and Impacts
B19 (b)	details of: (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Element 3:3.1 Element 3:3.4 Part C: Environmental Aspects and Impacts
B19 (c)	a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Part C: Environmental Aspects and Impacts
B19 (d)	a program to monitor and report on the: (i) impacts and environmental performance of the development; (ii) effectiveness of the management measures set out pursuant to paragraph (c) above;	Appendix D: MIRRA Schedule
B19 (e)	a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Element 9: Incident Management
B19 (f)	a program to investigate and implement ways to improve the environmental performance of the development over time;	3.2 Improvement Element 12:Auditing, Review and Improvement

SSD Reference	Content requirements	Where addressed
B19 (g)	a protocol for managing and reporting any: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); (ii) complaint; (iii) failure to comply with statutory requirements; and	Element 9: Incident Management
B19 (h)	a protocol for periodic review of the plan.	Element 12: Auditing, Review and Improvement
B20	The applicant must prepare a Construction Environmental Management Plan (CEMP)	This document
B20 (a)	i) Hours of Work	Element 3: 3.3 Element 6: 6.2
B20 (a)	ii) 24 Hour Contact	2.4 Key Environmental Stakeholders
B20 (a)	iii) Management of dust and odour to protect the amenity of the neighbourhood	Air Quality Subplan, 15.4
B20 (a)	iv) Stormwater control and discharge	Construction Traffic and Pedestrian Management Sub-Plan Construction Noise and Vibration Subplan Construction Waste Management Subplan Construction Soil and Water Management Subplan, 3.2
B20 (a)	v) Measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site	

SSD Reference	Content requirements	Where addressed
		Construction Traffic and Pedestrian Management Sub-Plan Construction Noise and Vibration Subplan Construction Waste Management Subplan Construction Soil and Water Management Subplan, 3.2
B20 (a)	vi) Groundwater management plan including measures to prevent groundwater contamination	Flood Emergency Response Plan Remediation Action Plan, 9.15
B20 (a)	(vii) External lighting in compliance with AS 4282-1997 Control of the obtrusive effects of outdoor lighting	Element 3: 3.3
B20 (a)	viii) Community consultation and complaints handling;	Element 6: Communication and Consultation
B20 (g)	an unexpected finds protocol for contamination and associated communications procedure;	Flood Emergency Response Plan Remediation Action Plan, 7.1
B20 (h)	an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure;	Heritage Subplan, 12.5
B20 (i)	waste classification (for materials to be removed) and validation (for materials to remain) be undertaken to confirm the contamination status in these areas of the site; and	Construction Waste Management Subplan, 3.2

Table 2 Contract requirements for environmental management

Contract Reference	Content requirements	Where addressed
GC21 Preliminaries – 6.1	Submit an Environmental Management Plan that complies with the NSW Government *Environmental Management Systems Guidelines* (EMS Guidelines). The EMS Guidelines are available on the ProcurePoint website.	▪ This plan
GC21 Preliminaries – 6.1	The Environmental Management Plan must address the following risks: ▪ Erosion and sediment control ▪ Protection of existing trees ▪ Noise, Dust and vibration control measures including monitoring inside and outside the Hospitals and Community Health Centres, and any other key areas nominated by the Principal ▪ Removal and remediation of any discovered asbestos, lead, or synthetic fibrous containing materials	▪ Part C: Environmental Aspects and Impacts
GC21 Preliminaries – 6.1	This list of risks is not exhaustive and must not be relied upon by the Contractor. The Contractor must undertake its own detailed analysis of all environmental risks under the Contract.	▪ Appendix C: Environmental Risk Register ▪
GC21 Preliminaries – 6.1	Submit an Environmental Management Monthly Report with each claim for payment, signed by the Contractor's representative and including the information specified below, as evidence of implementation of the Environmental Management Plan. ▪ Contract details - the names of the Contract, Contractor and Contractor's representative, the report date and the period covered. ▪ Implementation of environmental management - details of: – the environmental risks and opportunities, and significant environmental impacts associated with the work; – environmental objectives, targets and measures of performance (where practical); and – management actions, including environmental controls, training, inspections and testing. ▪ Implementation of incident management, including emergency response - details of: – all environmental incidents or emergencies, including non-compliance with environmental procedures and near misses, implementation of incident and emergency response management, and implementation of corrective action. ▪ Implementation of reviews - details of internal reviews, audits and inspections undertaken to verify that on-site environmental processes and practices conform with the Environmental Management Plan, including:	▪ Element 12: 12.2

Contract Reference	Content requirements	Where addressed
	– monitoring, measurement, evaluation and review of activities; – the consequences of non-conformances; – investigation, analysis, evaluation and follow-up verification; and – corrective and preventive action taken.	
GC21 Preliminaries – 6.1	Ensure compliance with the notification and other requirements of the Protection of the Environment Operations Act 1997 (POEO Act). Immediately notify the Principal of any pollution incident that may cause material harm to the environment, providing evidence that notification requirements of the POEO Act have been met, where applicable. Report immediately the details of any waste removed from the Site and not disposed of at a lawful facility. When requested, provide an incident investigation report, including identification of the cause of the incident and corrective actions taken, in the form directed.	▪ Element 9: Incident Management ▪ Element 10: Emergency Planning and Response ▪ Element 11: Document and Record Management
GC21 Preliminaries – 6.2	Apply strategies to maximise the achievement of ecologically sustainable development in the design, construction and operation of the Works, including reducing pollutants, greenhouse gas emissions and demand on non-renewable resources such as energy sources and water. Incorporate applicable strategies and objectives in the Environmental Management Plan.	▪ 2.3 Objectives and Targets ▪ Element 2: 2.2 ▪ Element 3: 3.6 ▪ Energy
GC21 Preliminaries – 6.3	Implement waste minimisation and management measures, including: ▪ recycling and diverting from landfill surplus soil, rock, and other excavated or demolition materials, wherever practical; ▪ separately collecting and streaming quantities of waste concrete, bricks, blocks, timber, metals, plasterboard, paper and packaging, glass and plastics, and offering them for recycling where practical. Ensure that no waste from the Site is conveyed to or deposited at any place that cannot lawfully be used as a waste facility for that waste.	▪ Construction Waste Management Subplan, 3.2 ▪ Construction Waste Management Subplan, 3.4, Table 6 ▪ Flood Emergency Response Plan ▪ ▪ Remediation Action Plan, 9.0
GC21 Preliminaries – 6.3	Monitor and record the volumes of waste and the methods and locations of disposal. Submit a progress report every two months, and a summary report before Completion, on the implementation of waste management measures, including the total quantity of material purchased, the quantity purchased with recycled content, the total quantity of waste generated, the total quantity recycled, the total quantity disposed of and the method and location of disposal in the form of a Waste Recycling and Purchasing Report available on the ProcurePoint website.	▪ Appendix D: MIRRA Schedule ▪

Contract Reference	Content requirements	Where addressed
	With the Waste Recycling and Purchasing Report, submit waste disposal certificates and/or company certification confirming appropriate, lawful disposal of waste.	

2.3 Objectives and Targets

The Project has set the following environmental performance targets in Table 3 and Table 4. These include current business plan environmental targets for the Business Unit and the whole of CPB Contractors.

Table 3 Leading performance indicators

Key Performance Indicator	Target	Time Frame	Actions to be Taken	Accountability
SHEQ observations	Four observations conducted per member of leadership team per month	Each month	Four observations to be performed by each member of the leadership team per month	Project leadership team
Completion of inspections	100 per cent of scheduled inspections of environmental controls occur	Each month	Inspections of environmental controls to be identified, scheduled and conducted	Project Environment Representative

Table 4 Lagging performance indicators

Key Performance Indicator	Target	Time Frame	Actions to be Taken	Accountability
Level 1, 2 and HPI environmental incidents	Zero	Duration of Project	Implementation of the EMP and compliance with legislation to limit pollution incidents	Project Manager
Number of actions taken by regulators and/or client	Zero	Duration of Project	Implementation of the EMP to manage compliance with approvals and limit pollution incidents	Project Manager
Area of land cleared or disturbed without authorisation	Zero ha	Duration of Project	Implementation of clearing procedure and compliance with the Fauna and Fauna Sub Plan	Project Manager
Number of unauthorised water discharges	Zero	Duration of Project	Implementation of Soil and Water Sub Plan	Project Manager
Damage to heritage items or places without relevant approvals	Zero	Duration of Project	Identification and protection of heritage items and locations, Implementation of Heritage Sub Plan	Project Manager
100% of all fuel use and GHG emissions generated by the project is captured and entered into JDE (NGER reporting requirement).	All use / emissions entered into JDE System	Monthly	Implementation of Energy Sub Plan and auditing of energy and fuel consumption	Project Manager

Key Performance Indicator	Target	Time Frame	Actions to be Taken	Accountability
% of waste reused or recycled	[75%] of waste generated [note waste types excluded from calculation must be defined]	12 months	Tracking of waste, implementation of a waste register and Implementation of Waste Sub Plan	Project Manager

2.4 Key Environmental Stakeholders

Key environmental stakeholders related to the project and their contact details are listed in Table 5.

Table 5 Contact details for key environmental stakeholders

Stakeholder Name	Representative	Contact Details
NSW Health Infrastructure	Mohammed Ashari	0410 966 694 Mohammad.Ashari@health.nsw.gov.au Principal Authorised Representative
CBRE	Carlo Biaro	0405 322 088 Carlo.Biaro@cbre.com
CPB Contractors Pty Ltd	Steve Garzo	0409500301 Steve.Garzo@cpbcon.com.au
CPB Business Unit Environmental Representative (NSW/ACT)	Tracey Doczy	0411 952 658 02 9035 5870 Tracey.Doczy@cpbcon.com.au
CPB Project Environmental Representative	Patrick Newcombe	0408191269 Patrick.Newcombe@cpb.con.com.au
Penrith City Council	Hamish Dodson	(02) 4732 7777
Office of Environment and Heritage (EPA) (Now NSW Department of Planning, Industry and Environment)	N/A	131 555 02 9995 5000 info@environment.nsw.gov.au
Building Compliance – Certifying Authority	Adam Durnford	0499 088 065 02 9211 7777 adam@bmplusg.com.au
Site Manager 24hr Contact	Mark Foster	0408 191 269 Mark.Foster@cpbcon.com.au

3. Environmental Management System

3.1 System Overview

3.1.1 Governance documentation

The Environmental Management System (EMS) is based on the requirements of the CPB Management System and has been specifically tailored to ensure compliance with NSW Health Infrastructure additional Environmental requirements. The Project Management Plan provides more detail about 'The Way We Operate' and the process adopted to deliver against NSW Health Infrastructure overall requirements.

The CPB Contractors management system is certified to conform to:

- AS/NZS ISO 14001:2015 Environmental management systems – Requirements with guidance for use.

The CPB Management System has been developed and implemented to ensure a consistent approach to project delivery. The management system comprises the following components:

- A Policy is a statement of strategic intent and commitment and defines the minimum mandatory requirements that CPB Contractors expects all levels of the organisation to comply with.
- The Project Management Plan outlines how the Project will be managed and it is supported by a suite of functional management plans.
- Procedures and Work Instruction specify how to undertake and control specific activities. They also list accountable roles and the tools and knowledge to be used. Where appropriate and approved by the respective Business Unit functional manager, project specific procedures may be produced to reflect specific project circumstances.
- Tools are preformatted documents such as forms and templates that are required to be completed as part of a Procedure.
- Knowledge documents are reference material to provide context, additional information or guidance to a Policy or Procedure.
- Business Applications are the software tools used to manage our business and support our operations.

Figure 1 CPB Contractors Management System

3.1.2 Environmental Management Plans

Each project maintains an Environmental Management Plan (EMP) that describes the actions to be implemented by that project to comply with each Element and Expectation. The Project's EMP must demonstrate that:

- Contractual environmental requirements are being fulfilled
- The Project is compliant with all relevant environmental legislation
- The effect of environmental impacts on the community is minimised

3.1.3 Procedures, Knowledge and Tools

A procedure describes the steps to be undertaken to complete an activity, the accountable roles and the tools and knowledge to be used.

Tools are preformatted documents (forms and templates) used to collect specific data or information for a particular purpose.

Knowledge documents are reference material to provide context, additional information or guidance to a Policy or Procedure.

Business Applications are the software tools used to manage and support our operations.

3.2 Improvement

In addition to specifying the day-to-day environmental management of a project, each EMP details activities to be performed to deliver continual improvement in environmental performance.

Continual improvement is achieved through constant measurement and evaluation, audit and review of the effectiveness of EMP and adjustment and improvement, project environmental outcomes, and CPB Contractors EMS.

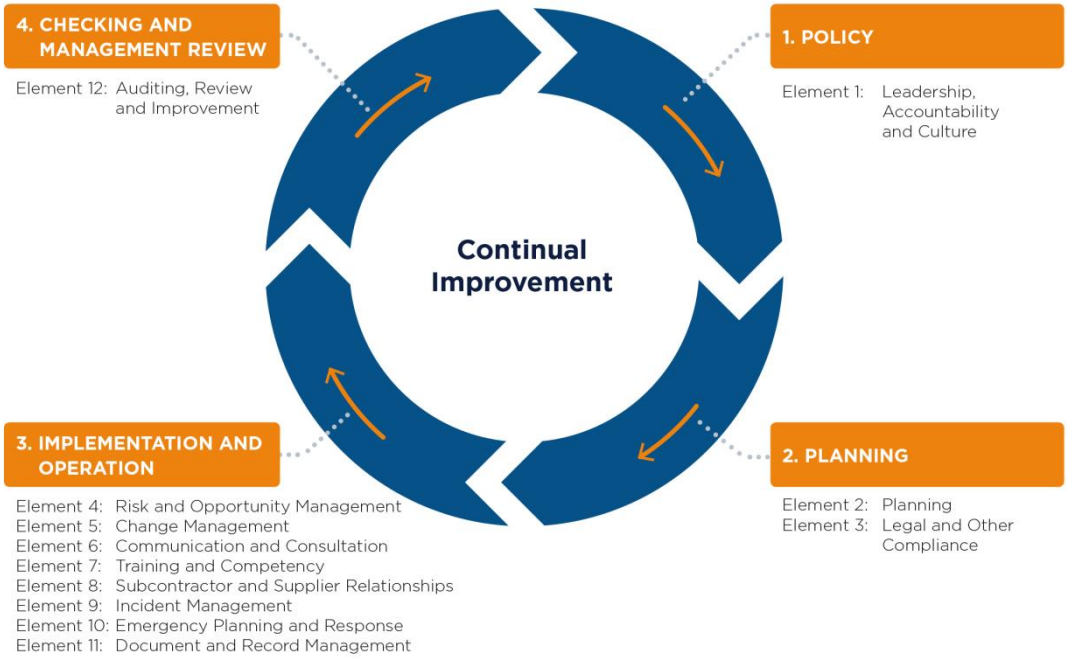


Figure 2 Continual Improvement Mechanism

3.3 Interactions with Other Management Plans

This EMP is part of an integrated set of project management plans. The specific elements and linkages between the environmental plan and other project plans are detailed in Part B of this document.

4. Significant Environmental Hazards and Environmental Sub Plans

Significant Environmental Hazards (SHE) related to this Project are listed in Table 6. SEHs have been identified through the review and analysis of environmental reports, contractual documents, community and legal compliance requirements relating to the Project and professional experience. Each of the Sub Plans listed will be regularly reviewed during construction as the project risks are reviewed.

Table 6 Significant environmental hazards

Environmental Hazards (Aspect)	Associated Significant Environmental Impact (Risk)	Environmental Sub Plans (Part C)
Impact to Heritage	Discovery and/or damage to previously unidentified Heritage items/areas	Heritage Management Sub Plan
Impact to flora and/or fauna	Loss of or harm to flora or fauna through impact, habitat loss and incidents	Flora and Fauna Management Sub Plan
Impact to local water quality	Degradation of water quality, harm to flora and fauna through spills and pollution events	Soil and Water Management Sub Plan
Dust impacts	Aesthetic and health related impacts from emissions and construction dust	Air quality Management Plan
Pollution of air/ odour/ emissions	Aesthetic and health related impacts from emissions and chemicals	Air Quality Management Sub Plan
Acoustic impacts to surrounding locations/ sleep disturbance	Aesthetic impacts, sleep deprivation from construction activity	Noise and Vibration Sub Plan
Structural / cosmetic damage to property through vibration	Aesthetic and/or structural concerns, damage to structures from vibratory construction activity	Noise and Vibration Sub Plan
Disturbance of contaminated material	Health related impacts due to unexpected discovery of contamination, poor management during construction and inappropriate waste management and disposal	Acid Sulfate Soil Sub Plan
Impacts to hospital access / traffic	Disruption to emergency and hospital services, congestion, loss of parking through construction impacting access or travel routes	Traffic Management Sub Plan
Flooding impacts	Inundation, pollution and loss of access through altered hydrology	Flood and Emergency Response Plan
Illegal dumping / waste disposal	Health related impacts through inappropriate waste management and disposal	Waste and Energy Management Sub Plan
Sustainability and energy consumption impacts	Generational impacts, resource consumption, waste generation and improper practices in resource usage	Waste and Energy Management Sub Plan

5. Elements and Expectations

The Environmental Management Plan is structured using a common set of Elements and Expectations:

Element	Key aspects for managing this function on the Project
Expectation	The high-level outcomes achieved as part of each Element

This two-level hierarchy provides a consistent structure that is applied across all Management Plans on the Project. Those Elements are:

- Element 1: Leadership, Accountability and Culture
- Element 2: Planning
- Element 3: Legal and Other Requirements
- Element 4: Risk and Opportunity Management
- Element 5: Change Management
- Element 6: Communication and Consultation
- Element 7: Training and Competency
- Element 8: Subcontractor Relationships
- Element 9: Incident Management
- Element 10: Emergency Planning and Response
- Element 11: Document and Record Management
- Element 12: Auditing, Review and Improvement

Element 1: Leadership, Accountability and Culture

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
1.1 Environmental accountabilities, roles and responsibilities for managers, staff, employees and subcontractors are clearly defined, documented and communicated	**Roles and Responsibilities** Environmental responsibilities are included in all Position Descriptions. Roles that carry specific environmental accountabilities (e.g. those that supervise or manage work with specific environmental risks) will contain more detailed environmental content. The environmental responsibilities contained in Position Descriptions are communicated to each person by their immediate supervisor upon commencing in their role.	**P&C Manager** Project Environmental Representative Line managers	Position Descriptions
1.2 Environmental leadership and commitment is demonstrated through measurable participation in environmental management	**Participation and Measurement** All personnel in leadership roles on the Project participate in environmental management activities, including observations, incident reviews and HSE committee meetings. In addition, project management will: Regularly review environmental performance against Project KPIs and raise corrective actions to maintain or improve environmental performance as necessary Address pertinent environmental matters at communication forums.	**Project Manager** Line managers Functional managers Supervisory staff Project Environmental Representative	Measurement system output to include: Observation records, Incident reviews, HSE Committee meeting attendance (minutes), delivering toolbox talks
1.3 Environmental expectations are clearly defined with appropriate reward and disciplinary processes in place.	**Environmental Policy** The CPB Contractors Environmental Policy is communicated in project inductions and prominently displayed at the Project. **Project Environmental Rules** The Project Manager and Project Environmental Representative will assist in development of "Project Rules" during Project start-up to address key environmental matters. These rules will be documented, communicated and prominently displayed at the Project and will be reviewed at least every six months. Any person who breaches these rules will be managed in accordance with CPB Contractors requirements for counselling, discipline and, if needed, termination.	**Project Manager** All personnel	Environmental policy displayed and communicated in site inductions Project Rules Environmental objectives and targets defined (Part A)

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	Performance Targets Environmental objectives and targets for the Project have been identified in Part A of this document. The associated key performance indicators (KPI) include lead and lag indicators. Measurable targets have been set for each objective and an applicable time frame nominated. The targets are in line with CPB Contractors Corporate and Business Unit targets.	**Project Manager** Project Environmental Representative	Monthly reports

Element 2: Planning

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
2.1 Adequate resources are provided to effectively implement the EMP	**Resources** The Project budget includes sufficient allowances to implement the EMP, including people, technical environmental expertise, equipment, materials, training, plant, and infrastructure. The Project Environmental Representative is consulted in setting and revising (forecasting) the Project budget. Sufficient people are appointed to the Project to implement the EMP.	**Project Manager** Commercial Manager Project Environmental Representative P & C Manager	Project budget Project forecasts Organisational structure Training schedule
	Environmental Monitoring The Project Environmental Representative is accountable for developing the Environmental Monitoring Schedule(s) prior to any works commencing on the project. The Project Environmental Representative will identify all equipment, equipment maintenance (including calibration) and personnel required to implement the schedule and ensure necessary allowances in the Project budget and forecasts. All environmental monitoring on the Project is planned according to the requirements of the Knowledge document Environmental Monitoring and is defined where relevant in the Environmental Sub-Plans within Part C of this Plan.	**Project Environmental Representative**	MIRRA schedule Monitoring results
2.2 Business systems are defined and established	**Define and set up IT Systems** Applications required to management environment on the Project are defined and established prior to works commencing. Systems to be used include: ▪ **Synergy** - Reporting and recording all environmental incidents, audit results and corrective actions ▪ **Synergy** - To schedule all inspections and environmental monitoring activities and track completion of scheduled activities ▪ **SHE Risk Register** – To manage environmental risk registers ▪ **JD Edwards** (NGER module) to capture energy use and emissions, and water and waste data ▪ **Incite** – Records and documents management and archiving ▪	**Project Environmental Representative**	Applicable business systems
2.3 Environmental Sub-Plans are prepared and maintained for Significant Environmental Hazards	**Identify Significant Environmental Hazards (SEH)** Significant environmental hazards relating to the project's activities have been identified through the review and analysis of environmental reports, contractual documents, and community and legal compliance requirements relating to the Project and supported by professional experience of the assessor. The project SEH list in Part A is reviewed by the Project Environmental Representative at a minimum of 6 monthly intervals. The review should be supported by the current environmental risk	**Project Environmental Rep**	Significant Environmental Hazards and Environmental Sub-Plans listed in Part A Sub-Plans contained in Part C

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	and opportunities identification and analysis assessment and project environmental performance.		
	Environmental Sub-Plans Environmental Sub-Plans (Part C) are reviewed for on-going relevance and accuracy by the Project Environmental Representative. The frequency of review is triggered by incident history, changes to the project, including contract variations, and management review requirements. Reviews are documented and records retained in the project document management system.	**Project Environmental Rep**	Reviews of SEH and environmental Sub-Plans

Element 3: Legal and Other Requirements

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
3.1 Relevant legal, contractual and other requirements are identified and maintained in a legal and other obligations register	**Identifying Environmental Obligations** The Project Environmental Representative has reviewed the Contract, construction methodology and program and identified all: ▪ Contractual conditions specific to environmental management. ▪ Regulatory approvals required and associated conditions. ▪ Specific requirements of local, state and federal laws that are additional to the requirements of Project approvals using CPB Contractors' online subscription to EnviroLaw. ▪ Targets and objectives in CPB Contractors Business Unit or whole of CPB Contractors Business Plans. The sources and details of, and means of compliance with the above, are captured within a compliance monitoring and reporting program. Documentary evidence must be available to show that all owners of obligations have been informed of their responsibility and are able to deliver the obligation.	**Project Environmental Representative** Project Manager	Compliance monitoring and reporting program(s) Business critical environmental obligations included in Project's Rights and Obligations Summary Project Management Plan, insert reference to relevant section
3.2 All necessary environmental approvals are obtained prior to commencing relevant works and surrendered on completion	**Obtaining and Surrendering Environmental Approvals** Approvals required to deliver the project are obtained prior to the commencement of any activities relating to the scope of the approval. The timing to obtain each necessary regulatory approval is determined and included within the Project program linked to relevant activities. Details of all approvals and licences (including applications and decision notices where appropriate) are maintained in the Project's compliance monitoring and reporting program. All regulatory approvals will be surrendered according to the requirements of the approval or, where not stated, as soon as practical following the completion of the activity to which the approval relates. A compliance monitoring and reporting program will be updated to include conditions associated with newly received regulatory approvals.	**Project Environmental Representative** Engineers Project Manager	Environmental approval documentation Approval conditions entered into Project's Compliance monitoring and reporting program Updated Compliance monitoring and reporting program
3.3 Work is planned and executed to ensure compliance	**Planning for Compliance** The Project Environmental Representative is consulted upon commencement of development of all Construction Area Plans (CAPs) and Work Packs, and throughout their development. All controls necessary to ensure compliance are included in the CAPs and Work Packs and in the Environmental Sub-Plans (Part C of this Plan). CAP's and Work Packs should include Site Environmental Plans that clearly shows the controls to be implemented. The Project program is updated to include new approvals determined to be necessary following the review of work plans.	**Construction Manager** Supervisors Engineers Project Environmental Representative Engineering Manager	Reviewed CAPs and Work Packs by Project Environmental Rep Update project program

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	CAPs and Work Packs are reviewed by the Project Environmental Representative prior to the commencement of works described in their scope.		
	Hours of Work Construction, including the delivery of materials to and from the site, may only be carried out between the following hours: (a) between 7am and 6pm, Mondays to Fridays inclusive; and (b) between 7am and 5pm, Saturdays. No work may be carried out on Sundays or public holidays. Activities may be undertaken outside of the hours identified above if required: (a) by the Police or a public authority for the delivery of vehicles, plant or materials; or (b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or (c) where the works are inaudible at the nearest sensitive receivers; or (d) where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works. Notification of such activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours: (a) 9am to 12pm, Monday to Friday; (b) 2pm to 5pm Monday to Friday; and (c) 9am to 12pm, Saturday.	**Project Environmental Rep** **Project Manager**	Environmental Monitoring
	External lighting in compliance with AS 4282-1997- Lighting will be installed to meet the minimum standard. Lighting will provide wide and even spread of illumination but will also meet operational requirements. External lighting will be installed so as to not result in any light spill or other lighting related impacts on surrounding locality	**Project Environmental Rep** **Project Manager**	Environmental Monitoring
	No later than two weeks before the date notified for the commencement of construction, a Compliance Monitoring and Reporting Program prepared in accordance with the Compliance Reporting Post Approval Requirements (Department 2018) must be submitted to the Department and the Certifying Authority Compliance Reports of the project must be carried out in accordance with the Compliance Reporting Post Approval Requirements (Department 2018)	**Project Environmental Rep**	Compliance Monitoring and Reporting Program

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	Within 6 months of the commencement of construction, the Applicant must register for a minimum 4 star Green Star rating with the Green Building Council Australia and submit evidence of registration to the Certifying Authority unless the NSW Health Engineering Services Guidelines are updated demonstrating equivalency with an accredited rating scheme to the satisfaction of the Planning Secretary.	**NSW Health Infrastructure**	Green star registration
	Prior to any clearing or construction works, the Applicant must purchase 2 ecosystem credits to offset the removal of native vegetation on site. The ecosystem credits must be determined in accordance with the OEH's Framework for Biodiversity Assessment (FBA) and the Biobanking Assessment Methodology 2014 (BBAM).	**NSW Health Infrastructure**	Ecosystem credit procurement
	Demolition work must comply with Australian Standard AS 2601-2001 The demolition of structures (Standards Australia, 2001). The work plans required by AS 2601-2001 must be accompanied by a written statement from a suitably qualified person that the proposals contained in the work plan comply with the safety requirements of the Standard. The work plans and the statement of compliance must be submitted to the Certifying Authority before the commencement of works.	**Project Manager**	Demolition Management Plan
3.4 Inspections, observations and monitoring are performed to ensure compliance is maintained	**Implementing Controls** Controls required to achieve compliance, as detailed in the CAPs and Work Packs, will be implemented before relevant works commence. The compliance monitoring and reporting program contains an explanation, or link to an Environmental Sub-Plan containing an explanation, of how compliance with each listed requirement is to be achieved and how the project will regularly demonstrate compliance with the requirement (if relevant).	**Supervisors** Engineers Project Environmental Representative	Engineered (physical) and administrative controls (e.g. procedures, forms, training) in place
	Inspections and Observations Controls are to be inspected regularly to ensure their ongoing suitability and effectiveness. Inspections and observations are planned and conducted according to the requirements of the Workplace Hazard Inspections and Observations Procedures. Inspections and observations are scheduled using Synergy. The outcomes of inspections are captured on the inspection checklists. Corrective actions are raised, tracked and closed out in the Synergy – Action Plan Module or through the inspection records (for actions closed out within 72 hours) for all controls found to be inadequate.	**Supervisors** Engineers Project Environmental Representative	Observation records Inspection schedules Inspection checklists Corrective actions in Synergy – Action Plan Module or inspection records
	Environmental Monitoring Environmental monitoring is carried out to confirm compliance with the conditions of environmental approvals and laws, and to provide early indication of potential adverse impacts to the environment or community. All monitoring is planned and conducted according to the requirements of the procedure Environmental Monitoring and as detailed in the Environmental Sub-Plans (Part C of this Plan).	**Project Environmental Representative**	Environmental Monitoring Schedule Monitoring records Calibration records Corrective actions

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	Environmental monitoring results are interpreted to identify actual and potential non-compliances and events that may result in nuisance, environmental harm, and unacceptable loss of amenity or community complaints. Corrective actions are taken immediately or are raised and managed using Synergy		
	All plant and equipment used on site, or to monitor the performance of the development must be: a) maintained in a proper and efficient condition; and b) operated in a proper and efficient manner.	**Project Environmental Rep**	Compliance Monitoring and Reporting Program
3.5 All non-compliances are reported as incidents	**Reporting Non-Compliances** All non-compliances are recorded and reported as incidents in the Synergy. This includes events involving an action being taken against the project by a regulator. The Department must be notified in writing to compliance@planning.nsw.gov.au within seven days after the identification of any non-compliance. The Certifying Authority must also notify the Department in writing to compliance@planning.nsw.gov.au within seven days after they identify any non-compliance. The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	**Project Environmental Representative** All personnel	Incident reports
3.6 All energy and greenhouse data are collected and entered into JDE	**Greenhouse and Energy** *All subcontractor fuel use to be collated and entered into the JDE NGER Module at the site level.* *Projects will track subcontractor energy reporting.* *All relevant records relating to the reporting of NGER data will be retained with project records for seven years.* *Any NGER data to be reported to the client will be extracted from JDE using the Business Intelligence Tool.* All energy (fuels, oils, greases, gases, electricity, solvents) purchased by Leighton Contractors and processed through JDE are captured centrally at the Group level.	**Project Environmental Representative** Commercial Manager Project Manager	NGER subcontractor register NGER data checklist Completed NGER subcontractor records Monthly HSE Statistical reports

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	If a project is not using CPB JDE, both invoiced and contractor energy use must be collated and entered into Synergy monthly by the Project Environment Representative.		
3.7 Personnel on the site have access to current versions of relevant legislation, standards and codes of practice	**Updates to Legislation, Standards and Codes of Practice** Access to all relevant legislation will be available to personnel via EnviroLaw or other online resources (e.g. state or Commonwealth government websites or www.austlii.edu.au). Updates to legislation, standards and codes of practice will be reviewed to determine relevance. Work practices, the Environmental Sub-Plans attached to this EMP, and compliance monitoring and reporting program will be altered where appropriate to ensure compliance and all affected personnel informed in a timely manner. Regulatory approvals will be obtained or amended as necessary, work practices altered to ensure compliance and all affected personnel informed in a timely manner.	**Business Unit Environmental Representative** Project Environmental Representative	Updates distributed

Element 4: Risk and Opportunity Management

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
4.1 Systematic processes are defined and implemented for identifying environmental risks and opportunities at all stages of the Project	**Identifying Environmental Risks and Opportunities** Environmental risks and opportunities associated with activities, products and services of the project will be identified, recorded and tracked in the Project Environmental Risk and Opportunity Register. The Environmental Risk and Opportunity Register is an excel Spreadsheet contained in the Project Management System. Any environmental risks identified as critical will also be captured and monitored via the Project Risk Register contained in ARM. Environmental risks and opportunities are considered during all subsequent project risk assessments as per the Project Management Plan. This includes: ▪ The Principal Risk Assessment conducted at bid stage for major tangible risks. ▪ Safety/Environment-in-Design workshops conducted throughout the Project ▪ Construction Area Plan (CAP) risk assessments ▪ Work Pack risk assessments ▪ Project Prestart Meeting The Environment Representative is involved in the Principle Risk Assessment and Safety/Environment-in-Design workshops and has approval authorities for all other risk assessment types (except for START/Restart Cards) to ensure environmental risks and opportunities are adequately raised and addressed.	**Project Manager** Project Environmental Representative Design Manager Engineers Supervisors	Environmental Risk and Opportunity Register Construction Area Plan risk assessments Project Prestart Meeting
	Start-up workshop: The start-up workshop is held to encourage the parties and others concerned with the Works to work co-operatively towards achieving a successful Contract. Start-up workshop guidance material is provided at Attachment 1 and does not form part of the Contract. 1) The Principal shall convene a start-up workshop within 28 days after the Date of Contract or such other period as the parties agree. 2) The parties must attend the start-up workshop and must jointly decide who else will attend. Clause 6.4 applies to the costs of the workshop. 3) The objective of the start-up workshop is to promote a culture of co-operation and teamwork for the management of the Contract. The parties agree to conduct the workshop collaboratively to achieve this objective.	**Project Manager** Project Environmental Representative Design Manager Engineers Supervisors	Environmental Risk and Opportunity Register
4.2 Identified risks and opportunities are analysed and evaluated according to agreed criteria and recorded in a risk register	**Analysing Environmental Risks and Opportunities** Each environmental risk and opportunity will be evaluated and assigned a rating which is determined using the consequence and likelihood criteria in the Risk Management Procedure. The influence of existing controls is considered in determining the risk rating.	**Project Manager** Risk owners Project Environmental Representative Engineers	Environmental Risk and Opportunity Register Work Area Plan risk assessments Project Prestart Meeting

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	For each environmental risk: ▪ An owner is assigned by the Project Manager, ▪ Existing controls are recorded, including the owner of that control, and ▪ The residual risk will be evaluated. Opportunities will be assessed to determine whether they can be implemented on the project and be based on a cost-benefit business case for the opportunity. Advice is sought from the Project Environmental Representative as necessary by the project team to ensure CAP, Work Pack and SEP risk assessments are as informed and accurate as possible.		
4.3 Environmental controls appropriate to the level of risk are identified, documented and implemented	**Identifying Adequate Controls** If the risk rating returns a result of 'medium' or above, then additional controls sufficient to reduce the risk rating to 'low' or an alternative acceptable level using cost effective designs and engineering and/or administrative controls are to be utilised. Residual risks with a high or extreme risk rating will be considered 'significant' and must be controlled using appropriate systems of work, including Environmental Sub-Plans and project work procedure, along with available "hard controls". Approval to proceed is required prior to commencing Accountability for the implementation of each control is assigned in the respective Sub plan and SEPs and a due date set for its implementation as appropriate. Controls are selected in consultation with the Project Environmental Representative to achieve the following, in order of preference: ▪ Eliminate the risk by not performing the relevant activity ▪ Substitute by performing the relevant activity in a way that presents a lower risk ▪ Implement physical (engineered) controls (e.g. sediment basins, check dams) ▪ Implement administrative controls (e.g. procedures, training, inspections).	**Risk owners** Project Environmental Representative Project Manager Project Engineers	Controls agreed (engineered or administrative)
	Implementing Controls Controls are implemented by the accountable person as specified in the Sub Plan or SEP by the due date. No activity is commenced until all relevant controls are implemented.	**Risk owners**	Controls in place (engineered or administrative)
4.4 Feasible opportunities are implemented	**Implementing Opportunities** Opportunities identified and for which a business case has been developed, are submitted to the appropriate member of the project leadership team for approval. Once approved, accountability for implementation of the opportunity is assigned and the opportunity is implemented. Environmental and cost benefits are recorded and reported in monthly reporting.	**Project Manager** Opportunity Owner	Monthly reports Case studies

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
4.5 Identified environmental risks and controls are communicated to all relevant personnel	**Communications in line with Construction Planning** The environmental risks, controls and accountabilities identified are communicated to all relevant personnel. This is achieved through the preparation and communication of the construction methodology, CAPs, Work Packs, SEPs, the conduct of Safety/Environment-in-Design workshops.	**Project Manager** Engineers Project Environmental Representative	Toolbox talk content and attendee records Pre-start meeting content Records of communications and meetings
	HSE Communications Environmental risks, controls and accountabilities are also communicated through delivery of HSE communications, including HSE Committee meetings, toolbox talks and pre-start meetings.	**Engineers** Supervisors Project Environmental Representative Project Manager Health and Safety Manager	Site induction content Toolbox talk content and attendee records Pre-start meeting content Records of communications and meetings
	Communication through Training Nominated administrative controls, including procedures and training, will be communicated through the delivery of training in their requirements	**Project Environmental Representative**	Site Induction Site Toolbox Talks and Pre-starts
4.6 Regular inspections and monitoring are conducted to check effectiveness of controls	**Inspections, Observations and Monitoring** The processes for inspections, observations and monitoring are described in Expectation 3 of this EMP and detailed in Appendix F.	**Project Environmental Representative** Project Manager Engineers Supervisors	Observation records Inspection schedules Inspection checklists Corrective actions in Synergy
4.7 Environmental risks and controls are regularly reviewed.	**Risk Review** The relevance and adequacy of environmental risks and controls identified in this EMP, the Principal Risk Assessment, CAP and Work Pack risk assessments are reviewed and updated according to Project Management Plan.	**Project Manager** Project Environmental Representative Engineers	Environmental Risk Register Updated risk registers in ARM, CAPs and Work Packs

Element 5: Change Management

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
5.1 Changes to planned operations that have potential environmental consequences are identified	**Identifying Change** Personnel promptly report any 'medium' or 'major' changes that could affect the environment and/or community A 'medium' or 'major' change could result from a change to design, plant (fixed and mobile), systems, personnel and work methods such that the absence of a considered review could compromise the project's ability to comply with its obligations and/or result in an inadequate range of controls which could lead to an incident or result in community nuisance. A 'medium' change is one which includes permanent changes to Work Pack methodology or work conditions. A 'major' change is one which is site-wide or requires a revision of CAP's. Personnel have received appropriate training to identify changes and apply change management processes. This includes all supervisory staff being informed of the need to have changes approved prior to commencing relevant works.	**Project Manager** Project Environmental Representative Engineering Manager Engineers Supervisors	Disruption Notice
5.2 Risks associated with identified changes are assessed and controlled before changes are implemented	**Risks Associated with Change** All proposed changes are documented, including the assessment of risks relating to the change. Key personnel affected by the change are involved in the risk assessment. All changes are requested or sponsored by a supervisor or manager, who then becomes the change owner. Input from environmental personnel is sought as necessary. The approach to risk assessment and the implementation of controls will follow the requirements of Element 4 of the EMP.	**Project Manager** Change owner Supervisors Project Environmental Representative	Disruption Notice
5.3 All changes with environmental consequences are authorised before they are implemented	**Approvals of Change** All change requests are approved by the supervisor or manager of the change owner, or as otherwise required by the project delegations, before any relevant work commences and a record is maintained. This must include any approvals associated with revised WAPs and Work Packs by the Project Environmental Representative.	**Project Manager** Construction Manager Engineering Manager Project Environmental Representative	Disruption Notice
5.4 Controls associated with change are communicated to all affected personnel	**Communication of Change** Affected personnel will be consulted and understand the effects of change before the relevant works commence. This is achieved through toolbox talks, daily pre-start meeting, HSE committees or forums arranged to specifically address changes.	**Change Owner** Supervisors	Toolbox talk material Pre-start meetings Attendance records Meeting minutes

Element 6: Communication and Consultation

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
6.1 External environmental stakeholders are identified	**Identifying External Stakeholders** A comprehensive stakeholder analysis will be performed to identify external stakeholders and their interests in the environmental management of the Project. This will include community members and others who could be affected by the Project works, as well as government and environmental lobby groups. The Environment Representative will be involved in the analysis process. The Community Communication Strategy, as approved by the Planning Secretary, must be implemented for a minimum of 12 months following the completion of construction.	**NSW Health Infrastructure responsibility**	Stakeholder register or database Stakeholder Analysis
6.2 Relationships with external stakeholders are effectively managed	**Managing Relationships** Activities performed to effectively manage relationships with external stakeholders include: ▪ Identifying environmental risks that relate to stakeholder interests by considering the impacts to stakeholders (documented in Environmental Risk Register) ▪ Determining suitable controls and activities to mitigate risks (general controls and activities documented in Environmental Risk Register, details in Environmental Sub-Plans, CAPs, and Work Packs). ▪ Performing inspections, audits, stakeholder engagement and monitoring activities to assess the effectiveness of controls Actively engaging stakeholders through open communication and involvement. A site notice(s): (a) must be prominently displayed at the boundaries of the site for the purposes of informing the public of project details including, but not limited to the details of the Builder, Certifying Authority and Structural Engineer. (b) is to satisfy all but not be limited to, the following requirements: (i) minimum dimensions of the notice must measure 841 mm x 594 mm (A1) with any text on the notice to be a minimum of 30-point type size; (ii) the notice is to be durable and weatherproof and is to be displayed throughout the works period; (iii) the approved hours of work, the name of the site/ project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries, including construction/ noise complaint must be displayed on the site notice; and (iv) the notice(s) is to be mounted at eye level on the perimeter hoardings/fencing and is to state that unauthorised entry to the site is not permitted.	**Project Environmental Representative** Project Manager	Environmental Risk Register Risk assessments in CAPs, Work Packs, Environmental Sub-Plans and Procedures Audit reports Monitoring results Communications material Forums and opportunities for stakeholder engagement

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	A Community Communication Strategy must be prepared to provide mechanisms to facilitate communication between CPB Contractors, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction. The Community Communication Strategy must: (a) identify people to be consulted during the design and construction phases; (b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development; (c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development; (d) set out procedures and mechanisms: (i) through which the community can discuss or provide feedback (ii) through which CPB Contractors will respond to enquiries or feedback from the community; and (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation. The Community Communication Strategy must be submitted to the Planning Secretary for approval no later than two weeks before the commencement of any work. Work for the purposes of the development must not commence until the Community Communication Strategy has been approved by the Planning Secretary, or within another timeframe agreed with the Planning Secretary.		
6.3 Internal consultative forums are established with regular meetings scheduled, conducted, documented and communicated	**Consultative Forums** A schedule of communication forums will be developed which includes: ▪ Managers' meetings that are to address environmental matters at least monthly; ▪ Environmental Toolbox Talks ▪ Pre-start meetings prior to commencing a shift; The Project Manager will establish appropriate environmental interfaces with the client and regulatory bodies. Records will be kept of all HSE communication activities (e.g. attendance records). The effectiveness of the meeting outcomes will be reviewed as required.	**Project Manager** Project Environmental Representative H&S Manager	Minutes of meetings Toolbox Talks Pre-Start meetings Attendance records

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
6.4 Environmental complaints and enquiries are recorded and responded to appropriately	**Actions from Consultative Forums** Actions arising from consultative forums are assigned and communicated to a responsible person and confirmed as being completed. The Project will identify, track and complete environmental related actions using Synergy – Action Plans Module.	**Community & Stakeholder Liaison** Project Environmental Representative	Synergy – Action Plans Module
	HSE Signs and Notice Boards Dedicated HSE notice boards will be prominently located and maintained with current environmental information.	**Project Environmental Representative**	Signs and notice boards installed with current environmental content
	Responding to Complaints and Enquiries All environmental related complaints will be classified according to the Incident Classification Matrix and recorded in Synergy. Complaints are treated as an incident and managed according to Element 9 of the EMP. Corrective actions are agreed and implemented, with accountabilities and time frames assigned. The complainant or enquirer is notified of the intended Project response once approved by the Project Manager.	**Community & Stakeholder Manager** Project Environmental Representative Project Manager	Incident records Records of communications
	Changes to Environmental Monitoring Environmental monitoring programs will be reviewed to address matters raised through valid complaints and consultations with stakeholders. Amendments to the monitoring program will be adequate to allow early identification of conditions that are likely to result in further complaints and/or exceedances. Data will be analysed to identify actual and potential impacts to the community, and corrective actions implemented.	**Project Environmental Representative** Community & Stakeholder Manager	Monitoring schedule Monitoring records Corrective actions in Synergy
	Client and Internal Notifications The Business Unit Environment Manager and Corporate Communications Manager are notified of complaints that have or are likely to generate media interest. The client is notified according to the conditions outlined in the Contract.	**Project Manager**	Record of communication

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
6.5 The effectiveness of internal and external stakeholder engagement is evaluated and improved.	**Evaluation of Internal and External Communications** The effectiveness of internal communication and consultation activities will be formally reviewed as required. The effectiveness of external communication and consultation activities will be formally reviewed as required. The Project Environmental Representative participates in both reviews, which are led by the Project Manager and include the Community and Stakeholder Manager and Health and Safety Manager. The Project Environmental Representative will also regularly attend and review the effectiveness of forums and recommend changes to the scheduling or style of forum.	**Project Manager** Community & Stakeholder Manager Project Environmental Representative H&S Manager	Meeting minutes

Element 7: Training and Competency

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
7.1 All personnel have completed an induction containing relevant environmental information before they are authorised to work on the Project	**Inductions** All personnel, subcontractors and visitors will undergo an induction before commencing work on-site. The induction addresses general and Project-specific environmental issues, including: ▪ CPB Contractors' environmental policy ▪ How the EMP will be implemented on-site ▪ High-risk environmental activities on the Project and their controls ▪ What to do in the event of an environmental incident. An assessment will be conducted upon completion of the induction. Induction materials are reviewed at least annually and amended to reflect changes to Project environmental risks, the status of community relations and the occurrence of incidents.	**Project Environmental Representative** Health and Safety Manager	Induction materials Training attendance records Completed induction assessments
7.2 A training plan is developed and documented	**Identifying Training Needs** Environmental training needs required to deliver this EMP are identified and documented within the Project's training matrix. In populating the training matrix, the environmental training requirements for each role are addressed, including competency, needs and capability. The Project Environmental Representative will contribute to the development of the training matrix. The performance and development management process provide an opportunity to identify and plan the delivery of training needs not provided in the training matrix, or that are necessary to aid in the development of the individual. Subcontractor training and competency responsibilities will be included in subcontractor agreements.	**Environment Representative** P&C Manager	Performance and Development management plans Subcontractor agreements Subcontractor Start-Up Meeting minutes
	Scheduling Training Needs A project training schedule will be developed to plan the delivery of training needs identified in the training matrix. Refresher training intervals will also be stated where applicable.	**P&C Manager** Project Environmental Representative	Training schedule Training records

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
7.3 Personnel are trained and assessed according to the training plan	**Provide Training Resources** All resources to deliver the training schedule, including personnel, equipment, funding and materials, will be allowed for in the Project budget.	**Project Manager** Project Environmental Representative	Project budget
	Delivery of Training All training identified in the training matrix will be delivered according to the training schedule. Training and development needs identified through the performance and development process will be achieved as per time frames nominated in individual plans. Personnel delivering environmental training must be deemed competent by the Project Environmental Representative or Business Unit Environment Manager.	**Project Manager** P&C Manager Project Environment Representative	Training records
	Training Evaluation and Review Training assessments and evaluation forms will be used to assess the effectiveness of training. Training evaluation and feedback will be reviewed and used to improve the quality of environmental training delivered on the Project. The training matrix and schedule will be completely reviewed at least annually or prior to the commencement of major new tasks.	**P&C Manager** Project Environmental Representative	Training evaluation forms Training matrix
7.4 Training records are maintained and accessible to relevant personnel.	**Training Records** Records of all training activities, including inductions, will be maintained. Records will include the name and role of the attendee, the name of the course and, where applicable, reference to the document-controlled version of the material presented, and a copy of the assessment completed.	**P&C Manager** Project Environmental Representative	Training records

Element 8: Subcontractor Relationships

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
8.1 Selection processes ensure that subcontractors meet CPB Contractors' minimum environmental requirements	**Subcontractor Selection and Engagement** Subcontractors engaged on the project are required to undergo a thorough assessment prior to selection. The Project Environmental Representative will be consulted on environmental requirements of subcontracts and the adequacy of proposed conditions. Subcontractors will be made aware of CPB Contractors' environmental requirements during the tender process and Start-Up meetings.	**Commercial Manager** Engineers Project Environmental Representative	Subcontractor Agreements
8.2 Planning requirements of all subcontractor work scopes are completed and communicated prior to commencing work	**Identify, Complete and Communicate Planning Requirements and Documentation** The scope of work to be performed by each subcontractor is reviewed to determine whether it includes works for which project planning and environmental risk assessments have been completed. If so, the subcontractor is formally informed of all relevant risks and existing project documents, systems and procedures to be followed prior to commencing works (in addition to having been informed of these during the tendering process). These may include the contents of the construction methodology, CAPs, Work Packs, SEPs, and Environmental Sub-Plans in this EMP. If the scope of works includes activities not already addressed in Project planning and risk assessment, then an appropriate risk assessment is performed and either existing documentation is revised, or new documentation produced. The Project Environmental Representative should review this new documentation to ensure it meets project requirements. In either case, the subcontractor must be formally informed of all requirements prior to commencing works.	**Engineers** Project Environmental Representative Commercial Manager	Construction Area Plans (CAPs) Work Packs SEPs Records of subcontractor notification
8.3 Compliance requirements for high risk environmental activities are identified and enforced	**Compliance requirements** For high risk environmental activities, the Project Environmental Representative will review the subcontractor's scope of works with the supervising Engineer and: ▪ Identify any new issues relevant to the subcontractor's scope of works; ▪ Identify any additional compliance requirement not captured; ▪ Identify necessary approvals not already in place and obtain those approvals prior to any works commencing; ▪ Update the relevant Environmental Sub-Plans, SEPs, and compliance monitoring and reporting program with details new approvals and their conditions. The Project Environmental Representative will review the CAP and Work Packs, for high risk environmental issues. The subcontractor will be informed of all relevant environmental issues/risks and controls, procedures and documents to be followed and implemented in order to	**Engineers** Project Environmental Representative Commercial Manager	Records of subcontractor notification

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	achieve compliance during the tendering process. This will be reinforced during the Start-Up meeting. The subcontractor will be informed of the requirement to provide all relevant data relating to their works as per the National Greenhouse and Energy Reporting Act 2007 (Cth).		
8.4 Subcontractor documentation is submitted and reviewed to meet Project requirements	**Documentation Preparation and Review** The subcontractor will provide CPB Contractors with all required environmental documentation prior to commencing work on the Project as described in the executed agreement, including any requirement to produce an Environmental Management Plan. Any further requirements will be agreed by the Commercial Manager and the Project Environmental Representative.	**Project Environmental Representative** Engineer Commercial Manager	Subcontractor environmental documentation
8.5 Changes to the scope of work are managed as a Project change	**Manage Changes/Variations** Changes and variations to subcontractor scopes of work will be assessed as a change according to the requirements of Element 5 of the EMP. Documentation will be amended accordingly.	**Commercial Manager** Engineers	Change Requests
8.6 Subcontractors actively participate in environmental management and training on the Project	**Subcontractor Environmental Participation** Subcontractors will participate in HSE communication forums and monitoring activities, as a minimum, including: ▪ Project induction; ▪ Scheduled HSE management meetings, toolbox talks, pre-start meetings, HSE committees (as required); ▪ HSE observations, inspections and audits; ▪ Incident investigations (as required); ▪ Development or review of safe work systems SEPs (as required).	**Commercial Manager** Project Environmental Representative Subcontractors Engineers	Attendance records Monitoring records

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	Subcontractor Training Subcontractors will undergo all necessary environmental training including any required by the Project. The required training will be determined by reviewing the training matrix relative to the scope of work and roles being filled or supplied by the subcontractor. The delivery and management of training will be as per Element 7 of the EMP.	**Subcontractor** Project Environmental Representative	Subcontractor training records
8.7 Subcontractors are reviewed to assess their performance and compliance with our minimum environmental requirements.	**Subcontractor Audits and Reviews** Subcontractors will be regularly inspected and observed for environmental performance as per Element 3.4 of this EMP.	**Project Environmental Representative** Engineers Supervisors	Audit reports Inspection and monitoring records

Element 9: Incident Management

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
9.1 All incidents are followed by appropriate response and notification	**Incident Response** The immediate response to all incidents is to make the area safe and undertake measures to prevent further environmental harm. An assessment will be made in consultation with the Project Environmental Representative to ensure that responses do not result in further harm. **Initial Incident Notification** The Project Manager and Project Environmental Representative are to be notified immediately of the following incidents: All Level 1 and Level 2 environmental incidents, and PL1 and PL2. The Project Environmental Representative is also to be notified of any actual Class 3 environmental incident, procedural or legal breach. For Level 1 and Level 2 incidents and PL1 and PL2, the Project Manager will immediately notify the Business Unit General Manager and the Business Unit Environment Manager. The Project Manager will also notify the Business Unit General Manager of the need to activate the Project's Emergency Response Procedure and the Group Crisis Management Plan if necessary. The client is notified of all environmental incidents as per the agreed contractual arrangements. Environmental incidents will be reported to regulators in accordance with the requirements of local, state and federal government regulations. The Department must be notified in writing to compliance@planning.nsw.gov.au immediately after the Applicant becomes aware of an incident. A written incident notification addressing the requirements set out below must be emailed to the Department at compliance@planning.nsw.gov.au within seven days of becoming aware of an incident. Notification is required to be given under this condition even if it is subsequently considered that an incident has not occurred. Written notification of an incident must: a. identify the development and application number; b. provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident); c. identify how the incident was detected; d. identify when the applicant became aware of the incident; e. identify any actual or potential non-compliance with conditions of consent; f. describe what immediate steps were taken in relation to the incident; g. identify further action(s) that will be taken in relation to the incident; and	**Project Manager** Project Environmental Representative Community & Stakeholder Manager Engineers Supervisors	Records of incident notifications

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	h. identify a project contact for further communication regarding the incident. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, a detailed report on the incident addressing all requirements below is to be provided to the Planning Secretary and relevant authorities, and such further reports as may be requested. The Incident Report must include: a. a summary of the incident; b. outcomes of an incident investigation, including identification of the cause of the incident; c. details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and d. details of any communication with other stakeholders regarding the incident. **Preserve the Incident Scene** Scenes of environmental Level 1 and 2 incidents and PL1's is to be preserved until the incident investigation team has collected relevant data and evidence (see below).		
9.2 All incidents are entered and managed in Synergy	**Incident Classification and Reporting** Environmental incidents will be classified using the Incident Classification Matrix by the Project Environmental Representative in consultation with the Project Manager. All environmental incidents, including community complaints, will be reported using the Synergy within three calendar days. Root causes will be identified and recorded in Synergy for all Class 1, 2 incidents and HPIs (and optionally for Class 3 incidents). All statutory notices received from regulators, including penalty notices and fines, will be entered as Environmental Legal Issue incidents upon receipt.	**Project Environmental Representative** Project Manager	Incident records Root cause coding
9.3 Incident investigations are conducted appropriate to the type of incident	**Project Incident Investigations** All incidents will be investigated according to company procedures. The level of investigation needed will depend on the incident classification. Corrective actions, including those required to help prevent future incident occurrences, are a key outcome of incident investigations. Incident investigation reports are to be uploaded to Synergy. **Statutory Authority Investigations** Before any staff member is questioned by officers of a statutory authority, they will endeavour to consult the Project Manager to determine whether Legal Counsel is needed.	**Project Manager** Project Environmental Representative Supervisors Engineers	Incident investigation reports

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	Regulatory inspectors must be given appropriate assistance during their own investigations.		
9.4 All personnel conducting incident investigations are trained to competently perform the task	**Incident Investigation Teams Competent and Trained** The selection of the investigation team will be up to the Project Manager and will depend upon the severity of the incident, and the availability of experienced personnel. However, the investigation team does need to have a mix of both Operational and HSE Staff. The following should be considered when selecting an investigation team: ▪ Statutory requirements; ▪ CPB Contractors Corporate requirements; ▪ Technical specialists with an understanding of the work process; ▪ Administrative Support; ▪ Mix of skills and experience; ▪ Potential conflict of interest for any proposed member.	**Project Manager**	Incident investigation reports
9.5 Corrective and preventive actions are taken after incidents and lessons are shared with other projects	**Corrective and Preventive Actions** Following an incident, corrective and preventive actions will be identified, assigned to the appropriate person/s and closed out according to set time frames. Time frames are set to ensure damage incurred is rectified and any chance of recurrence is eliminated as soon as practicable. Synergy will be used to assign and track corrective actions. All corrective actions will include reference to the relevant incident record for ease of tracking.	**Project Manager** Project Environmental Representative	Corrective action records on Synergy
	HSE Alerts HSE Alerts will be submitted for all Class 1 and 2 incidents and HPIs to the Project Manager and Business Unit Environment Manager for distribution outside of the project team. HSE Alerts will also be raised for all other incident types at the discretion of the Project Environmental Representative, Project Manager or Business Unit Environment Manager.	**Project Environmental Representative** Project Manager	HSE Alerts
9.6 High potential and repeat incidents are regularly reviewed by the project management team	Each month the Project Environmental Representative will, as a minimum, identify trends in incidents (as a minimum, all Class 1 and 2 incidents and HPIs) and trends in root causes to suggest the nature of preventative actions which are warranted. The Project Manager will approve actions to address incident occurrences and incident and root cause trends. Actions will be managed using the Synergy.	**Project Environmental Representative** Project Manager	Monthly project reports Corrective actions

Element 10: Emergency Planning and Response

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
10.1 Potential emergencies are identified using a formal risk assessment process	**Identifying Potential Emergencies** Risk assessments conducted in accordance with Element 4 of the EMP are used to identify potential emergencies on the Project. Activities found to have an environmental consequence of 4 or 5 as per the definitions for environmental consequence contained within the CPB Contractors Risk Management Protocol will be considered potential emergencies.	**Project Manager** Project Environmental Representative	Environmental Risk Register Principal Risk Assessment
10.2 Emergency response plans and procedures are developed and regularly reviewed	**Emergency Response Plan** An Emergency Response Plan that addresses all identified potential environmental emergencies with specific emergency procedures for each different potential emergency will be developed. The plan will address or include the following: ▪ Nominated and trained emergency coordinator and emergency wardens ▪ Explanation of communications to be performed during an emergency ▪ Explanation of what a crisis is as compared to an emergency and what to do in the event of a crisis ▪ The details of emergency services contacts ▪ Emergency assembly locations ▪ A detailed location map showing the site in relation to local public roads ▪ A detailed site layout diagram ▪ Information about personnel and facilities available to help emergency services ▪ Specific emergency procedures for each potential emergency identified that aim to protect human health and environmental values, including assessment of resources required to respond to that emergency ▪ Post-emergency actions. The Emergency Response Plan will be updated at least annually or when there are significant changes to project activities or in response to revised and new risk assessments.	**Project Manager** Project Environmental Representative H&S Manager	Emergency Response Plan and procedures
10.3 Adequate resources are provided to effectively implement emergency response plans and procedures	**Emergency Response Plans Adequately Resourced** Resources required to implement the Emergency Response Plan will be available on the Project and be maintained. Necessary resources include but are not limited to: ▪ An emergency coordinator and emergency wardens; ▪ Spill response kits; ▪ Firefighting equipment; ▪ Barricading; ▪ Vehicles.	**Project Manager** Project Environmental Representative H&S Manager	Project resources for Emergency Response Plan and procedures

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
10.4 Environmental emergency response drills are conducted	**Environmental Emergency Response Drills** Environmental emergency response drills will be conducted as required. The emergency scenario of the drills will be rotated to avoid repetition and be relevant to the activities occurring at the time. Records will be kept of the results for all drills. Where testing and evaluation shows a deficiency in either emergency preparations or the Emergency Response Plan, appropriate corrective and preventive actions are taken and raised and managed using Synergy.	**Project Manager** Project Environmental Representative Health and Safety Manager	Emergency response drill records Corrective action records in Synergy
10.5 Employees, contractors and visitors are given appropriate emergency response training.	**Emergency Training** Emergency coordinators and wardens are trained to implement the emergency response plans. Specific training requirements will be identified and captured within the training matrix and will be delivered according to company procedures. Visitors are informed of requirements during the visitors' induction. **General Workforce Training and Awareness** All personnel and subcontractors will receive training to inform them of their roles and responsibilities in the event of an emergency. This training and awareness will be provided during Project induction.	**P&C Manager** Project Environmental Representative Health and Safety Manager	Training matrix Training schedule Training and induction records

Element 11: Document and Record Management

Expectations	How we will meet the Expectations (minimum requirements)	Responsibilities Key Contributor	Deliverables
11.1 Current versions of all relevant documents and records are available and controlled.	The Project must ensure that all documents and records referred to and required to implement the EMP, including the plan are controlled and maintained according to CPB Contractors requirements. This includes but is not limited to all: ▪ Management plans and Procedures ▪ Knowledge and Tools ▪ Templates (e.g. audit template, training matrix) ▪ All electronic records saved in electronic databases such as Synergy, ChemAlert etc. **Document Types** The types of records to be generated on the Project that are to be stored and maintained include: ▪ Environmental monitoring results - 30 years from the date of any incident or completion of the Project, whichever is later ▪ Complaints and enquiries received - 7 years from completion of the Project ▪ Notifications received by regulators - 30 years after the completion of the project ▪ Audit reports - 7 years from completion of the Project ▪ Completed inspections and observations - 30 years from the creation of the record ▪ Waste tracking certificates - 7 years from the creation of the record ▪ Training records - 7 years from the end of the employee's employment ▪ Incident reports - 30 years from the creation of the record ▪ Calibration records for monitoring equipment ▪ Monthly reports and Meeting minutes - 7 years from completion of the Project or from the date on which work was last performed on the Project ▪ Records as required under the National Greenhouse and Energy Reporting Act 2007 - 7 years from the creation of the record ▪ HSE Alerts Any editing and access restrictions to environmental documents and records and who has authority to dispose of nominated documents and records comprise: ▪ Project Environmental Representative to authorise the disposal of any environmental documents or records.	**Project Environmental Representative** Project Manager	Controlled and maintained documents and records
11.2 Relevant documents and records will be maintained using corporate business applications and systems	Relevant environmental documents and records generated on the Project will be stored and managed using Incite with the following exceptions: ▪ Environmental monitoring data will be managed and stored using the Project drive	**Project Manager**	Controlled and maintained documents and records

Expectations	How we will meet the Expectations (minimum requirements)	Responsibilities Key Contributor	Deliverables
	▪ Whole of CPB Contractors environmental performance data will be managed and stored in JDE, including Water, Waste and Energy and Greenhouse Gases ▪ Incident reports and corrective actions will be stored and managed using Synergy ▪ Risk registers will be retained in excel spreadsheet.		

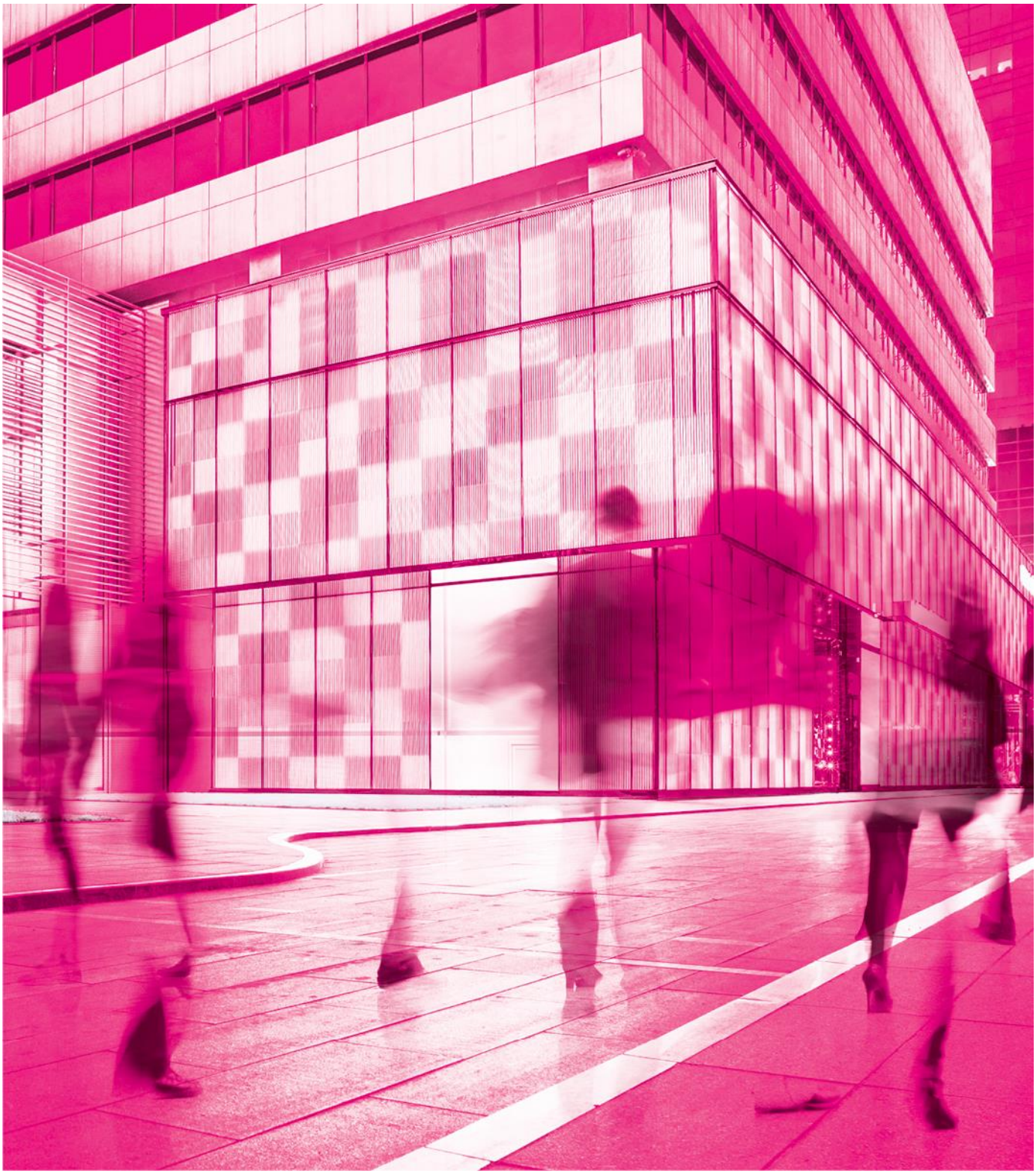
Element 12: Auditing, Review and Improvement

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
12.1 Environmental performance trends are identified and corrective actions are implemented as required	**Performance Trends** Environmental performance will be reviewed and reported at least monthly to identify trends. Performance will be assessed against both lead and lag measures and relative to specific targets agreed as per Expectation 1.3 of the EMP, and in the sub-plans in Part C. Action plans will be developed to improve performance as required, corrective and preventative actions will be managed using the Synergy – Action Plan Module.	**Project Manager** Project Environmental Representative	Monthly reports Corrective and Preventative actions in Synergy – Action Plan Module
12.2 A monthly environmental report is produced and distributed	**Monthly Reporting** A monthly environment report will be prepared for the Project Manager for inclusion in the monthly project report. This report will include the following: ▪ Analysis of performance against project, business unit and corporate environmental targets as per Section 3 Part A of this EMP ▪ Analysis of performance against targets set in the Environmental Sub-Plans, including monitoring results ▪ Details of each environmental incident on the project for that period including actions taken and outstanding ▪ Confirmation that the EMP is compliant with the CPB Contractors EMS by referring to the number and results of inspections, audits, observations and monitoring ▪ Confirmation that the NGER procedure has been implemented during the month ▪ Any environmental innovations implemented on the project	**Project Environmental Representative**	Monthly environment report
	The Monthly HSE Statistical Report in Synergy will be completed and approved by the Project Manager. This includes reporting on the currency of the EMP, compliance with the EMP and issues and initiatives arising during the period	**Project Manager**	Monthly HSE Statistical Report
12.3 Regular management reviews are conducted to determine the continuing suitability, adequacy and effectiveness of the Environmental Management System	The Project must conduct formal management reviews to assess the adequacy of the Environmental Management System as part of its annual management system reviews. The outputs of the review will be incorporated into the EMP. That review must consider the results of: ▪ Audits undertaken; ▪ Communication, participation and consultation; ▪ Relevant communication including complaints from external stakeholders; ▪ The perform of the Project; ▪ The extent to which the objectives and targets have been met; ▪ The outcomes of incident investigations and any corrective actions; ▪ Changes to legislation;	**Project Manager** Project Leadership Group Project Environmental Representative	Management review report Actions in Synergy

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
	▪ Actions from previous management reviews and recommendations for improvement.		
	The Department must be notified in writing to compliance@planning.nsw.gov.au within seven days after the Applicant becomes aware of any non-compliance. The Certifying Authority must also notify the Department in writing to compliance@planning.nsw.gov.au within seven days after they identify any non-compliance.	**Project Environmental Rep**	Non-compliance report
	Within three months of: (a) the submission of a compliance report under condition B40; (b) the submission of an incident report under condition C46; (c) the submission of an Independent Audit under condition C43; (d) the approval of any modification of the conditions of this consent; or (e) the issue of a direction of the Planning Secretary under condition A2 which requires a review, the strategies, plans and programs required under this consent must be reviewed, and the Department and the Certifying Authority must be notified in writing that a review is being carried out.	**Project Environmental Rep**	Documented review of strategies
12.4 Audits are undertaken to ensure compliance with the requirements of the EMP	**Compliance with Environmental Management Plan** Regular audits, in accordance with Division 9.4 of Part 9 of the EP&A Act, and reviews will be conducted to confirm compliance with the EMP and associated Obligations. A schedule of audits and reviews will be developed and maintained, and may include: Project planning/Start Up reviews (conducted by Business Unit HSE Manager or delegate) ▪ Project mobilisation audits (conducted by Business Unit HSE Manager or delegate) ▪ Subcontractor audits (for subcontractors performing high risk activities) ▪ High-risk activity audits ▪ Environmental Management Plan audits (conducted by Business Unit Environment Manager or delegate) ▪ Compliance and Legislative audits (conducted by BUEM or competent 3rd party). Action plans will be developed to improve performance as required. Necessary corrective actions will be managed using Synergy.	**Project Manager** Business Unit Environmental Management Representative Business Unit HSE Manager	Audit reports Corrective actions in Synergy
	Auditor Competency	**Business Unit Environmental**	Training records

Expectations	How we will meet the Expectations (minimum requirements)	Responsible Key Contributor	Deliverables
12.5 All audits are undertaken by suitably qualified and experienced personnel	Persons conducting audits and reviews will be suitably experienced and qualified. There are two levels of internal auditor that can be obtained, these being Auditor and Lead Auditor. A mix of general education, specific auditor training and work experience are considered in determining the level of auditor. Auditors must be approved by the Business Unit Environment Manager.	**Management Representative**	
	The proposed independent auditors must be agreed to in writing by the Planning Secretary prior to the preparation of an Independent Audit Program or commencement of an Independent Audit.	**Business Unit Environmental Management Representative**	Written auditor certification and approval
	No later than four weeks before the date notified for the commencement of construction, an Independent Audit Program prepared in accordance with the Independent Audit Post Approval Requirements (Department 2018) must be submitted to the Department and the Certifying Authority.	**Business Unit Environmental Management Representative**	Independent audit program

6. Construction Traffic and Pedestrian Management Sub-Plan



CTPMSP;

Nepean Hospital and Integrated Ambulatory Services Redevelopment (Stage 1) - SSDA

For Health Infrastructure

16 July 2020

parking;
traffic;
civil design;
communication;

ptc.

Document Control

Our Reference: T2-2271, Nepean Hospital and Integrated Ambulatory Services Redevelopment – Concept and Stage 1 SSDA, Construction Traffic Management Plan (CTMP)

Issue	Date	Issue Details	Author	Reviewed
1	14/12/17	Draft Issue	HL	AU
2	15/12/17	Final Issue	HL	AU
3	18/12/17	Final Issue (Revised)	HL	AU
4	06/04/18	Minor Edits	AM	AM
5	26/04/18	Final Issue (Revised)	HL	AU
6	20/07/18	Includes SEARs Table	AM	AM
7	06/11/18	Final Issue (Revised Section 7.6, Section 7.9 and Section 7.10)	KB	AU
8	09/11/18	Final Issue (Revised Section 5 and Section 7.15)	KB	AU
9	09/11/18	Final Issue (Revised construction staging plans and Section 7.15	KB	AU
10	13/11/18	Final Issue (Revised Section 5.1 and Section 7.5)	KB	AU
11	25/03/19	Draft Issue (SSDA conditions incorporated)	SC	AU
12	03/04/19	Final Issue (SSDA conditions incorporated)	SC	AU
13	05/04/19	Final Issue (SSDA conditions incorporated)	SC	AU
14	10/04/19	Final Issue (SSDA conditions incorporated)	SC	AU
15	02/04/20	Final Issue (Revised Section 1, Section 2.2 and Section 8	JM	DS
16	16/07/20	Final Issue (Revised Section 8.4.1 and Section 8.10)	CNL	SW

Contact

Andrew Morse
+61 2 8920 0800
+61 414 618 002
Andrew.morse@ptcconsultants.co

Steve Wellman
+61 2 8920 0800
+61 421 810 979
steve.wellman@ptcconsultants.co

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Executive Summary

The initial Construction Traffic Management (CTMP) Plan dated 13 November 2018 prepared by **ptc.** has been submitted to Department of Planning and Environment (DPE) as part of the State Significant Development Application (SSDA). As part of the SSDA approval, this Construction Traffic and Pedestrian Management Sub-
1. Plan (CTPMSP), or more commonly referred to as a Construction Traffic Management Plan (CTMP), has been updated to incorporate the construction traffic measures to improve site safety to the public and workers during the preconstruction and construction stages of the Stage 1 redevelopment of Nepean Hospital.

Stage 1 redevelopment involves the construction of a new main hospital building and associated public domain works. It is envisaged that the demolition, excavation and construction stages are anticipated to have minimal impact on the larger surrounding traffic network.

This CTMP has been updated to incorporate the construction traffic measures during the demolition and civil/structural works associated with the ambulance parking area adjacent to the new Stage 1 Tower Building.

The following are key points highlighted in this report:

- All works associated with the project will be restricted to the proposed time periods outlined in Section 8.2;
- Commercial trucks up to 19m articulated vehicles (AVs) and 'truck and dogs' will be utilised to complete the demolition, excavation and construction stages;
- All construction vehicles accessing and departing the subject site will be constrained to the State and Regional road network wherever practicable;
- All construction vehicles will be required to enter and exit the hospital property in a forward movement and will be performing their turning movements within the hospital boundary. In the event of an emergency or where a large vehicle cannot turn around within the confines of the site, a reverse manoeuvre to enter and exit the site can be performed at the direction of RMS accredited traffic controllers. The swept path analysis for a 19-meter articulated vehicle (AV) reversing manoeuvre entering and exiting the construction site is shown in Attachment 6
    - **Note:** Any adjustment to the CTMP should be developed in consultation with council and the contractor prior to being implemented onsite. A suitable Traffic Control Plan (TCP) will be required to be prepared by the appointed traffic management contractor.
- Due to the close proximity of train and bus services as well as site constraints, construction staff parking will not be provided on-site. The principal contractor will be encouraged to assist with the transportation of staff, and site personnel will be made aware of the available public transportation. Site personnel will also be encouraged to consider car-pooling;
- This report satisfies the following condition outlined within the Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning & Environment dated 20 November 2017:

    Traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport and cumulative

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impact of nearby construction projects, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact.

- This report addresses the SSDA Consent Conditions (B22, B27, B32, B36, B37, B38, C5, C6, C7, C8, C10 & C11) dated 25 February 2019, which are relevant to construction activities within the context of traffic and transport.

It is noted that this report will be continually reviewed and amended if required due to changes in design and/or RMS, Penrith City Council or any other authority requirements.

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SEARs and SSDA Conditions

This section outlines ptc.'s comments in relation to the relevant SEARs[1] and SSDA[2] conditions in relation to construction traffic and parking.

2. 2.1 SEARs

ptc. was engaged by Health Infrastructure (HI) to prepare a parking demand and traffic assessment report to accompany an SSDA for the construction of a hospital expansion within the existing Nepean Hospital campus.

This report has been prepared to address the traffic and transport related comments stated in Secretary's Environmental Assessment Requirements (SEARs) dated 22 November 2017 relating to the SSDA.

The following table presents the SEARs relevant to Transport and Accessibility and confirms that each of these items have been addressed in this report.

Table 1 – SEARs conditions and ptc. comments

SEARs	Comments and Reference
Item 5 – Transport and Accessibility	
• traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport and the cumulative impact of nearby construction projects, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact.	The traffic movements and truck routes associated with the construction process are described in Section 6 of this document, which should be read in conjunction with the construction methodology statement prepared by CPB Contractors.
Item 13 - Waste	
• Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.	The management of waste during the constriction process is described in the construction methodology statement prepared by CPB Contractors.

[1] Secretary's Environmental Assessment Requirements
[2] State Significant Development Application

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2.2 SSDA Conditions

This report is updated to address the traffic and transport related conditions within the SSDA Consent Conditions dated 25 February 2019.

The following table presents the SSDA Conditions relevant to traffic and parking, which confirms that each of these items have been addressed in this report.

Table 2 – SSDA conditions and ptc. comments

SSDA Condition	Comments and Reference
Part B – Prior to commencement of construction	
B22. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must address, but not limited to, the following:	See Section 8
a) be prepared by a suitably qualified and experienced person(s);	a) Completed by ptc.
b) be prepared in consultation with Council, RMS and TfNSW;	b) See Section 3
c) detail the measures that are to be implemented to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;	c) See Sections 8.6.2, 8.6.3 & 8.6.4
d) detail heavy vehicle routes, access and parking arrangements;	d) See Sections 6.1, 8.5 & 8.14
e) ensure all demolition and construction vehicles (excluding worker vehicles) are to be contained wholly within the Site and vehicles must enter the Site before stopping;	e) See Sections 8.3, 8.7, 8.11 & 8.13
f) include a Driver Code of Conduct to:	f) See Section 8.13
(i) minimise the impacts of earthworks and construction on the local and regional road network;	(i) See Section 8.13
(ii) minimise conflicts with other road users;	(i) See Section 8.13
(iii) minimise road traffic noise; and	(i) See Section 8.13
(iv) ensure truck drivers use specific routes;	(i) See Sections 8.5 & 8.13
g) include a program to monitor the effectiveness of these measures; and	g) See Section 8.20
h) if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.	h) See Sections 8.8 & 8.18
Construction Parking B27. Prior to the commencement of construction, the Applicant must provide sufficient parking facilities for heavy vehicles on-site (unless alternative parking is agreed to in writing from the relevant road authority) and ensure that construction traffic associated with the	See Sections 8.3, 0, 8.11, 8.13 & 8.15 8.14

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SSDA Condition	Comments and Reference
development minimises on-street parking or the use of public parking facilities.	
Construction and Demolition Waste Management B32. The Applicant must notify the RMS Traffic Management Centre of the truck route(s) to be followed by trucks transporting waste material from the site, prior to the commencement of the removal of any waste material from the site.	See Section 8.5.1 & Table 3
Roadworks and Access B36. Prior to the commencement of construction, the Applicant must submit design plans to the satisfaction of the relevant roads authority which demonstrate that the proposed accesses to the development are designed to accommodate the turning path of the largest vehicle accessing the site.	See Attachment 1
Car Parking and Service Vehicle Layout B37. Compliance with the following requirements must be submitted to the satisfaction of the Certifying Authority prior to the commencement of construction:	
a) all vehicles must enter and leave the Site in a forward direction. In the event of an emergency or where a large vehicle cannot turn around within the confines of the site, a reverse manoeuvre to enter and exit the site can be performed at the direction of RMS accredited traffic controllers. The swept path analysis for a 19-meter articulated vehicle (AV) reversing manoeuvre entering and exiting the construction site is shown in Attachment 6. **Note:** Any adjustment to the CTMP should be developed in consultation with council and the contractor prior to being implemented onsite. A suitable Traffic Control Plan (TCP) will be required to be prepared by the appointed traffic management contractor;	a) See Sections 8.5 & 8.13
b) minimum of 59 on-site car parking spaces for use during operation of the development and designed in accordance with the latest version of AS2890.1;	b) This will be addressed in due course.
c) the swept path of the longest vehicle entering and exiting the Site in association with the new work, as well as manoeuvrability through the Site, must be in accordance with AUSTROADS; and	c) See Attachment 1
d) the safety of vehicles and pedestrians accessing adjoining properties, where shared vehicle and pedestrian access occurs, is to be addressed.	d) See Section 8.18
Bicycle Parking and End-of-Trip Facilities B38. Compliance with the following requirements for secure bicycle parking and end-of-trip facilities must be submitted to the satisfaction of the Certifying Authority prior to the commencement of construction:	This condition will be addressed in due course.
a) the provision of a minimum 25 bicycle parking spaces;	
b) the layout, design and security of bicycle facilities must comply with the minimum requirements of AS 2890.3:2015 *Parking facilities - Bicycle parking*, and be located in easy to access, well-lit areas that incorporate passive surveillance;	

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SSDA Condition	Comments and Reference
c) the provision of end-of-trip facilities for staff in accordance with the ESD Design & As Built rating tool; d) appropriate pedestrian and cyclist advisory signs are to be provided; and e) all works/regulatory signposting associated with the proposed developments shall be at no cost to the relevant roads authority.	
Part C – During construction	
Construction Hours C5. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours: a) between 7am and 6pm, Mondays to Fridays inclusive; and b) between 7am and 5pm Saturdays. No work may be carried out on Sundays or public holidays.	See Section 8.2 a) See Section 8.2 b) See Section 8.2
C6. Activities may be undertaken outside of the hours in condition C5 if required: a) by the Police or a public authority for the delivery of vehicles, plant or materials; or b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or c) where the works are inaudible at the nearest sensitive receivers; or d) where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works.	See Section 8.2.1 a) See Section 8.2.1 b) See Section 8.2.1 c) See Section 8.2.1 d) See Section 8.2.1
C7. Notification of such activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards.	See Sections 8.8 & 8.18
C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours: a) 9am to 12pm, Monday to Friday; b) 2pm to 5pm Monday to Friday; and c) 9am to 12pm, Saturday.	See Section 8.2 a) See Section 8.2 b) See Section 8.2 c) See Section 8.2
Construction Traffic C10. All construction vehicles (excluding worker vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site before stopping, unless directed by traffic control.	See Sections 8.3, 8.7, 0, 8.11 & 8.13
Road Occupancy Licence C11. A Road Occupancy Licence must be obtained from the relevant road authority for any works that impact on traffic flows during construction activities.	See Section 8.11

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Authority Liaison

This CTPMSP has been prepared in consultation with Council, Roads and Maritime Services (RMS) and Transport for New South Wales (TfNSW); as required by the *SSDA Condition B32(b).* The following table summarised **ptc.**'s liaison with the relevant authorities in conjunction with the preparation of this report. The correspondence is included in this report as Attachment 2, Attachment 3 and Attachment 4.

3.

Table 3 – Summary of liaison between **ptc.** & relevant authorities

Authority	From (Contact)	To (Contact)	Date communicated	Method	Comments
Penrith City Council	Abdullah Uddin (Senior Traffic Engineer)	Hamish Dodson (Infrastructure Officer)	11/03/2019	Email	Comments requested from Penrith City Council in regards to the CTMP and the associated SSDA conditions. (See Attachment 2)
	Hamish Dodson (Infrastructure Officer)	Abdullah Uddin (Senior Traffic Engineer)	12/03/2019	Email	Council has previously reviewed the original CTMP where acceptance by Council officer is considered as consultation completed. There are no further comments from Penrith City Council. (See Attachment 2)
TfNSW	Abdullah Uddin (Senior Traffic Engineer)	Mark Ozinga (Principal Manager Land Use Planning & Development)	14/03/2019 / 22/03/2019	Email / Phone	Comments requested from TfNSW in regard to the CTMP and the associated SSDA conditions. (See Attachment 3)
	Mark Ozinga (Principal Manager Land Use Planning & Development)	Abdullah Uddin (Senior Traffic Engineer) (Senior Traffic Engineer)	22/03/2019	Email	TfNSW confirms that there is no need for them to provide comment on this occasion for the CTMP. (See Attachment 3)
	Abdullah Uddin (Senior Traffic Engineer)	Ken Ho (Transport Planner)	22/03/2019	Email	Comments requested from TfNSW in regard to the CTMP and the associated SSDA conditions. (See Attachment 3)
	Ken Ho (Transport Planner)	Abdullah Uddin (Senior Traffic Engineer)	22/03/2019	Email	No issues to raise by TfNSW upon review of the CTMP. (See Attachment 3)
RMS	Abdullah Uddin (Senior Traffic Engineer)	RMS	05/04/2019	Email/ phone	Comments requested from RMS in regard to the CTMP and the associated SSDA conditions. (See Attachment 4)

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Authority	From (Contact)	To (Contact)	Date communicated	Method	Comments
					Notwithstanding, it is noted that RMS has previously provided comments in relation to this hospital development in their letter dated 25 October 2018 (Ref: SYD17/01348/03 (A24580773)) and 4 December 2017 (Ref SYD17/01348 (A20098825)).
	Brana Ravichelvan (Network and Safety Officer West)	Abdullah Uddin (Senior Traffic Engineer)	08/04/2019	Email	RMS does not have any major concerns in regard to the CTMP and the associated SSDA conditions. However, they have requested that a TCP be provided once available. (See Attachment 4) It is noted that the TCP will be prepared by the proponent and will be submitted to relevant authorities in due course.
TMC	Abdullah Uddin (Senior Traffic Engineer)	Chris Goudanas & Isabel Malas (TMC)	25/03/2019	Email	TMC has been notified the truck routes to be followed transporting waste material from the site. (See Attachment 5)

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Introduction

In particular, this CTPMSP refers to the Early Works involving the demolition of the existing car parking facilities, excavation, piling and in-ground works and the construction of the Stage 1 Building.

4. This CTPMSP has been prepared in response to the SEARs and the SSDA Conditions to address the traffic management arrangements during the construction works.

The location of the subject site is outlined in Figure 1.

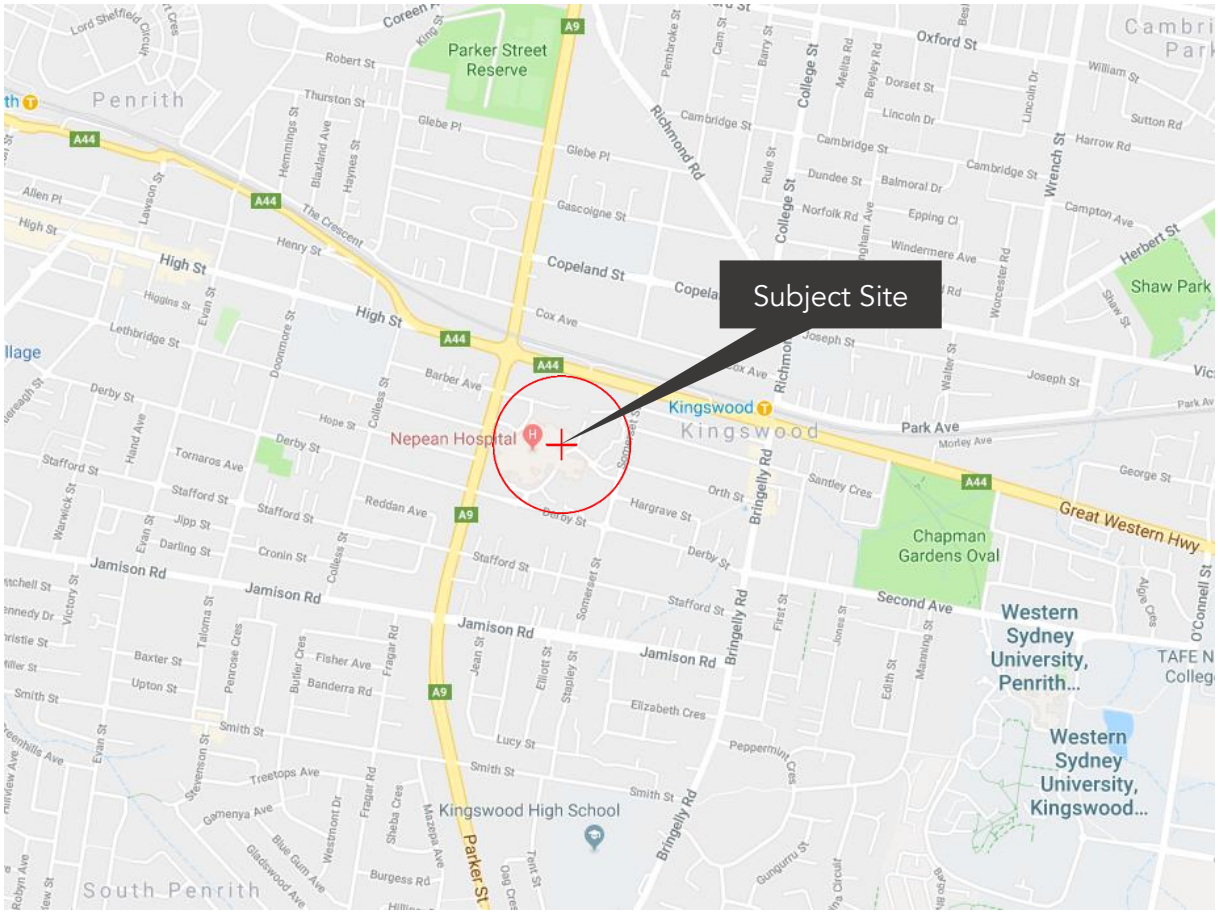

Figure 1 – Nepean Hospital Location (Source: Google Maps 2017)

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4.1 Purpose of this Report

This report has been prepared to outline the traffic management arrangements associated with the Stage 1 Building, Nepean Hospital Redevelopment.

This report presents the following considerations in relation to the construction traffic management plan:

Section 1 - Executive Summary;

Section 2 - SEARs & SSDA conditions;

Section 3 - Comments from authority liaison;

Section 4 - Introduction of the project;

Section 5 - Background information, including a description of the site and current use;

Section 6 - A description of the development proposal;

Section 7 - A description of the road network serving the development site, the existing transportation options and active transport facilities;

Section 8 - Management of construction vehicles and non-site traffic; and

Section 9 - Summary.

4.2 Department of Planning & Environment Condition

In accordance with Item 5 outlined within the SEARs issued by the Department of Planning and Environment (DPE), this report addresses the issues outlined below:

Traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport and cumulative impact of nearby construction projects, including the preparation of a Construction Traffic Management Plan to demonstrate the proposed management of the impact.

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Background

5.1 Site Context

The proposal relates to the following lot:

5. • Lot No. 1, DP1114090 (138,952m^2).

The site is located in Kingswood, which is approximately 60 km west of the Sydney CBD. Within the suburb, the Nepean Hospital is located approximately 3 km to the east of the Penrith City Centre. The Penrith City Centre hosts a population of approximately 198,000 within the Penrith Local Government Area (LGA), which has experienced growth of approximately 11.9% between 2006 and 2015 according to ABS Census Data. It is expected that this growth continues in the future.

The hospital is bounded by the Great Western Highway to the north, Parker Street to the west, Derby Street to the south and Somerset Street to the east (see Figure 2).

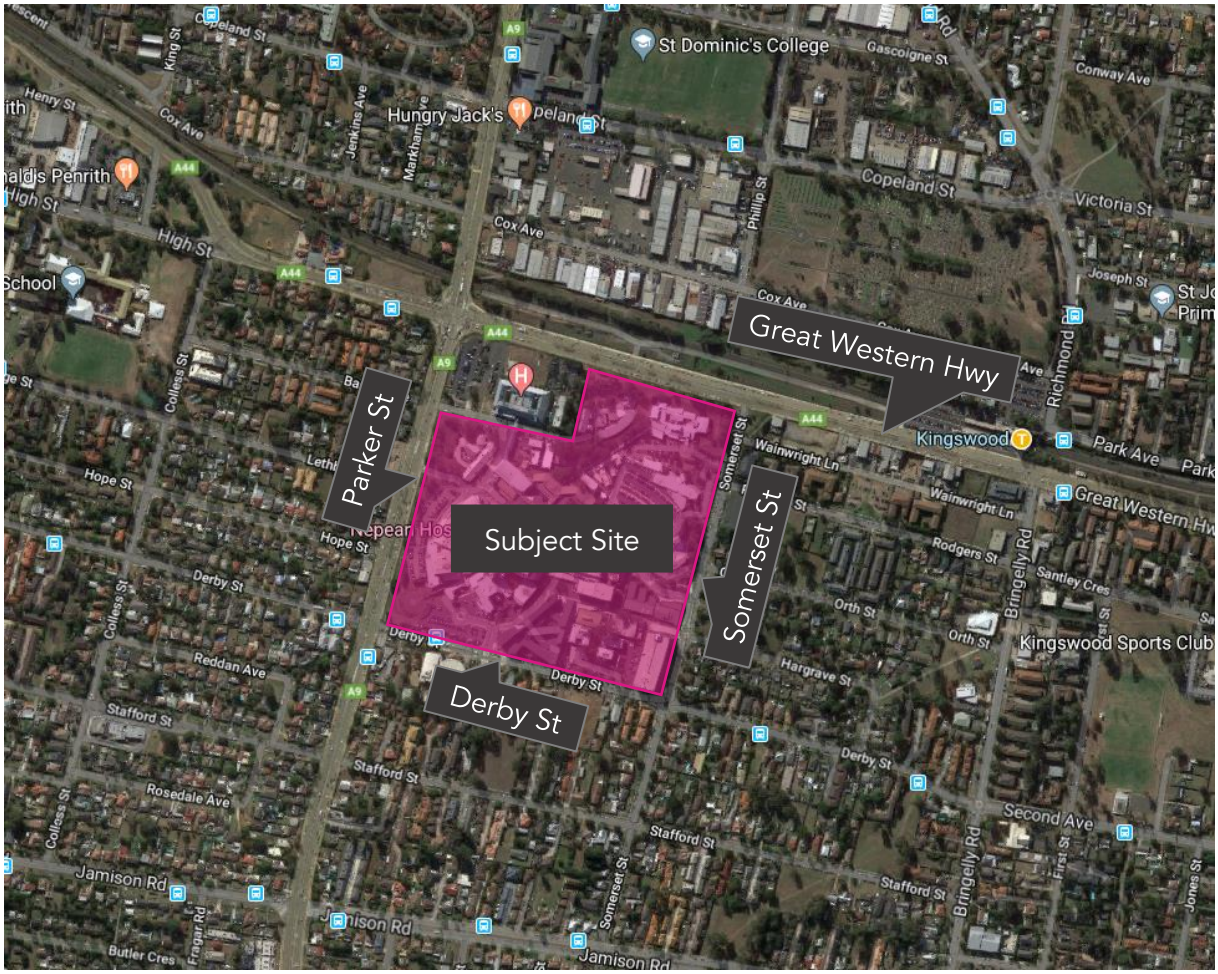

Figure 2 – Aerial View of the Nepean Hospital Campus (Source: Google Maps)

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5.1.1 Existing Surrounding Land Use

In the context of the surrounding land use, the Hospital's area is classified as an Infrastructure Zone (SP2) and is surrounded by a variety of different land uses:

- The west of the hospital is characterised by Medium (R3) and High (R4) Density Residential dwellings;
- Immediately to the east and south of the hospital is a Mixed Use (B4) area, followed by Medium (R3) and High (R4) Density Residential housings and the Chapman Gardens Oval, zoned as Public Recreation (R1);
- To the north-east of the Hospital lies a General Industrial (IN1) area, accommodating railway tracks, the Kingswood Railway station and several automotive outlets along the Great Western Highway. Behind these is the Kingswood Cemetery, zoned as Special Activities (SP1).

Figure 3 shows the surrounding land use.

Figure 3 – Surrounding Land Use (Source: NSW Planning Portal 2017)

5.1.2 Future Surrounding Land Use

In 2007, the NSW Department of Planning and Penrith City Council published the Penrith City Centre Plan, which outlines the foundation to ensure the rapid growth of the Western Sydney hub will be accommodated for within a 25-year period. The City Centre Plan aligns with the key objectives of the Council's vision for Penrith to ensure growth into a "prosperous, vibrant and attractive city".

The City Centre Plan identifies development opportunities in the context of the expected growth in population of 10,000 new residents and 10,000 new jobs within the City Centre.

The key initiatives identified within City Centre Plan include:

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- Promoting office development in the commercial core;
- Promoting Government office accommodation options for the city centre;
- Investigating options for the development of the city park;
- Developing strategies to improve the educational facilities within the city centre; and
- Improving the accessibility within the city centre by investigating new transport options and planning for the necessary infrastructure.

In 2011, the Penrith Business Alliance (PBA) published the Penrith Health and Education Precinct Strategic Vision. The document aims to create local jobs by growing the skills base of the area as well as attract new investment to Penrith through the delivery of projects focused in four key areas:

- World leading health services;
- Education and training related to health and wellbeing;
- Research, in medicine and preventative health; and
- Business opportunities, related to health, medicine and wellbeing.

Consequently, the proposed Nepean Hospital Redevelopment is consistent with the objectives relevant to the Penrith Health and Education Precinct Strategic Vision, which will promote future government and non-government investment and development in the region's health sector.

5.2 Current Site Use

The Nepean Hospital is part of the Nepean Blue Mountains Local Health District, providing public health services to Greater Western Sydney. The area is served by a number of hospitals including Hawkesbury Hospital, Springwood Hospital, Blue Mountains Hospital and Lithgow Hospital.

The Hospital is the principal referral hospital and regional trauma centre for Western Sydney and provides a diverse range of services including emergency, intensive care, cancer care, cardiology, community health, drug & alcohol, medical imaging, mental health, sexual health, rehabilitation, pharma & allied health, and surgical services (including dental, neurosurgery, orthopaedic, plastic& reconstructive, thoracic, breast & endocrine, ENT, urology and vascular).

The Hospital also has an educational alliance with the University of Sydney. Medical, nursing and allied health students are placed at the hospital for practical terms.

The existing Hospital Campus map is presented in Figure 4.

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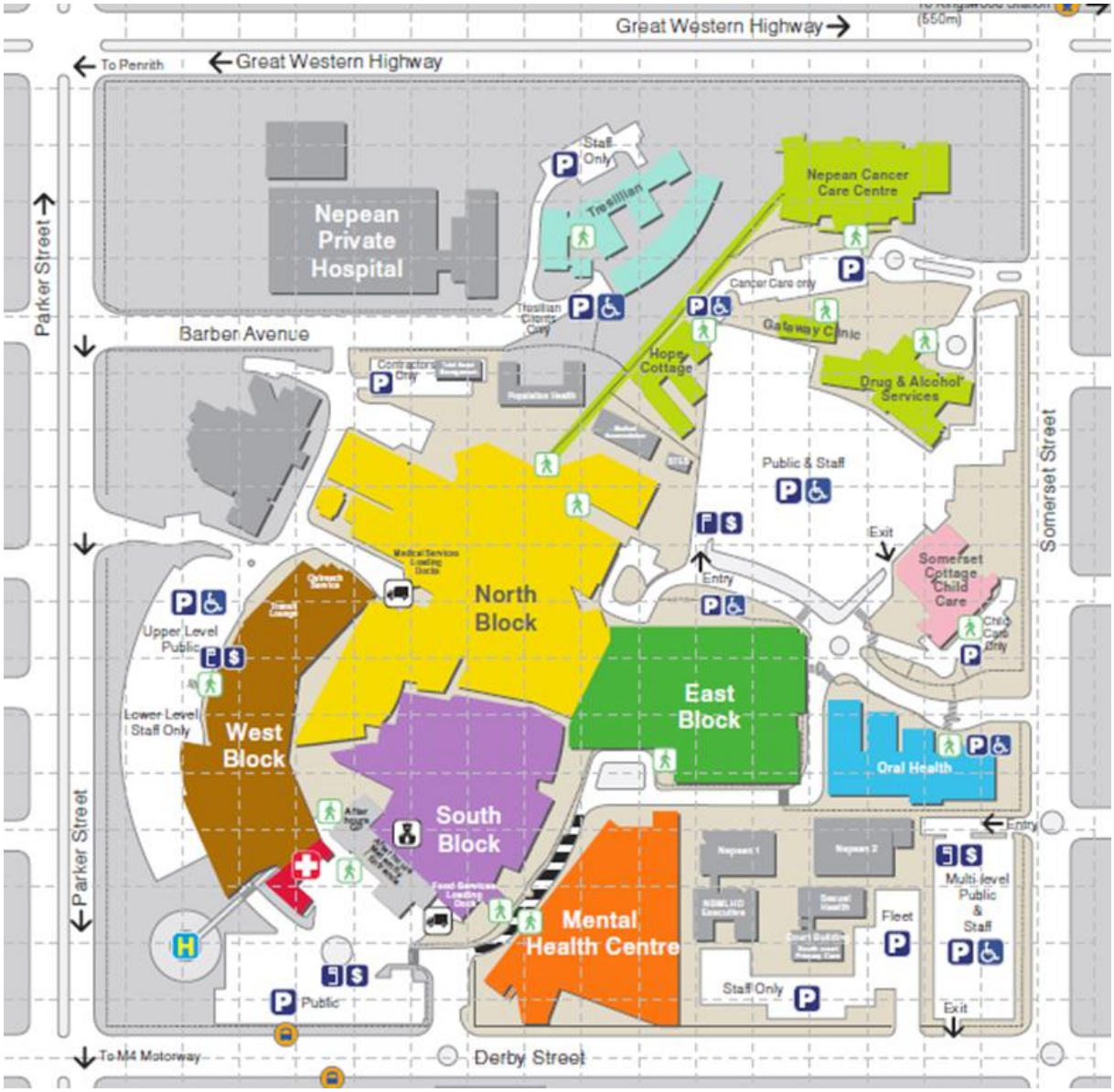

Figure 4 – Existing Nepean Hospital Campus Map (Source: NSW Health)

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Development Proposal

Over the next 10 years, Nepean Hospital will undergo redevelopment to provide additional services to support the local and regional health demand requirements within Greater Western Sydney. The plans include the construction of the approved multi-deck car park (DA17/0665) and redevelopment of the hospital as per
6. the new master plan prepared by BVN Architects for the horizon years 2021/22 & 2026/27.

The hospital redevelopment will enable the hospital to accommodate an additional 161,461 outpatient occasions of service per annum, 30,257 Emergency Department presentations per annum, over 200 inpatient beds and 1,115 students per annum by 2027.

6.1 Construction Staging

The proposed redevelopment involves the construction of an additional hospital building (the Stage 1 Building for the new main hospital tower), and a separate project comprising an approved Multi-Deck Car Park (MDCP currently being constructed) with a capacity of 628 spaces and rooftop helipad (see Figure 5).

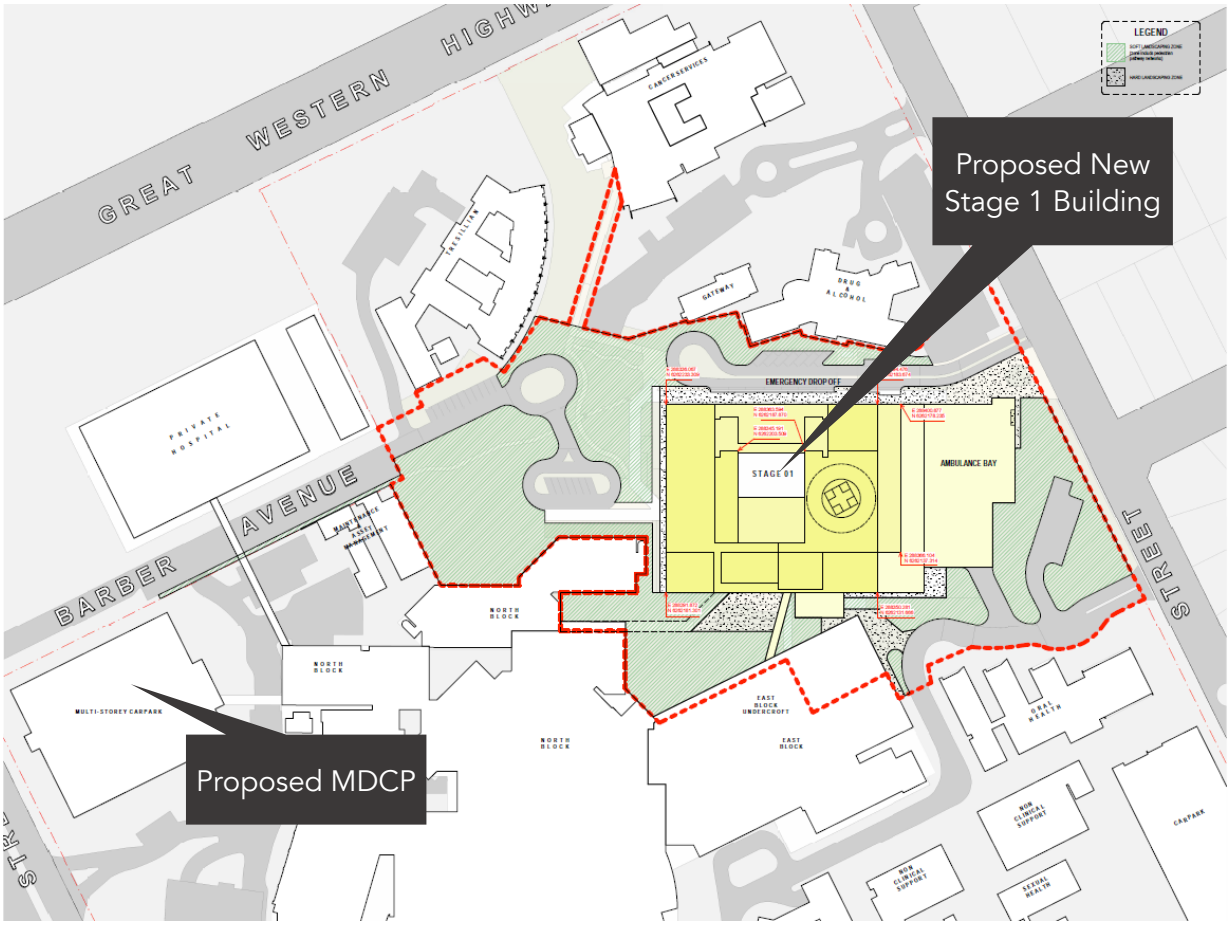

Figure 5 – Nepean Hospital Redevelopment Overview

It is noted that the construction of the MDCP is currently under construction, whilst the construction of the Stage 1 Building is scheduled to be undertaken between early 2019 and late 2021. It is acknowledged that there is an overlap of the two construction activities; however, it is anticipated that the construction of the MDCP will be nearing completion, prior to the commencement of works for the Stage 1 Building. In light of

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this, only minor finishing works will be undertaken when the construction of the Stage 1 Building commences. Hence, a cumulative traffic impact assessment is not required.

The redevelopment works include the construction of 40 additional parking bays within the emergency vehicle areas and parking in the MDCP helipad area (addition of 108 car spaces) as well as an additional 20 spaces adjacent and to the north of new hospital building.

The construction program is divided into two key phases, as outlined below:

Table 4 - Construction Programme

	Time Period	Scope of Works
Phase I	January 2019 – May 2019	Demolition works including the mobilisation and clearing existing site, excavation, piling and in-ground works (construction of new temporary driveway and layback are to be completed under REF (Gate 1)
Phase II	June 2019 – September 2021	Construction of the Stage 1 Building

Figure 6 presents the site establishment plan. A temporary vehicular driveway (Gate 1) will be constructed under a REF to allow construction vehicle access and egress to the site. The location of this driveway has shifted north due to the Childcare Playground remaining until early 2020.

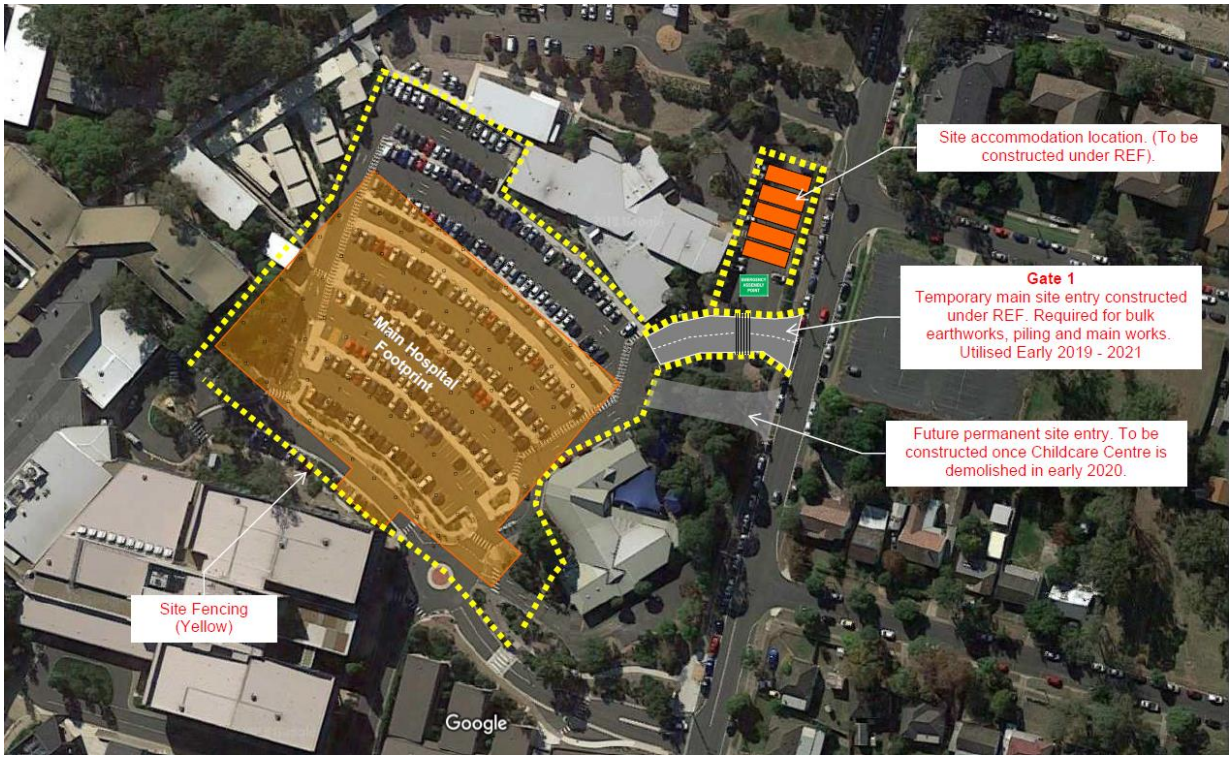

Figure 6 - Site Establishment Plan (Phase I - Site Boundary Zone 1)

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Existing Transportation Facilities

7.1 Road Hierarchy

The Hospital is served by a regional and local road network, which provides ready access to the City Centre and the surrounding region, while the Great Western Highway and Parker Street provide the primary
7. connection to the Sydney CBD. The road network in this area is also comprised of State and Regional roads, as well as local roads providing access to the surrounding land uses.

The surrounding road network is illustrated in Figure 7.

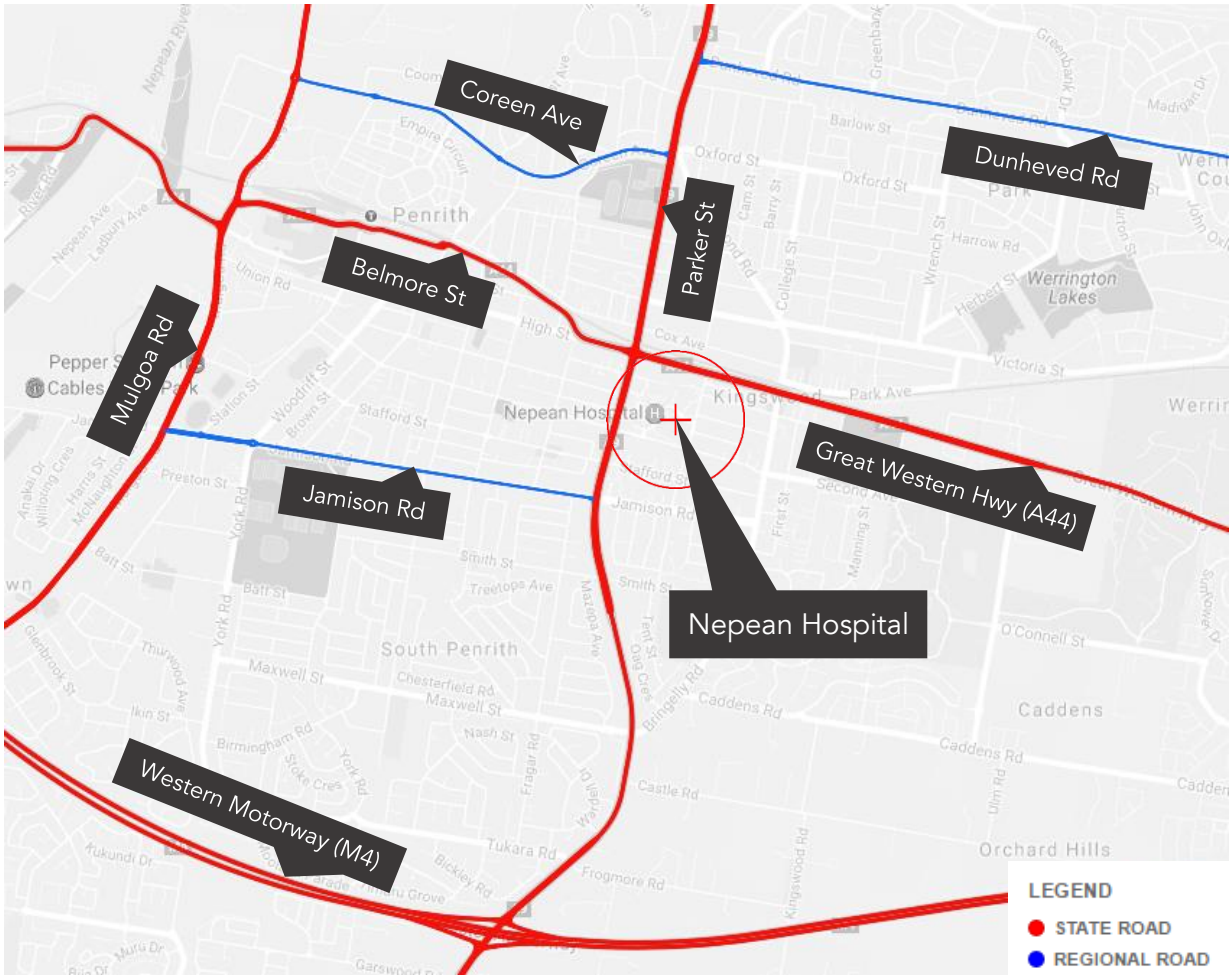

Figure 7 – Road Hierarchy (Source: RMS Road Hierarchy Review)

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

- State Roads: Freeways and Primary Arterials (RMS Managed)
- Regional Roads: Secondary or sub-arterials (Council Managed, Part funded by the State)
- Local Roads: Collector and local access roads (Council Managed)

The road network serving the site includes:

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Great Western Highway	
Road Classification	State Road
Alignment	East – West
Number of Lanes	3 lanes in each direction
Carriageway Type	Divided
Carriageway Width	22.5 metres
Speed Limit	60kph
School Zone	No
Parking Controls	Eastbound: unrestricted parking on the outer most lane; Westbound: partially unrestricted parking on the outer most lane, partially 'No Stopping'
Forms Site Frontage	Yes

Figure 8 – Streetview of Great Western Highway, Eastbound (Source: Google)

Parker Street	
Road Classification	State Road
Alignment	North – South
Number of Lanes	3 lanes in each direction
Carriageway Type	Divided
Carriageway Width	22.5 metres
Speed Limit	70kph
School Zone	No
Parking Controls	Southbound: unrestricted parking on the outer most lane; Northbound: partially unrestricted parking on the outer most lane, partially 'No Stopping'.
Forms Site Frontage	Yes

Figure 9 – Streetview of Parker Street, Northbound (Source: Google)

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Derby Street	
Road Classification	Local Road
Alignment	East – West
Number of Lanes	1 lane in each direction
Carriageway Type	Un-divided
Carriageway Width	12 metres
Speed Limit	50kph
School Zone	No
Parking Controls	Eastbound: partially 'No Stopping' and 'Bus Zone' areas, partially free 2-hour parking; Westbound: partially 'Bus Zone' and free 15 min parking, partially free 4-hour parking.
Forms Site Frontage	Yes

Figure 10 – Streetview of Dorby Street, Eastbound (Source: Google)

Somerset Street	
Road Classification	Local Road
Alignment	North – South
Number of Lanes	1 lane in each direction
Carriageway Type	Un-divided
Carriageway Width	12 metres
Speed Limit	50kph
School Zone	No
Parking Controls	Free 2-hour parking northbound and 4-hour parking southbound
Forms Site Frontage	Yes

Figure 11 – Streetview of Somerset Street, Northbound (Source: Google)

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Barber Avenue	
Road Classification	Local Road
Alignment	East – West
Number of Lanes	1 lane in each direction
Carriageway Type	Un-Divided
Carriageway Width	9 metres
Speed Limit	50kph
School Zone	No
Parking Controls	Free 2-hour parking on the southern road side, 'No Stopping' on the northern road side
Forms Site Frontage	Yes

Figure 12 – Streetview of Barber Avenue, Eastbound (Source: Google)

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7.2 Key Intersections

A number of key intersections have been identified in the vicinity of the development site (see Figure 13). These are listed below, together with their characteristics:

1. Great Western Hwy / Parker St – Four arm signalised intersection;
2. Western Motorway / The Northern Road – Four arm signalised intersection;
3. Great Western Hwy / Somerset St – Non-signalised T-intersection;
4. Jamison Rd / Somerset St - Non-signalised T-intersection;
5. Jamison Rd / Bringelly Rd - Non-signalised T-intersection;
6. Great Western Hwy / Bringelly Rd – Signalised T-intersection;

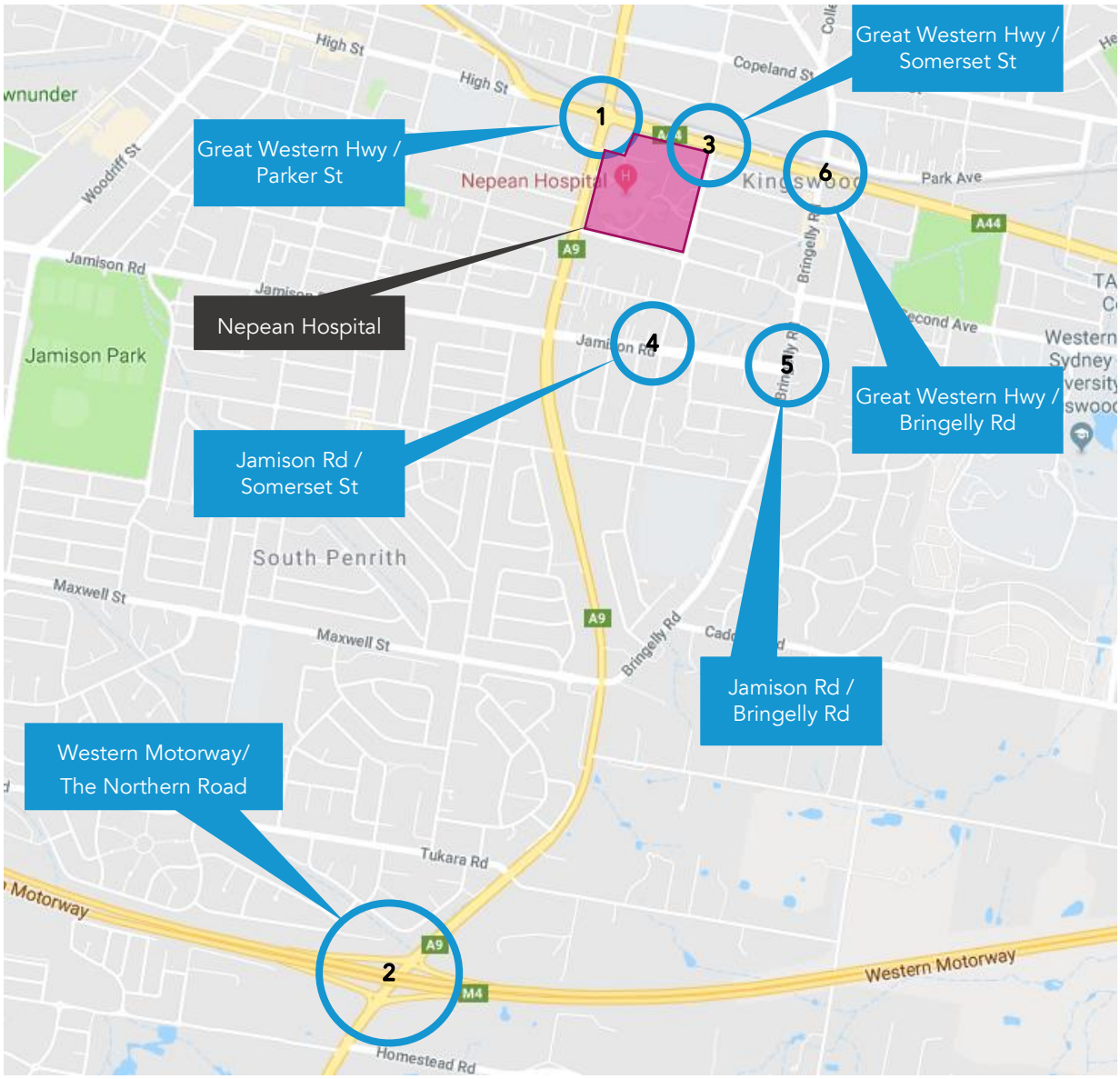

Figure 13 - Key Intersections

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7.3 Traffic Crash Data

The Centre for Road Safety, within Transport for NSW (TfNSW), has provided historical crash data for the five-year period between 2011 and 2015 of crashes within the vicinity of the Hospital, as shown in Figure 14.

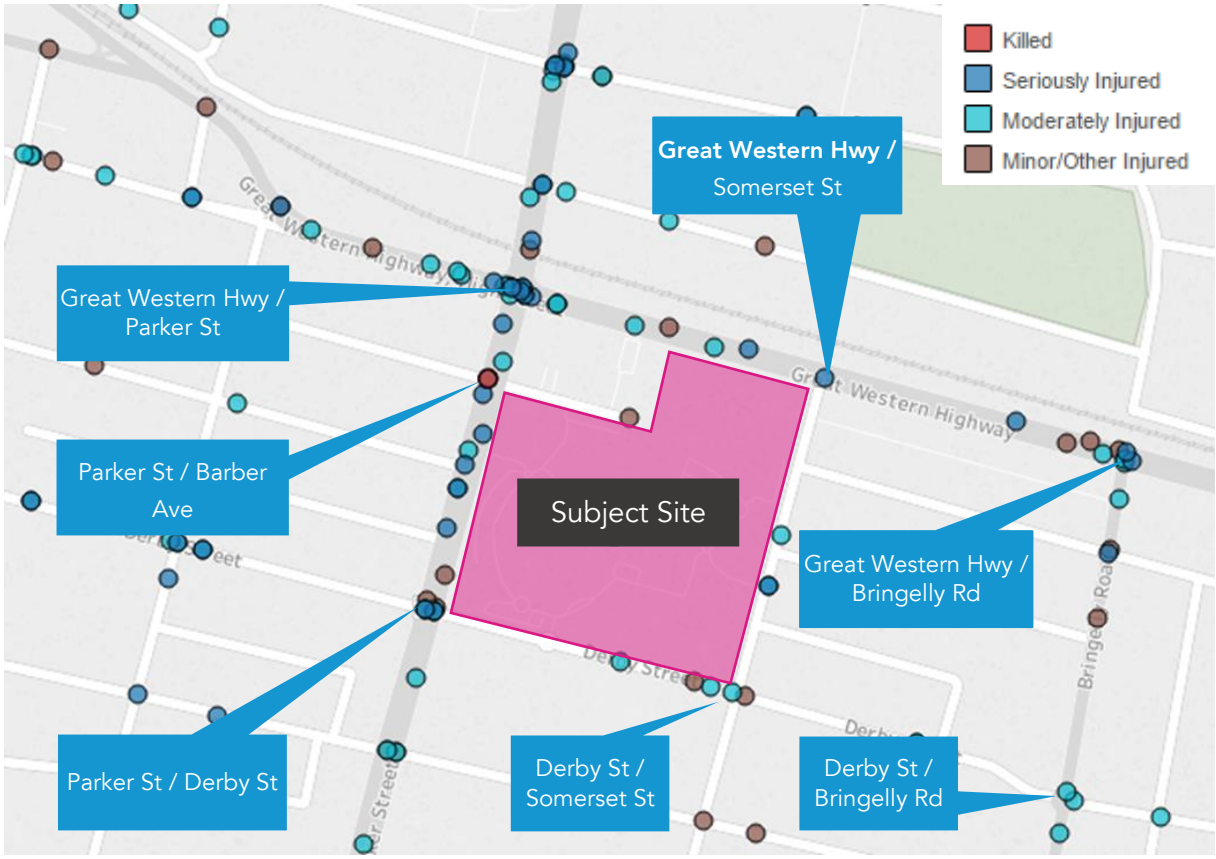

Figure 14 – Crash Data from 2011-2015 (Source: Centre for Road Safety - TfNSW, 2016)

7.4 Public Transport

A number of public transport options are available in the vicinity of the site in the form of buses and rail. The NSW Planning Guidelines for Walking and Cycling 2004 (the Guide) suggests a distance of 400m as a walkable catchment to access local amenities. The Guide also recommends that an 800m catchment is an acceptable, walkable distance if the development is within an area with public transport links. Furthermore, the document also suggests a distance of 1500m is a suitable catchment for cycling for accessibility to public transport facilities and local amenities.

7.4.1 Rail

The closest station, Kingswood Railway Station, is located approximately 600m (walking distance) from the site, which is considered to be within reasonable walking distance.

The station is on the T1 Western Line, from Emu Plains and Richmond to the City. Services operate every 5 – 15 minutes during peak hours, with services operating from 3.16am to 11.36pm.

The distance from the Hospital, the availability of taxi links from the station to the Hospital as well as the relative frequency of services could make heavy rail an attractive mode share option for construction workers.

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7.4.2 Bus Services (Private and Public)

The Hospital Precinct is serviced by the bus routes presented in Table 5. There are two bus stops located on the southern boundary of the Hospital Precinct and two bus stops on Great Western Hwy, as indicated in Figure 15.

Table 5 – Bus Service Summary

Route No.	Coverage	Frequency
677	Richmond to Penrith	Weekdays: Services every 60 minutes in the morning peak and 2 services in the evening peak Weekends: 2 services, at 9:31am and 5:14pm
774	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 6:25am and 11:36pm Weekends: Services every 1 hour, between 7:33am and 10:20pm
775	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 5:21am and 10:56pm Weekends: Services every 1 hour, between 7:33am and 10:20pm
776	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 5:36am and 10:20pm Weekends: Services every 1 hour, between 8:14am and 11:03pm
780	Mount Druitt to Penrith	Weekdays: Services every 15-30 minutes, between 5:18am and 10:10pm Weekends: Services every 30-60 minutes, between 6:31am and 9:31pm
789	Luddenham to Penrith	Weekdays: 2 services every weekday, at 7:54am and 4:30pm Weekends: No services

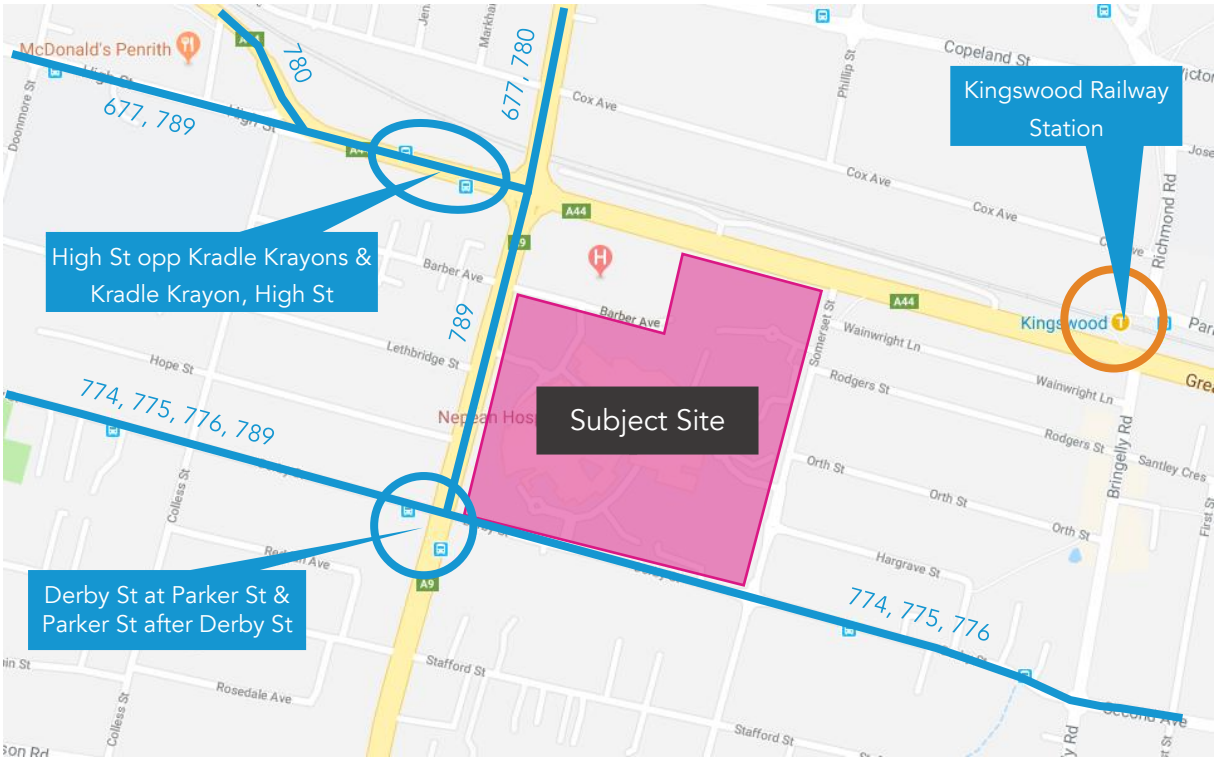

Figure 15 – Local Bus Services Map

The Hospital is relatively well serviced by bus, with a number of routes and regular services (every 30 mins on weekdays), and therefore provides an alternative mode share option for some construction workers, subject to the availability of convenient bus stops close to their home location.

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7.5 Active Transport

In addition to public transport, the locality has also been assessed for its active transport potential.

7.5.1 Bicycle Network

It is noted that the cycling infrastructure in the Penrith region is relatively underdeveloped, with no dedicated bicycle paths in the vicinity of the Hospital. As such, cycling is not expected to be an attractive method of travel for construction staff.

7.5.2 Pedestrian Facilities

The pedestrian infrastructure is well developed in the vicinity of the hospital, with footpaths on both sides of the surrounding roads, signalised pedestrian crossings, zebra crossings, appropriate signage and markings. In addition to this, the topography of the area is relatively flat. However, as with cycling, walking is only likely to be an attractive option for workers who live relatively close to the Hospital.

The campus is surrounded by a reasonable volume of low-density residential developments, apart from the area to the north of the Great Western Highway, which are predominantly light industrial and bulky goods.

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8. Traffic Management Plan

8.1 Objective

The traffic management plan associated with the construction activity aims to ensure the safety of all workers and road users within the vicinity of the construction site and the following are the primary objectives:

- To minimise the impact of the construction vehicle traffic on the overall operation of the road network;
- To ensure continuous, safe and efficient movement of traffic for both the general public and construction workers;
- Installation of appropriate advance warning signs to inform users of the changed traffic conditions;
- To provide a description of the construction vehicles and the volume of these construction vehicles accessing the construction site;
- To provide information regarding the changed access arrangement and also a description of the proposed external routes for vehicles including the construction vehicles accessing the site; and
- Establishment of a safe pedestrian environment in the vicinity of the site.

8.2 Hours of Work

All works, associated with the project will be restricted to the following proposed working hours associated with the construction activity as per *SSDA Conditions C5* and *C8*:

C5. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

- Mondays to Fridays inclusive — 07:00am to 06:00pm;
- Saturdays — 07:00am to 05:00pm[3]; and
- Sunday or public holidays — No works may be carried out.

C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

- Monday to Friday — 09:00am to 12:00pm & 02:00pm to 05:00pm;
- Saturday — 09:00am to 12:00pm; and
- Sunday or public holidays — No works to be undertaken.

8.2.1 Exceptions

It is noted however, that the following *SSDA Condition C6* states that activities may be undertaken outside the construction hours of work outlined in *Condition C5*, if required:

- by the Police or a public authority for the delivery of vehicles, plants or materials; or
- in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or

[3] Justification of the hours for Saturday is provided within the Construction Management Plan

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- where the works are inaudible at the nearest sensitive receivers; or
- where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works.

8.3 General Requirements

All construction activities shall be wholly contained within the approved construction compounds, including, but not limited to plant, vehicles, materials, waste, site offices and amenities.

Any hoardings and barriers shall not impact pedestrians, maintaining worksite security, whilst providing appropriate pedestrian thoroughfare. Providing safe pedestrian visibility near any crossing points will be key criteria in the hoarding arrangements. Prior to any site establishment works, the hoarding arrangement will obtain approval from the relevant Certifying Authority. Upon completion of any stage, the dismantling of any hoardings or road-signage shall be done in accordance with RMS Traffic Control at Works Sites Manual.

In accordance with Road and Maritime Services (RMS) requirements, all vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during travel to and from the site. All subcontractors must be inducted by the lead contractor to ensure that the procedures are met for all vehicles entering and exiting the construction site. The lead contractors will monitor the roads leading to and from the site and take all necessary steps to rectify any road deposits caused by site vehicles.

Vehicles operating to, from and within the site shall do so in a manner, which does not create unreasonable or unnecessary noise or vibration. No tracked vehicles will be permitted or required on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances.

8.4 Construction Vehicle Types

As stated previously, the development involves the demolition of the existing public and staff car park, the excavation of the site and the construction of the Stage 1 Building, which will require removal and delivery of mixed materials. This will involve the use of commercial trucks up to 19m 'truck and dogs' and 19m articulated vehicles (AVs).

Any oversized vehicle that is required to travel to the site will be dealt with separately, with the submission of required permits to, and subsequent approval by the relevant authority prior to any delivery. It is also anticipated that some special oversize vehicles will be required, such as a crane. These vehicles will be subject to an access permit application to the National Heavy Vehicle Regulator (NHVR).

All construction vehicles are to enter and exit the site in a forward movement. In the event of an emergency or where a large vehicle cannot turn around within the confines of the site, a reverse manoeuvre to enter and exit the site can be performed at the direction of RMS accredited traffic controllers. The swept path analysis for a 19-meter articulated vehicle (AV) reversing manoeuvre entering and exiting the construction site is shown in Attachment 6.

> Note: Any adjustment to the CTMP should be developed in consultation with council and the contractor prior to being implemented onsite. A suitable Traffic Control Plan (TCP) will be required to be prepared by the appointed traffic management contractor.

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8.4.1 Ambulance Car Park Works

The demolition, civil and structural works associated with the construction of the ambulance car park to the east of the new Tower Building will involve the following vehicle types during each phase[4]:

Table 6 - Largest Anticipated Vehicle for Ambulance Car Park Works

Phase	Largest Anticipated Vehicle
Demolition	8.9m Bogie
Civil Works	19m Truck & Dog
Structural Works	8.8m MRV

A swept path assessment has been conducted to demonstrate that access and egress to the construction site for the above vehicles during each phase is feasible. For details of the swept path assessment, please refer to Attachment 7.

Where vehicles are required to utilise the opposing traffic lane for manoeuvring, suitably qualified traffic controllers are required to coordinate traffic movements to allow access and egress for construction vehicles.

The following access arrangements that requires traffic controllers are:

Table 7 – Associated vehicle routes that require traffic controllers

Vehicle Size	Phase	Route Description
8.9m Bogie	Demolition	• Right turn reverse-in only access to subject site will require traffic controllers as vehicles encroach onto opposing traffic lanes • Left turn egress from site onto Somerset Street will require a traffic controller as vehicles encroach onto opposing traffic lane
19m Truck & Dog	Stage 1 Civil	• Left turn egress from the southern driveway from site onto Somerset Street will require traffic controllers as vehicles encroach onto opposing traffic lane • Left turn egress from the layback access drive will require a traffic controller as vehicles encroach onto opposing traffic lane

[4] Construction phases outlined here refer specifically to the demolition, civil and structural works for the ambulance parking area only and not the overall Stage 1 redevelopment.

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	Stage 2 Civil	• Left turn egress from the layback access drive will require a traffic controller as vehicles encroach onto opposing traffic lane

The approximate locations of traffic controllers required for the ambulance car park works are also illustrated in Attachment 7.

It is highlighted that the swept path drawings do not constitute a detailed TCP and this will need to be prepared and submitted separately by the appointed traffic management contractor for approval by Council.

8.5 Construction Vehicle Routes

A consistent approach to traffic management is to be adopted throughout all phases of the proposed works. To ensure the minimisation of impacts to the local and regional road network from truck movements, trucks will adopt a 'forward in, forward out' principle for site access and egress, as well as to the proposed Works Zone, to ensure safety of pedestrians, cyclists and other motorists. The 'forward in' movement allows a safer environment for other road users and pedestrians. If required, RMS accredited traffic controllers will be engaged to regulate safe construction vehicle activity within the construction site vicinity.

In the event of an emergency or where a large vehicle cannot turn around within the confines of the site, a reverse manoeuvre to enter and exit the site can be performed at the direction of RMS accredited traffic controllers. The swept path analysis for a 19-meter articulated vehicle (AV) reversing manoeuvre entering and exiting the construction site is shown in Attachment 6.

> Note: Any adjustment to the CTMP should be developed in consultation with council and the contractor prior to being implemented onsite. A suitable Traffic Control Plan (TCP) will be required to be prepared by the appointed traffic management contractor.

The site is located in Kingswood and the proposed construction vehicle routes have regard for the surrounding traffic arrangements within the vicinity of the site.

The proposed construction vehicle routes are outlined in Figure 16. These routes shall be communicated to construction staff during the induction process. As a general requirement however, all drivers and associated companies are responsible for adhering to the road rules and regulations.

As stated previously, a temporary layback is proposed within the Somerset Street frontage to allow construction vehicular access into the site. This work will be completed under a REF.

Construction vehicle access will be limited to the State and Regional road network wherever practicable to minimise the impact on the surrounding road network.

Construction vehicles travelling to the site from the north are able to travel southbound along Parker Street, turn east onto the Great Western Highway then proceed south along Somerset Street towards the site. Vehicles travelling from the east and west are able to utilise the Western Motorway, turn north onto The Northern Road, turn east onto the Great Western Highway and proceed south onto Somerset Street to Gate 1. Similarly, vehicles from the south are able to follow the route outlined previously to access the site.

For egress routes, vehicles travelling towards the east will be required to travel south along Somerset Street, turn east onto Jamison Road, north along Bringelly Road towards the signalised intersection and east onto

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the Great Western Highway. Construction vehicles travelling towards the north, south or west will need to travel north along Somerset Street, east along the Great Western Highway towards the destination.

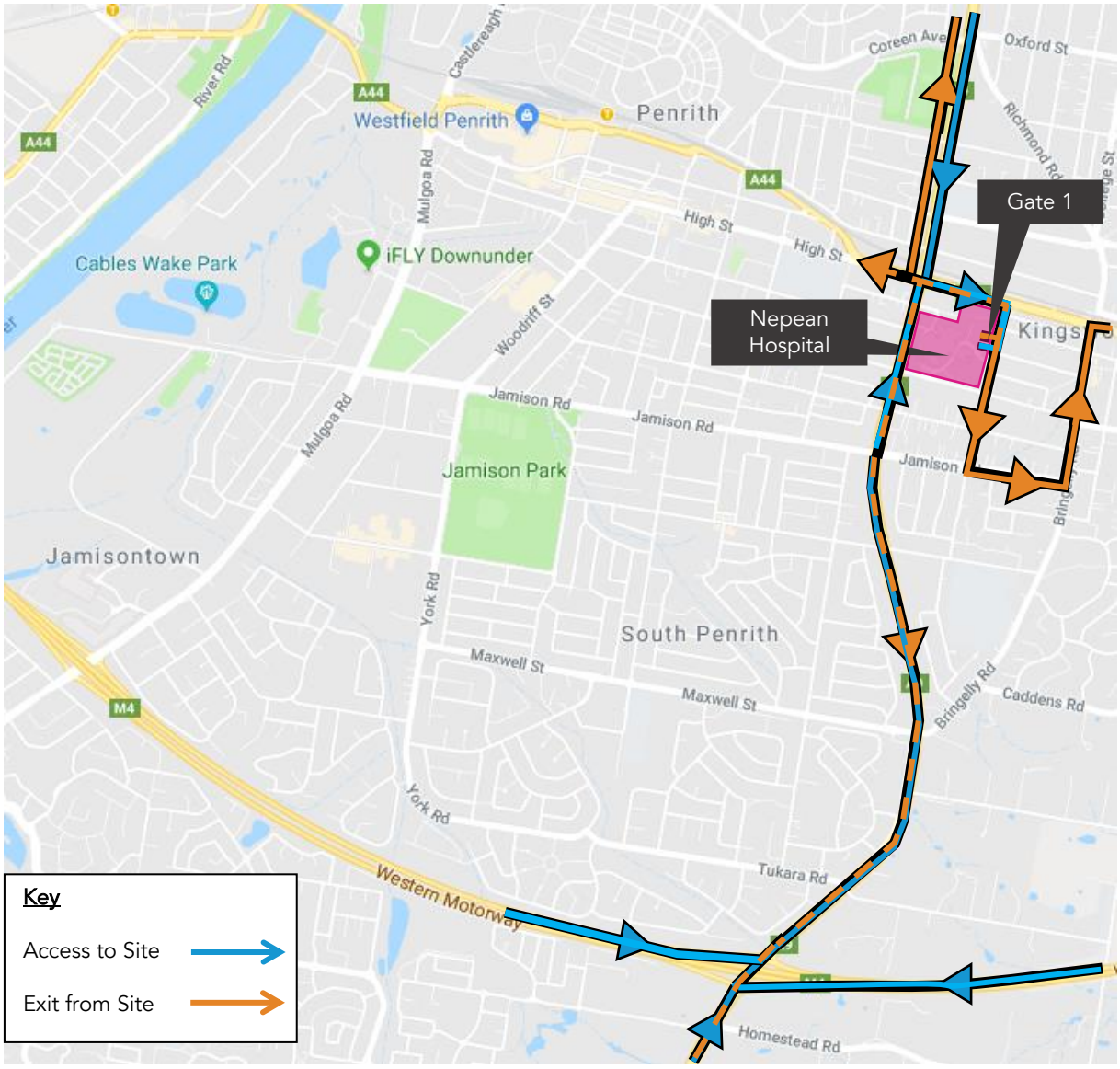

Figure 16 – Proposed Construction Vehicle Routes during Stage 1 Early Works

8.5.1 Construction & Demolition Waste Management

It is understood that **ptc.** is acting on behalf of the applicant (CPB Contractors) to notify the Traffic Management Centre (TMC) of the truck route(s) to be followed by trucks transporting waste material from the site. This shall be communicated prior to the commencement of the removal of any waste material from the site, which will satisfy *SSDA Condition B32*. Details of the notification of the truck routes to the TMC are included in Section 3.

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8.6 Construction Impacts & Stakeholders

8.6.1 Construction Activity

ptc. has been advised by CPB that on average, it is estimated that there will be approximately 350 construction workers on site with up to 500 workers during the peak construction phases.

Based upon calculations prepared by CPB, it is estimated that the truck movements associated with bulk excavation deliveries will involve up to 75 trucks per day. It is noted that bulk excavation is scheduled to occur for a duration of 16 weeks in total. In light of this information, it is estimated that there will be approximately eight heavy vehicle movements during the peak hour, assuming 10% of truck movements occurring during the peak.

As there is limited parking available within the vicinity of the site and due to the lack of parking for construction staff, driving to the site is not considered an attractive mode of travel for workers. As such, it is not anticipated that there will be a significant traffic impact in regard to light vehicles.

Given the close proximity of the State and Regional road network to the hospital, it is anticipated that the increase in traffic volumes will be within tolerance of the local road network.

8.6.2 Impacts on Road Network

It is considered that in general, construction impacts will be limited as all selected routes aims to minimise use of local roads as far as is practicable.

In light of the above, although the volume of light and heavy vehicles will increase within the immediate road network, these increases are not expected to create any major traffic-related impacts to the road users and local population around the site.

8.6.3 Impacts on Pedestrians and Cyclists

Site fencing will be established to prohibit any pedestrian accessing into the site. A Traffic Control Plan (TCP) will be prepared by the proponent outlining the vehicular access points and traffic controller locations to minimise any risk to the pedestrians on the footpath. The TCP will be submitted by the proponent to Council in due course.

A stated in Section 7.5.1, there are no dedicated bicycle paths at the vicinity of the site, hence no impact on the cyclists is expected.

8.6.4 Impact on the Bus Network

As shown in Figure 15, the existing bus stops are located away from the construction site access. Therefore, no impact on the bus network is expected.

8.6.5 Stakeholders

Stakeholders should be identified, and informed of the proposed works, potential timing, and possible impacts. These details will be better understood upon further development progression. Some of the initial stakeholders are listed in the following section.

- Health Infrastructure (Proponent);
- Department of Planning & Environment (Approval Authority);

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- Penrith City Council;
- Roads & Maritime Services (RMS);
- State Transit Authority (STA); and
- Local Employees and Residents.

8.7 Traffic Control Measures

Traffic Control Plans (TCP) will be developed by the proponent in due course; TCPs shall be developed in accordance with the Australian Standards and the RMS Traffic Control at Works Sites Guidelines.

Traffic controllers may be required to assist in coordinating traffic to allow construction vehicle access and egress movements. Any traffic controllers engaged on-site shall be accredited by RMS, and act in accordance with RMS Standard Conditions, including:

- No stopping of traffic on public streets; and
- No stopping of pedestrians in anticipation of truck movements. Pedestrians may only be held for short periods, for their safety, whilst a truck is entering or leaving the site.

No marshalling or queuing of trucks shall be permitted on the public road.

8.8 Method of Communication Traffic Changes

Traffic control plans in accordance with Australian Standards (AS 1742.3 – Traffic Control Devices for Works on Roads) and RMS Traffic Control at Worksites manual will advise motorist of upcoming changes in the road network.

During construction the contractor shall each morning, prior to work commencing, ensure all signage is erected in accordance with the TCP and clearly visible. Each evening, upon completion of work, the contractor is to ensure signage is either covered or removed as required. Sign size is to be size "A".

Any variation to the layout of the TCP on site is to be recorded and certified by authorised RMS accredited personnel. The associated TCP road signage will inform drivers of works activities in the area including truck movements in operation.

Prior to commencement of works on site, the contractor is to inform neighbouring properties of proposed works and provide site contact information by means of a letter box distribution.

8.9 Pedestrian Access

To provide segregation and protection for pedestrians, temporary fencing is to be established to define the extents of the works site.

All access points are to be securely locked when construction activities are not in progress.

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8.10 Works Zone

An existing Works Zone is located within the Somerset Street frontage of the construction site as illustrated in Figure 17. The ambulance car park works requires the extension of the existing Works Zone by 74m in length during the demolition stage. The proposed work zone must stay clear by 10m from the kerbline as shown in Figure 17 below.

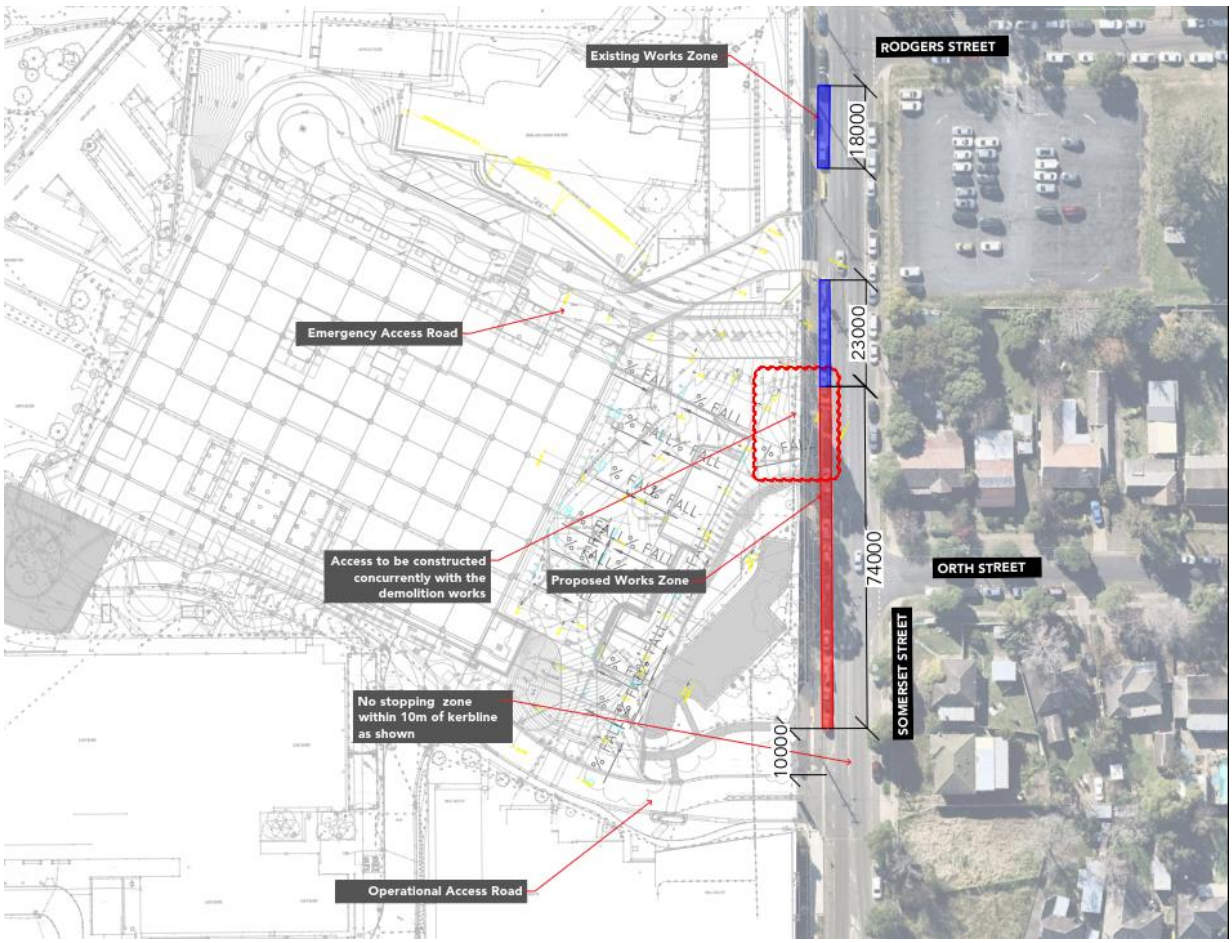

Figure 17 – Existing and Proposed Works Zone on Somerset Street during the Demolition Stage

The proposed works zone during the demolition stage needs to be adjusted during the civil and structural works phase as illustrated in Figure 18. The proposed works zone need to be reduced by 20m as illustrated in Figure 18.

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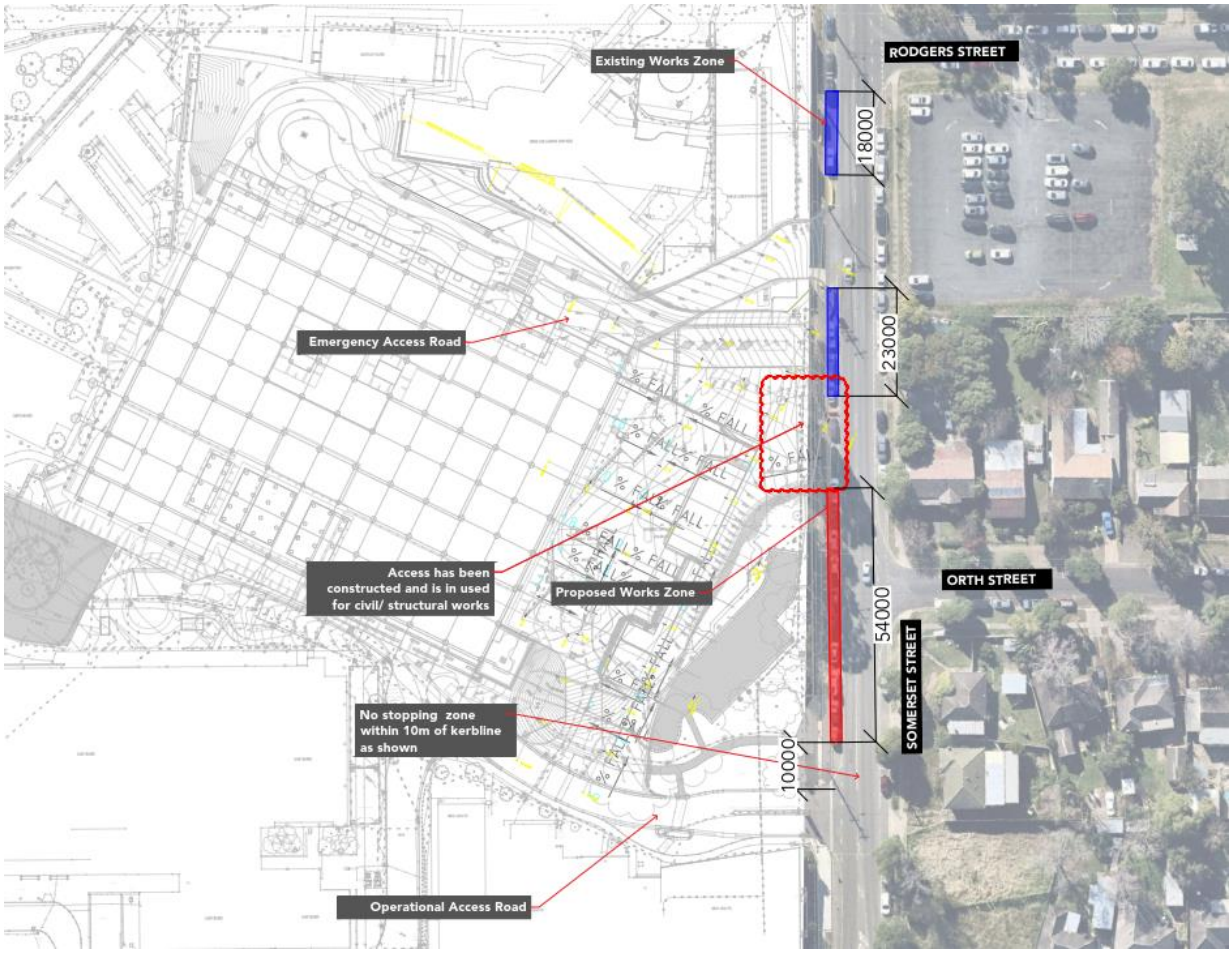

Figure 18 – Existing and Proposed Works Zone on Somerset Street during the Civil/ Structural Works Stage

Neither Great Western Highway nor Parker Street will be affected by the Works Zone.

A separate application will be submitted by the proponent to the relevant consent authority in due course. The application shall include a Dilapidation Report and a Traffic Control Plan (TCP), in accordance with application requirements.

8.11 Road Occupancies

There is no requirement for any demolition and construction vehicles to stop before entering the site. The vehicles will be contained wholly within the construction site or the Works Zone.

No lane or road closures are proposed at this stage, as well as no impact on either Great Western Highway or Parker Street from the development is expected. In the event that works do require a lane or road closure or the works will impact on either Great Western Highway or Parker Street, the proponent shall submit a Road Occupancy Licence (ROL) application to the Transport Management Centre (TMC) for approval, prior to carrying out the associated works. The proponent recognises that a minimum of 10 days is required for the assessment of an ROL and will manage this accordingly.

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8.12 Special Deliveries

Whilst not anticipated, any oversized vehicle that is required to travel to the site will be dealt with separately, with the submission of required permits to and subsequent approval by the relevant consent authority prior to any delivery.

8.13 Driver Code of Conduct

All heavy vehicle drivers are required to follow the ingress and egress routes in a "forward in, forward out" manner as specified in Section 8.5, whilst adhering to all road rules and regulations. This is essential to minimise the impacts of earthworks and construction on the local and regional road network. In the event of an emergency or where a large vehicle cannot turn around within the confines of the site, a reverse manoeuvre to enter and exit the site can be performed at the direction of RMS accredited traffic controllers. The swept path analysis for a 19-meter articulated vehicle (AV) reversing manoeuvre entering and exiting the construction site is shown in Attachment 6.

> Note: Any adjustment to the CTMP should be developed in consultation with council and the contractor prior to being implemented onsite. A suitable Traffic Control Plan (TCP) will be required to be prepared by the appointed traffic management contractor.

Furthermore, construction traffic activity shall only occur within the permitted hours of work (see Section 8.2) to minimise road traffic noise.

This code of conduct will be advised to all drivers engaged on site at the staff induction, where all demolition and construction vehicles (excluding worker vehicles) are to be contained wholly within the Site and must enter the Site completely before stopping.

8.14 Construction Staff Parking

Due to site constraints and the very close proximity of a number of regular bus services, parking will not be provided on-site. To minimise car usage, the contractor will be encouraged to assist in the transportation of workers to the site and all site personnel will be made aware of the public transport options available in the vicinity of the site (refer to Section 7.4) and encouraged to utilise these facilities. Site personnel will also be encouraged to consider car-pooling wherever practicable. Staff related with the construction works should not park on the public road.

8.15 Construction Staff Induction

All construction staff and subcontractors engaged on site will be required to undergo a site induction. The induction will include the Driver Code of Conduct, permitted ingress/egress routes to and from the construction site for all vehicles, as well as standard environmental, WH&S, driver protocols and emergency procedures. Additionally, the lead contractor will discuss CTPMSP requirements regularly as part of a toolbox talks and advise workers of public transport and car-pooling opportunities.

8.16 Work Site Security

To provide security to the works site and protection to the general public, the construction site is to be secured via the use of temporary fencing (e.g. construction site fencing with shade cloth), which will define the extent of the works site. All access points are to be securely locked when construction activities are not in progress.

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8.17 Emergency Vehicle Access

The initial entry into the project site will be provided via the Hospital Road which is located south of the childcare centre (see Gate 2 in Figure 19), until the permanent road is constructed (Gate 1). Once Gate 1 is constructed, all constructed related and emergency vehicular access to the site will occur via Gate 1. Gate 2 will then serve the non-construction related vehicles. Therefore, no traffic controller will be required at Gate 2 once Gate 1 is operational.

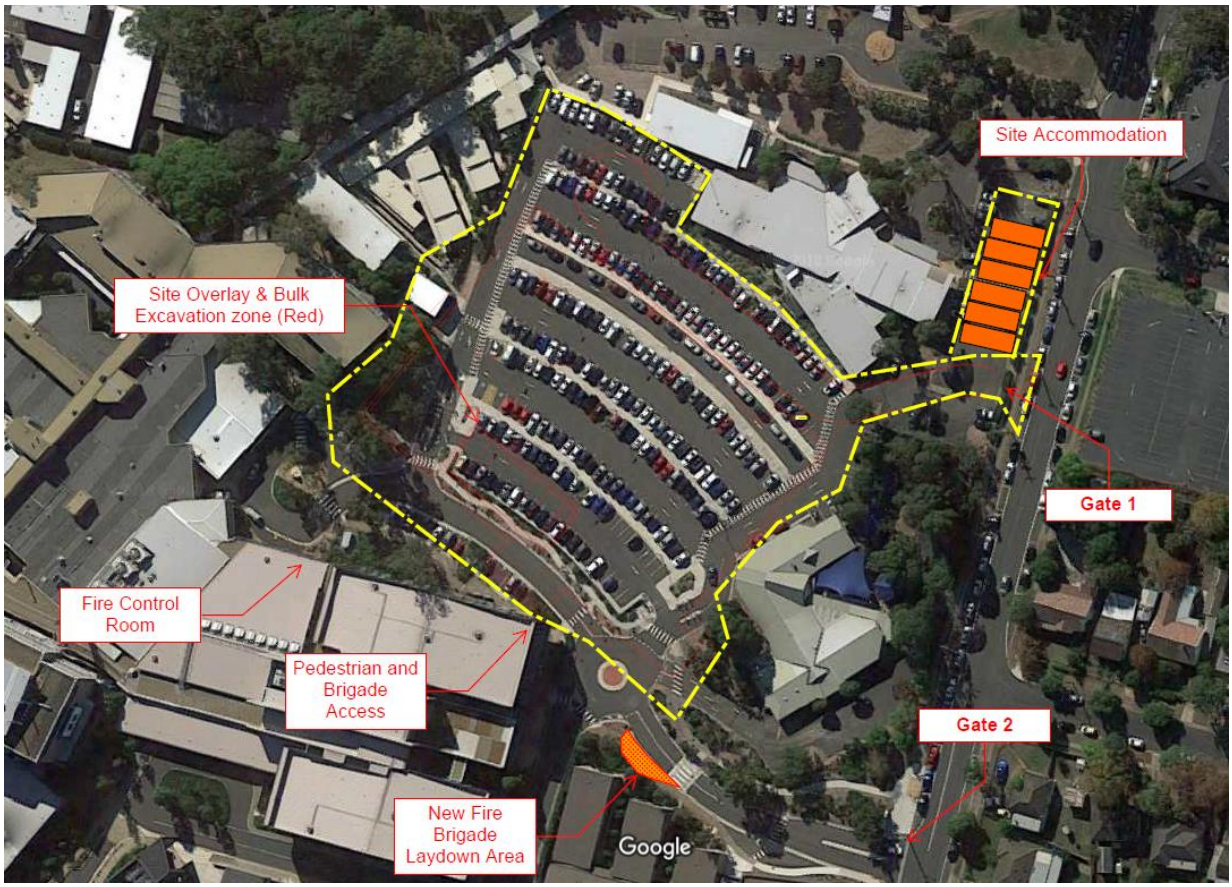

Figure 19 – Proposed Site Establishment Plan

Emergency vehicles will always be given priority during operation hours. Outside of operation hours, on-site staff will be present and will be able to provide access to emergency vehicles, if required.

8.18 Access to adjoining properties

Access to all adjoining properties is to be maintained throughout the works. Access to all adjoining properties will be maintained throughout the works. The adjacent land owners will be notified of works via letter box distribution and road signage to advised of anticipated truck movements in operation with access to adjoining properties being maintained at all times.

8.19 Work Health and Safety

Any workers required to undertake works or traffic control within the public domain shall be suitably trained and will be covered by adequate and appropriate insurances. All traffic control personnel will be required to hold RMS accreditation in accordance with Section 8 of Traffic Control at Worksites.

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8.20 Monitoring Program

The effectiveness of this management plan should be monitored regularly, should an update of this document be required due to any changes to design, surrounding road network, Council, Roads and Maritimes Services (RMS), Transport for New South Wales (TfNSW) or other authority requirements.

8.21 Contact Details for On-Site Enquiries and Site Access

Project Engineer: Max Elmes (0427 123 864)

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Summary

This CTPMSP has been prepared to outline the construction traffic measures to improve site safety to the public and workers and the construction process. In light of our assessment, it is not anticipated that the construction activity will have a significant impact on the local road network.

9. It is envisaged that this document will be continually reviewed and amended if required, due to changes in design, or additional requirements of DPE, Penrith City Council, RMS or any other authority requirements.

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Attachment 1 Construction Vehicle Route Swept Paths

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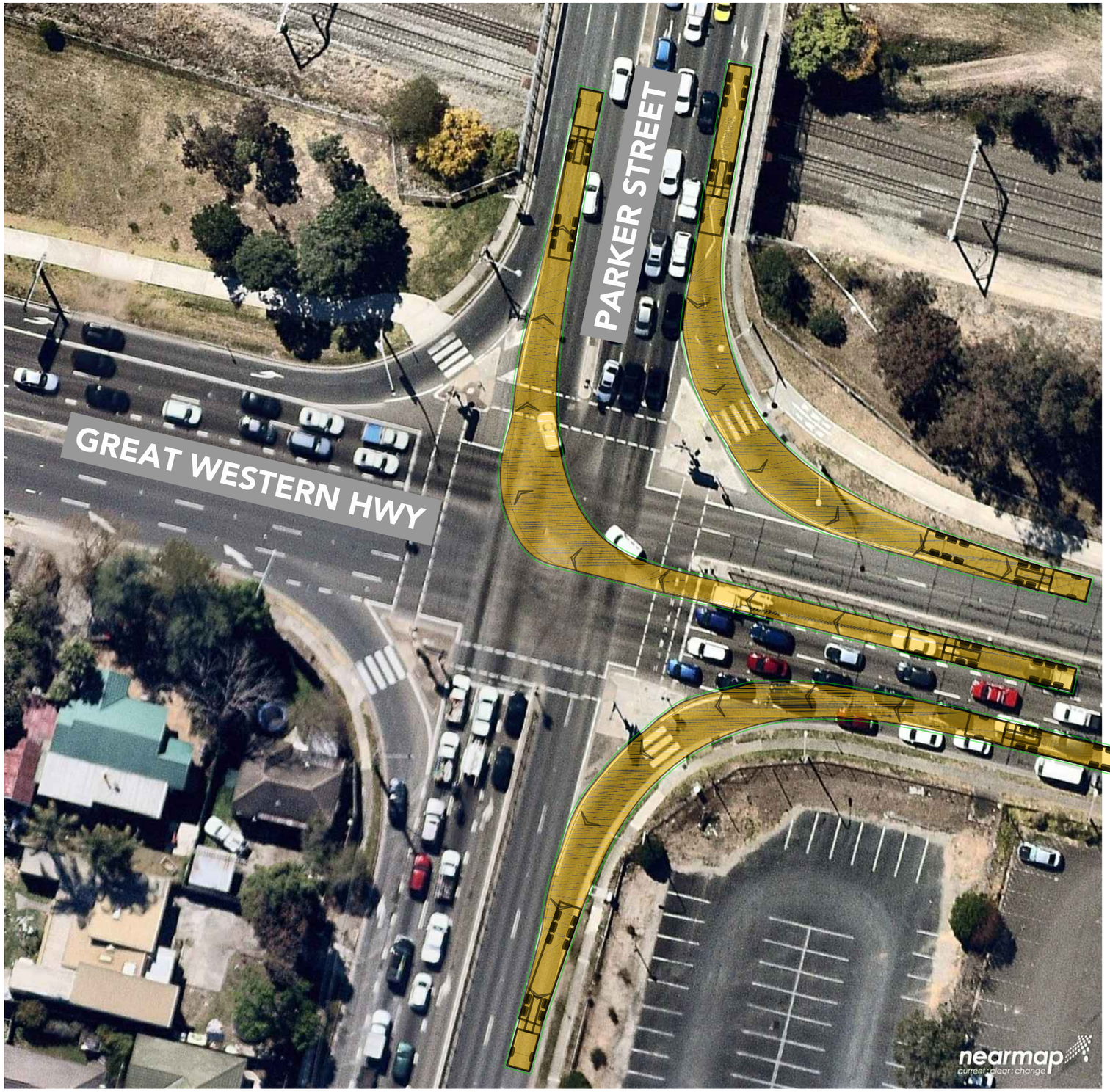
1/1218 - PTC - Nepean Hospital - Truck Routes (Early Works).dwg



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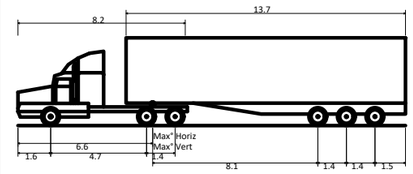

AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

ptc.

Suite 102, 506 Miller Street,
Cammeray NSW 2062

t +61 2 8920 0800

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1	14/12/17	FOR INFORMATION	HL	AU					

PROJECT:

NEPEAN HOSPITAL & INTEGRATED AMBULATORY SERVICES REDEVELOPMENT - CONCEPT & STAGE 1 SSDA

DRAWING TITLE:

SWEPT PATH ANALYSIS
19M ARTICULATED VEHICLE

GREAT WESTERN HWY/PARKER ST

CLIENT: **CBRE PTY LTD**

DRG. #: **PTC-001**

PROJECT #: **T2-2271**

SCALE: **1:500**

REV: **1**

1/1218 - PTC - Nepean Hospital - Truck Routes (Early Works).dwg

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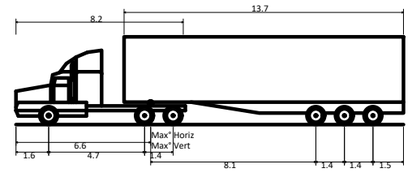

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Cammeray NSW 2062
t +61 2 8920 0800
ptcconsultants.co

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1	14/12/17	FOR INFORMATION	HL	AU					

PROJECT:
NEPEAN HOSPITAL & INTEGRATED AMBULATORY SERVICES REDEVELOPMENT - CONCEPT & STAGE 1 SSDA

DRAWING TITLE:
SWEPT PATH ANALYSIS 19M ARTICULATED VEHICLE

GREAT WESTERN HWY/SOMERSET ST

CLIENT: **CBRE PTY LTD**

DRG. #: **PTC-002**

PROJECT #: **T2-2271**

SCALE: **1:500**

REV: **1**

1/1218 - PTC - Nepean Hospital - Truck Routes (Early Works).dwg

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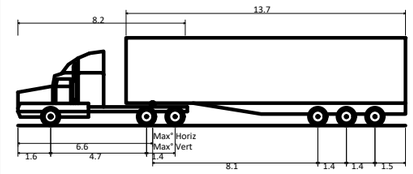

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t +61 2 8920 0800
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1	14/12/17	FOR INFORMATION	HL	AU					

PROJECT:
NEPEAN HOSPITAL & INTEGRATED AMBULATORY SERVICES REDEVELOPMENT - CONCEPT & STAGE 1 SSDA

DRAWING TITLE:
SWEPT PATH ANALYSIS 19M ARTICULATED VEHICLE

JAMISON RD / SOMERSET ST

CLIENT: **CBRE PTY LTD**

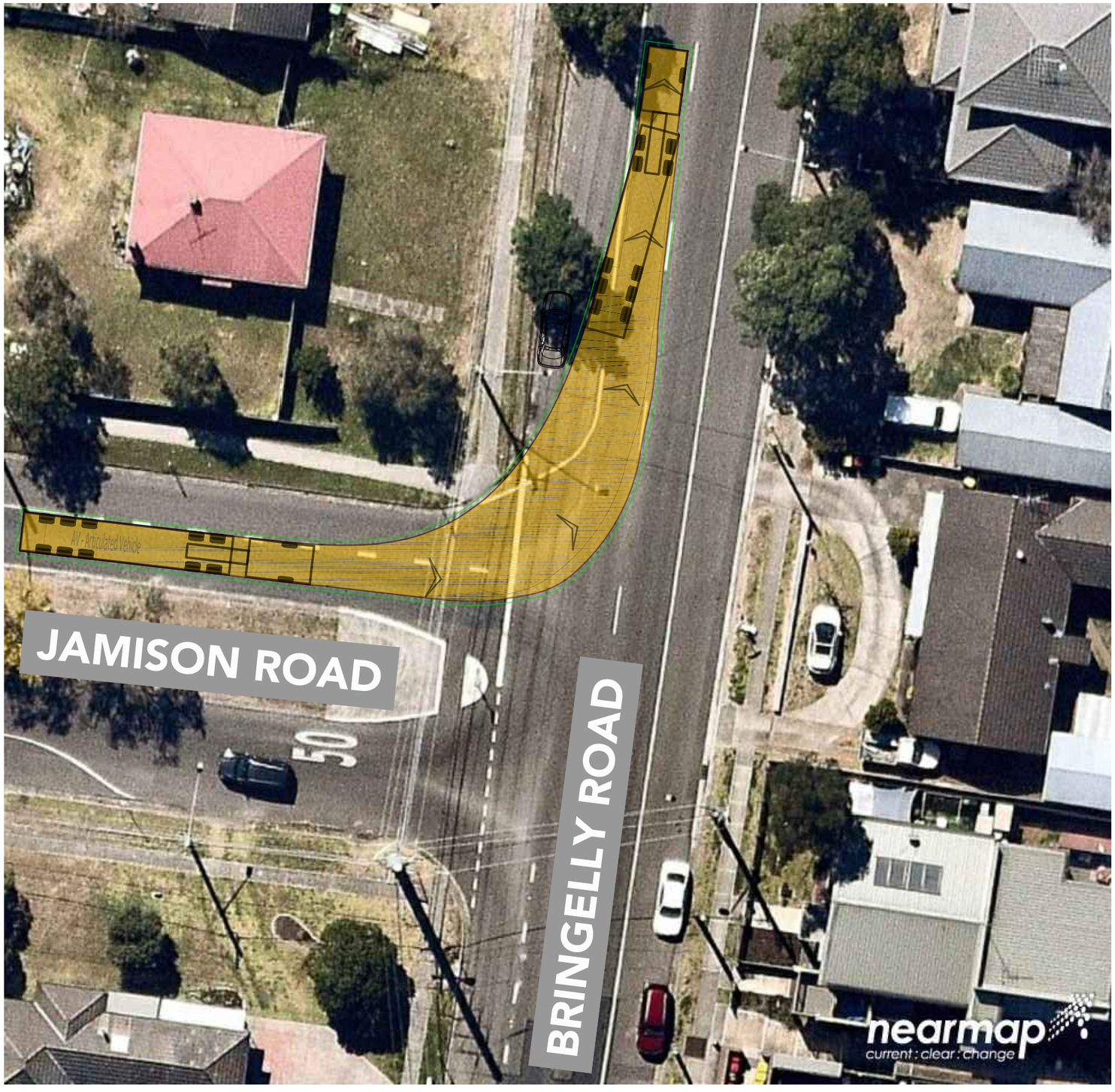
DRG. #: **PTC-003**

PROJECT #: **T2-2271**

SCALE: **1:500**

REV: **1**

1/1218 - PTC - Nepean Hospital - Truck Routes (Early Works).dwg



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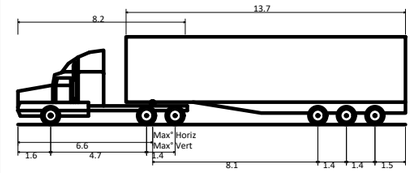

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Suite 102, 506 Miller Street,
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ptcconsultants.co

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1	14/12/17	FOR INFORMATION	HL	AU					

PROJECT:

NEPEAN HOSPITAL & INTEGRATED AMBULATORY SERVICES REDEVELOPMENT - CONCEPT & STAGE 1 SSDA

DRAWING TITLE:

SWEPT PATH ANALYSIS 19M ARTICULATED VEHICLE

JAMISON RD / BRINGELLY RD

CLIENT: **CBRE PTY LTD**

DRG. #: **PTC-004**

PROJECT #: **T2-2271**

SCALE: **1:300**

REV: **1**

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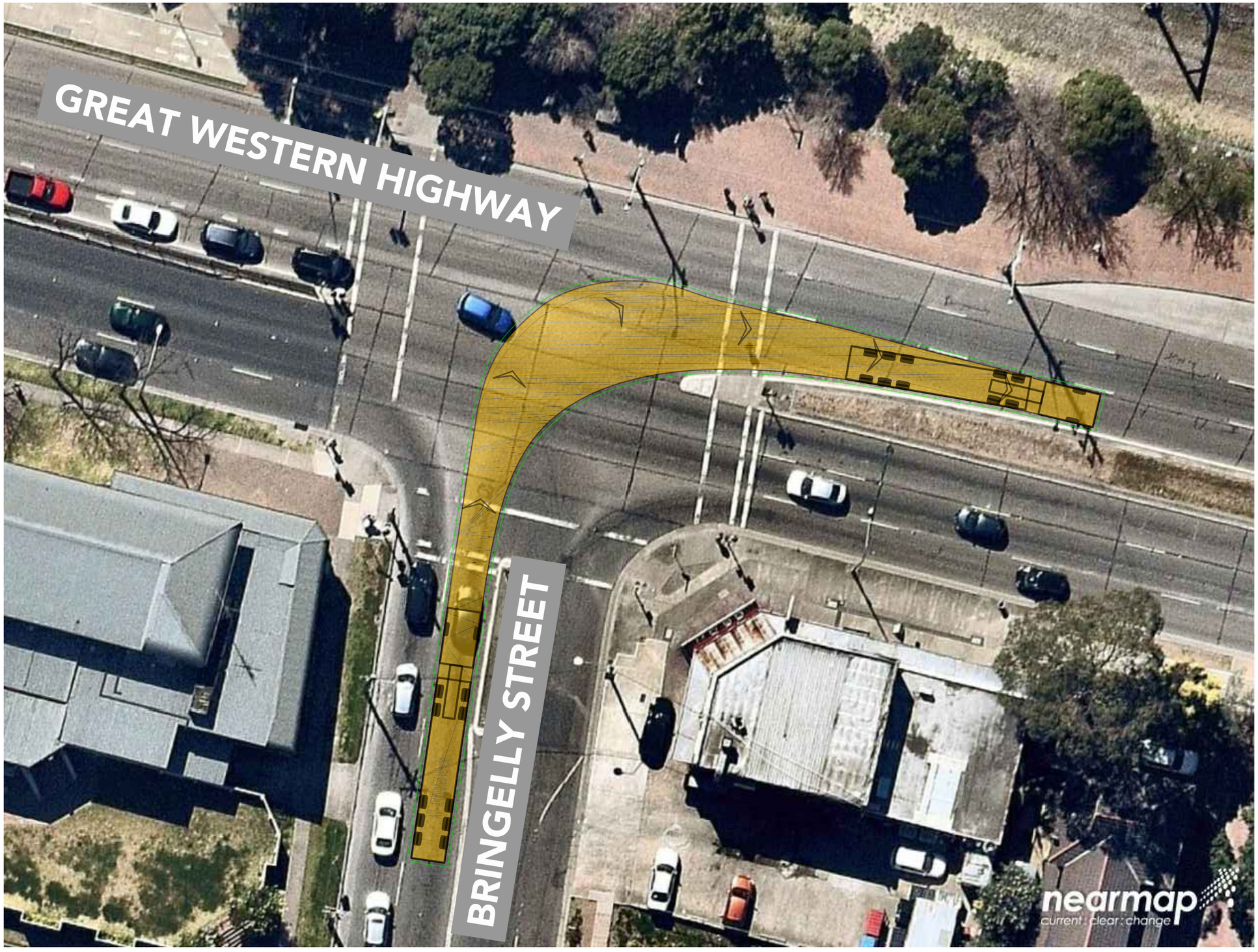

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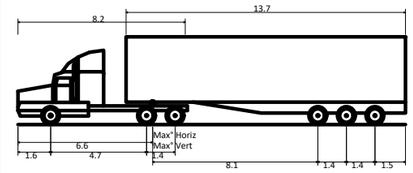

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ptc.
Suite 102, 506 Miller Street,
Cammeray NSW 2062
t +61 2 8920 0800
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1	14/12/17	FOR INFORMATION	HL	AU					

PROJECT:
NEPEAN HOSPITAL & INTEGRATED AMBULATORY SERVICES REDEVELOPMENT - CONCEPT & STAGE 1 SSDA

DRAWING TITLE:
SWEPT PATH ANALYSIS
19M ARTICULATED VEHICLE

GREAT WESTERN HWY/BRINGELLY RD

CLIENT: **CBRE PTY LTD**
DRG. #: **PTC-005**
PROJECT #: **T2-2271**
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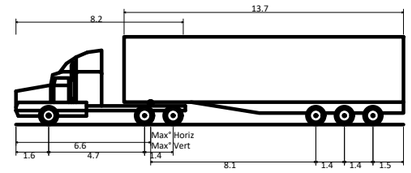

AV - Articulated Vehicle	
Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

The turning paths illustrated in this drawing have been prepared using the Autotrack vehicle modelling software in conjunction with AutoCAD. The vehicle model was prepared by Analytico Pty Ltd based upon vehicle data provided by Austroads. While this modelling represents a conservative assessment of the vehicles ability, it is not possible to account for all vehicle types/characteristics or driver ability.

ptc.
Suite 102, 506 Miller Street,
Cammeray NSW 2062
t +61 2 8920 0800
ptcconsultants.co

REV	DATE	COMMENT	DRAWN	REVIEWED
1	14/12/17	FOR INFORMATION	HL	AU

REV	DATE	COMMENT	DRAWN	REVIEWED

PROJECT:
NEPEAN HOSPITAL & INTEGRATED AMBULATORY SERVICES REDEVELOPMENT - CONCEPT & STAGE 1 SSDA

DRAWING TITLE:
SWEPT PATH ANALYSIS
19M ARTICULATED VEHICLE

WESTERN HWY / THE NORTHERN RD

CLIENT: **CBRE PTY LTD**
DRG. #: **PTC-006**
PROJECT #: **T2-2271**
SCALE: **1:300**

REV: **1**

Attachment 2 Correspondence with Penrith City Council

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Shana Cai <shana.cai@parkingconsultants.com>

Fwd: Penrith City Council Contact

Abdullah Uddin <abdullah.uddin@ptcconsultants.co> 14 March 2019 at 11:09
To: Hamish Dodson <hamish.dodson@penrith.city>
Cc: "Elmes, Max" <Max.Elmes@cpbcon.com.au>, Shana Cai <shana.cai@ptcconsultants.co>

Hi Hamish

Thanks for your response. We don't envisage any significant changes to the CTMP.

Will contact RMS and TMC soon.

Kind regards,

Abdullah Uddin
Senior Traffic Engineer

ptc.

m +61 425 478 650
t +61 2 8920 0800

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Cammeray NSW 2062

parking;
traffic;
civil design;
wayfinding;
ptc.

Latest blog post: How do you feel about losing 5.7 days per year due to congestion?

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On Tue, 12 Mar 2019 at 15:09, Hamish Dodson <hamish.dodson@penrith.city> wrote:

> Hi Abdullah
>
> I believe that the original review and acceptance by Councils officers would be considered consultation.
>
> Unless there are changes that have been made to the CTMP since this time, no further review or comment is required by Council.

For RMS contacts the following 2 officers within the TMC would be the best to contact. Unfortunately I don't have contact numbers available on hand at the moment.

Chris.Goudanas@tmc.transport.nsw.gov.au

Isabel.MALAS@tmc.transport.nsw.gov.au

Regards

Hamish Dodson
Infrastructure Officer

E hamish.dodson@penrith.city
T +612 4732 7550 | F +612 4732 7958 | M +61481 438 588
PO Box 60, PENRITH NSW 2751
www.visitpenrith.com.au
www.penrithcity.nsw.gov.au

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From: Abdullah Uddin [mailto:abdullah.uddin@ptcconsultants.co]
Sent: Tuesday, March 12, 2019 2:23 PM
To: Hamish Dodson <hamish.dodson@penrith.city>
Subject: Re: Penrith City Council Contact

Hi Hamish

Thanks for getting back to me.

As advised, we have prepared the initial CTMP which I believe Council has reviewed already (see attached). Now as per the DA consent by DPE, we need to update the current CTMP with consultation with Council.

I guess two ways to go forward, you can reply me back stating that you have no further comments to add on the current CTMP. Alternatively, if you/ your colleague may wish to discuss further on any particular traffic & parking issue. We can discuss over the phone or even come to Council to have a face to face meeting. Please let me know whichever option you prefer.

In a different note, do you have the RMS representative's contact details who looks after the Penrith area (who generally attends the Local Traffic Committee meeting). I need to consult with RMS as well.

Kind regards,

Abdullah Uddin

Senior Traffic Engineer

m +61 425 478 650
t +61 2 8920 0800

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Latest blog post: Integrated multi-modal trip planner

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On Tue, 12 Mar 2019 at 14:05, Hamish Dodson <hamish.dodson@penrith.city> wrote:

> Hi Abdullah
>
> Although I do look at CTMP's if its related to a condition for a development application these typically get received by Councils Development Services Department in the first instance and an internal referral will be sent to my department.
>
> Now with state significant developments I'm a bit unsure it these go through the same standard processes or not.
>
> I would suggest e-mailing the CTMP directly to Councils generic e-mail at council@penrith.city so the CTMP can be registered in Council records. Then it will be forwarded to an appropriate Council officer.
>
> Regards

Hamish Dodson
Infrastructure Officer

E hamish.dodson@penrith.city
T +612 4732 7550 | F +612 4732 7958 | M +61481 438 588
PO Box 60, PENRITH NSW 2751
www.visitpenrith.com.au
www.penrithcity.nsw.gov.au

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CITY COUNCIL

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From: Abdullah Uddin [mailto:abdullah.uddin@ptcconsultants.co]
Sent: Monday, March 11, 2019 10:26 AM
To: Hamish Dodson <hamish.dodson@penrith.city>
Cc: Elmes, Max <Max.Elmes@cpbcon.com.au>; Shana Cai <shana.cai@ptcconsultants.co>
Subject: Fwd: Penrith City Council Contact

Good morning Hamish

I have got your contact details from Max Elmes of CPB Contractors in regards to Nepean Hospital development. We have prepared the initial Construction Traffic Management Plan (CTMP) for the main hospital development and as per the development consent by Department of Planning and Environment, we need to update the CTMP with consultation with the relevant road authorities.

Are you the right person to discuss about this? If not, do you mind sending me the contact details of the Council's Traffic Engineer who is dealing with this project.

Kind regards,

Abdullah Uddin
Senior Traffic Engineer

Image removed by sender.

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t +61 2 8920 0800

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Cammeray NSW 2062

Latest blog post: Integrated multi-modal trip planner

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---------- Forwarded message ---------
From: **Elmes, Max** <Max.Elmes@cpbcon.com.au>
Date: Fri, 8 Mar 2019 at 17:16
Subject: Penrith City Council Contact
To: Abdullah Uddin <abdullah.uddin@ptcconsultants.co>

Hamish Dodson
Infrastructure Officer

E hamish.dodson@penrith.city
T +612 4732 7550 | F +612 4732 7958 | M +61481 438 588
PO Box 60, PENRITH NSW 2751
www.visitpenrith.com.au
www.penrithcity.nsw.gov.au

Error! Filename not specified.

Regards

Max Elmes

Project Engineer

Error! Filename not specified.

End of Barber Ave, KINGSWOOD, NSW, 2747,

T **M** 0427 123 864

E Max.Elmes@cpbcon.com.au

cpbcon.com.au

Error! Filename not specified.

[Quoted text hidden]

Attachment 3 Correspondence with TfNSW

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Shana Cai <shana.cai@parkingconsultants.com>

Nepean Main Hospital Development CTMP

Ozinga, Mark <Mark.Ozinga@transport.nsw.gov.au> 22 March 2019 at 13:55
To: Abdullah Uddin <abdullah.uddin@ptcconsultants.co>
Cc: "Elmes, Max" <Max.Elmes@cpbcon.com.au>, Shana Cai <shana.cai@ptcconsultants.co>

Hi Abdullah.

Thanks for taking my call earlier this afternoon.

Just to confirm, TfNSW does not need to provide comment on this occasion.

You should continue to liaise with RMS. You mentioned that you had already consulted with Council.

Mark

Mark Ozinga
Principal Manager Land Use Planning & Development
Freight, Strategy & Planning Division

Transport for NSW

T 0439 489 298
Level 26, 477 Pitt Street, Haymarket, NSW, 2008

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Shana Cai <shana.cai@parkingconsultants.com>

Nepean Main Hospital Development CTMP

Abdullah Uddin <abdullah.uddin@ptcconsultants.co> 14 March 2019 at 16:56
To: Mark.Ozinga@transport.nsw.gov.au
Cc: "Elmes, Max" <Max.Elmes@cpbcon.com.au>, Shana Cai <shana.cai@ptcconsultants.co>

Good afternoon Mark

I have obtained your contact details from my ex colleague in TfNSW. I have been suggested to send an email to development@transport.nsw.gov.au but my situation is bit different, hence writing to you directly.

We have prepared the initial Construction Traffic Management Plan (CTMP) for Nepean main hospital development and as per the development consent by Department of Planning and Environment, we need to update the CTMP with consultation with the relevant road authorities.

I have attached the initial CTMP for your information. I believe TfNSW has already reviewed this CTMP.

I will call to discuss further.

Kind regards,

Abdullah Uddin
Senior Traffic Engineer

ptc.

m +61 425 478 650
t +61 2 8920 0800

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Latest blog post: How do you feel about losing 5.7 days per year due to congestion?

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18 11 13 - ptc. - Nepean Hospital - Stage 1 Building CTMP (includes SEARs).pdf
2754K

ptc.

Shana Cai <shana.cai@parkingconsultants.com>

Re: Nepean Hospital CTMP

Ho, Ken <Ken.Ho@transport.nsw.gov.au> 22 March 2019 at 13:50
To: Abdullah Uddin <abdullah.uddin@ptcconsultants.co>
Cc: "Elmes, Max" <Max.Elmes@cpbcon.com.au>, Shana Cai <shana.cai@ptcconsultants.co>

Hi Abdullah,

Thanks for consulting on the CTMP.

The CTMP was reviewed and I have no issues to raise.

It is advised that Council and Roads and Maritime Services should be consulted on the CTMP, per requirements of the condition of consent (the relevant roads authorities).

Regards,

Ken Ho
Transport Planner

Freight, Strategy & Planning
Transport for NSW

L26 477 Pitt Street, Haymarket NSW 2000

Use public transport... plan your trip at transportnsw.info

Get on board with Opal at opal.com.au

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[Quoted text hidden]

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Shana Cai <shana.cai@parkingconsultants.com>

Re: Nepean Hospital CTMP

Abdullah Uddin <abdullah.uddin@ptcconsultants.co> 22 March 2019 at 13:26
To: "Ho, Ken" <Ken.Ho@transport.nsw.gov.au>
Cc: "Elmes, Max" <Max.Elmes@cpbcon.com.au>, Shana Cai <shana.cai@ptcconsultants.co>

Hi Ken

Please find attached the conditions (see condition B22 (b))

Kind regards,

Abdullah Uddin
Senior Traffic Engineer

ptc.

m +61 425 478 650
t +61 2 8920 0800

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On Fri, 22 Mar 2019 at 12:33, Ho, Ken <Ken.Ho@transport.nsw.gov.au> wrote:

> Hi Abdullah,
>
> May you please forward me the specific consent condition you are seeking to satisfy with the below?
>
> Regards,
>
> Ken

From: Abdullah Uddin [mailto:abdullah.uddin@ptcconsultants.co]
Sent: Friday, 22 March 2019 8:44 AM
To: Ho, Ken
Cc: Elmes, Max
Subject: Nepean Hospital CTMP

Good morning Ken

I have obtained your contact details in DPE website in regards to Nepean Hospital development. We have prepared the initial Construction Traffic Management Plan (CTMP) for the main hospital development and as per the development consent by the DPE, we need to update the CTMP with consultation with the relevant road authorities.

I have attached the initial CTMP for your information. I am not seeking any approval of the CTMP, rather want to discuss whether TfNSW has any issues in updating the original CTMP. Your earliest comments would be appreciated.

Please feel free to call if you wish to discuss further.

Kind regards,

Abdullah Uddin
Senior Traffic Engineer

ptc.

m +61 425 478 650
t +61 2 8920 0800

LinkedIn

Suite 102, 506 Miller Street
Cammeray NSW 2062

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traffic;
civil design;
wayfinding;
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265K

Attachment 4 Correspondence with RMS

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---------- Forwarded message ---------
From: **RAVICHELVAN Brana** <brana.ravichelvan@rms.nsw.gov.au>
Date: Mon, 8 Apr 2019 at 09:14
Subject: FW: Nepean Main Hospital Development - CTMP
To: abdullah.uddin@ptcconsultants.co <abdullah.uddin@ptcconsultants.co>

Apologies, spelt the email incorrectly.

From: RAVICHELVAN Brana
Sent: Monday, 8 April 2019 9:13 AM
To: 'abdullah.udin@ptcconsultants.co'
Cc: LANCE David C
Subject: RE: Nepean Main Hospital Development - CTMP

Hi Abdullah,

We've reviewed the CTMP and don't have any major concerns. We note that TCP will be prepared in due course – has this been started, or were you awaiting our response before preparing this?

Please send through a copy once available.

Thank you,
Brana

Brana Ravichelvan
Network and Safety Officer West
Network Sydney | Journey Management
T 02 8843 3338 **M** 04 5577 5187
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 5 27 Argyle Street Parramatta NSW 2150

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Shana Cai <shana.cai@parkingconsultants.com>

Nepean Main Hospital Development - CTMP

Abdullah Uddin <abdullah.uddin@ptcconsultants.co> 5 April 2019 at 14:59
To: David.LANCE@rms.nsw.gov.au
Cc: "Elmes, Max" <Max.Elmes@cpbcon.com.au>, Shana Cai <shana.cai@ptcconsultants.co>

Hi David

I just left a message to your phone.

Could you please respond to this email as the construction work is currently on hold for the RMS comment/s on this CTMP. Once again, we are not seeking any RMS conditions on this CTMP, rather would like to get your opinion (if any) in preparation of this CTMP.

Happy to come to your office at your convenient date/ time and explain the project/ our report in detail so that you don't have to go through the whole report.

I look forward to hearing from you soon.

Kind regards,

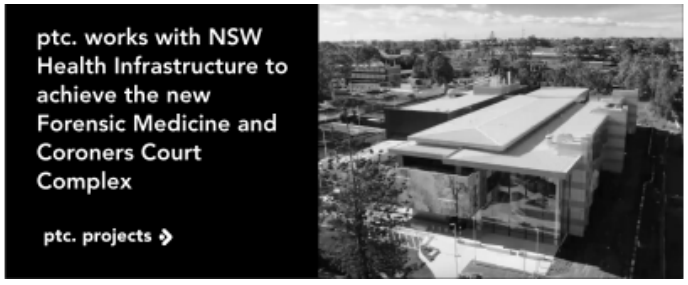
Abdullah Uddin
Senior Traffic Engineer

ptc.

m +61 425 478 650
t +61 2 8920 0800

LinkedIn

Suite 102, 506 Miller Street
Cammeray NSW 2062



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traffic;
civil design;
wayfinding;
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Latest blog post: Australian shoppers want more parking

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[Quoted text hidden]

Attachment 5 Notification Email to TMC

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Shana Cai <shana.cai@parkingconsultants.com>

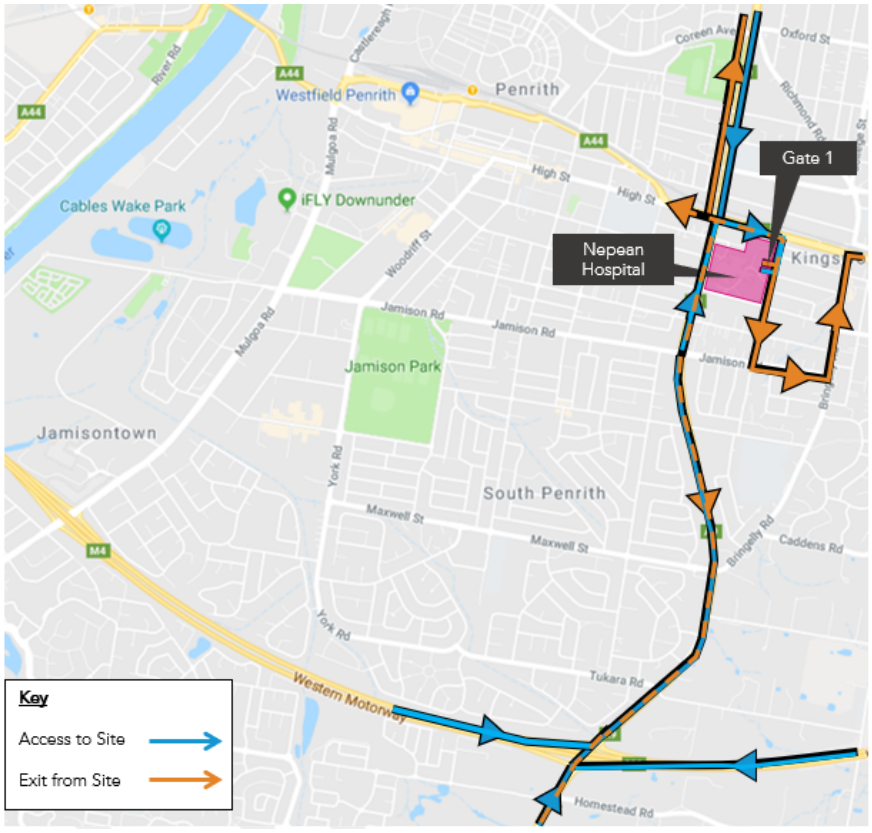
Nepean Hospital Construction Traffic Managmenet Plan (CTMP)

Abdullah Uddin <abdullah.uddin@ptcconsultants.co> 25 March 2019 at 10:18
To: Chris.Goudanas@tmc.transport.nsw.gov.au, Isabel.MALAS@tmc.transport.nsw.gov.au
Cc: Shana Cai <shana.cai@ptcconsultants.co>

Good morning Chris/ Isabel

I have got your contact details from Penrith Council in regards to Nepean Hospital development. We have prepared the initial Construction Traffic Management Plan (CTMP) for the main hospital development and as per the development consent we need to inform TMC truck routes for the waste material transport (see attached condition B32).

See below the truck routes for waste material transport. Please feel free to contact us if you have any questions.



Kind regards,

Abdullah Uddin
Senior Traffic Engineer

ptc.

m +61 425 478 650
t +61 2 8920 0800

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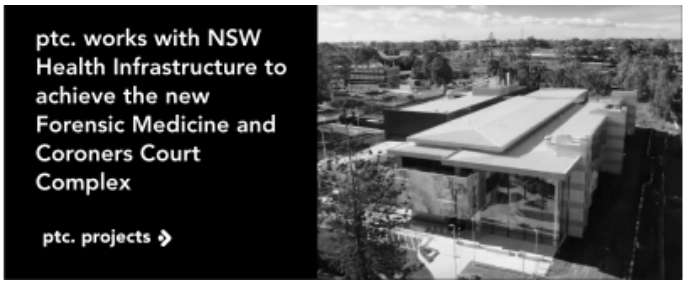
Cammeray NSW 2062



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Attachment 6 Reversing Swept Path Analysis 19 meter Articulated Vehicle

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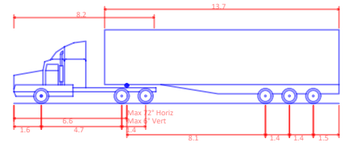
comments | A3

VEHICLE PROFILES



AV - Articulated Vehicle	
Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	12.500m

Disclaimer: This is not a TCP. This drawing has been prepared for illustrative purposes only. A TCP would be required to be prepared by the traffic management contractor.

Traffic controllers are required for truck manouver

3.0m buffer zone including scaffolding and barriers

REFER TO BULK EARTHWORKS PLAN ON SHEET 0000101

REFER TO SHEET NHR-BON-DRW-CIV-TB1-ALL-0000402 FOR PECC COURTYARD DETAILS

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
2	25.03.20	For Review	JM	DS
1	23.03.20	For Review	JM	SW

project
Nepean Hospital Construction
Traffic & Pedestrian Management Plan

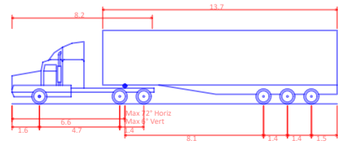
drawing title
Reversing 19m AV Swept Path - Entry

client	CPB Contractors
drawing #	ptc-001
project #	2254O
scale	1 : 500

rev 2

comments | A3

VEHICLE PROFILES



AV - Articulated Vehicle	
Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	12.500m

Disclaimer: This is not a TCP. This drawing has been prepared for illustrative purposes only. A TCP would be required to be prepared by the traffic management contractor.

3.0m buffer zone including scaffolding and barriers

Traffic controllers are required for truck manouver

REFER TO BULK EARTHWORKS PLAN ON SHEET 0000101

REFER TO SHEET NHR-BON-DRW-CIV-TB1-ALL-0000402 FOR PECC COURTYARD DETAILS

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Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
2	25.03.20	For Review	JM	DS
1	23.03.20	For Review	JM	SW

project
Nepean Hospital Construction
Traffic & Pedestrian Management Plan

drawing title
Reversing 19m AV Swept Path - Exit

client	CPB Contractors
drawing #	ptc-002
project #	2254O
scale	1 : 500

rev 2

Attachment 7 Swept Paths for Ambulance Car Park Demolition, Civil & Structural Works

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comments

A3

Existing Works Zone

Emergency Access Road

Access to be constructed concurrently with the demolition works

Proposed Works Zone

No stopping zone within 10m of kerbline as shown

Operational Access Road

RODGERS STREET

ORTH STREET

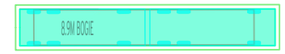
SOMERSET STREET

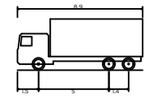
18000

23000

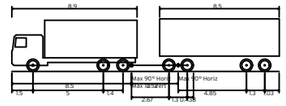
74000

10000

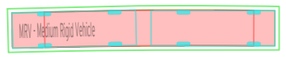


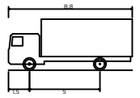


8.9M BOGIE	
Overall Length	8.900m
Overall Width	2.600m
Overall Body Height	3.632m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
Overall Length	19.000m
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.

Suite 502, 1 James Place
North Sydney NSW 2060

t +61 2 8920 0800

ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project

NEPEAN HOSPITAL REDEVELOPMENT

drawing title

WORK ZONES - DEMOLITION STAGE

client	CPB CONTRACTORS
drawing #	ptc-001
project #	2254Q
scale	NTS

rev 1

Existing Works Zone

RODGERS STREET

18000

Emergency Access Road

23000

Access has been constructed and is in used for civil/ structural works

Proposed Works Zone

ORTH STREET

54000

SOMERSET STREET

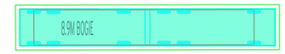
No stopping zone within 10m of kerbline as shown

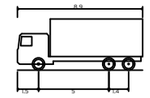
10000

Operational Access Road

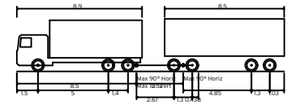
comments

A3

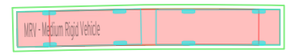


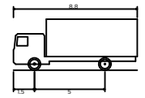


8.9M BOGIE	
Overall Length	8.900m
Overall Width	2.600m
Overall Body Height	3.632m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
Overall Length	19.000m
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





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Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

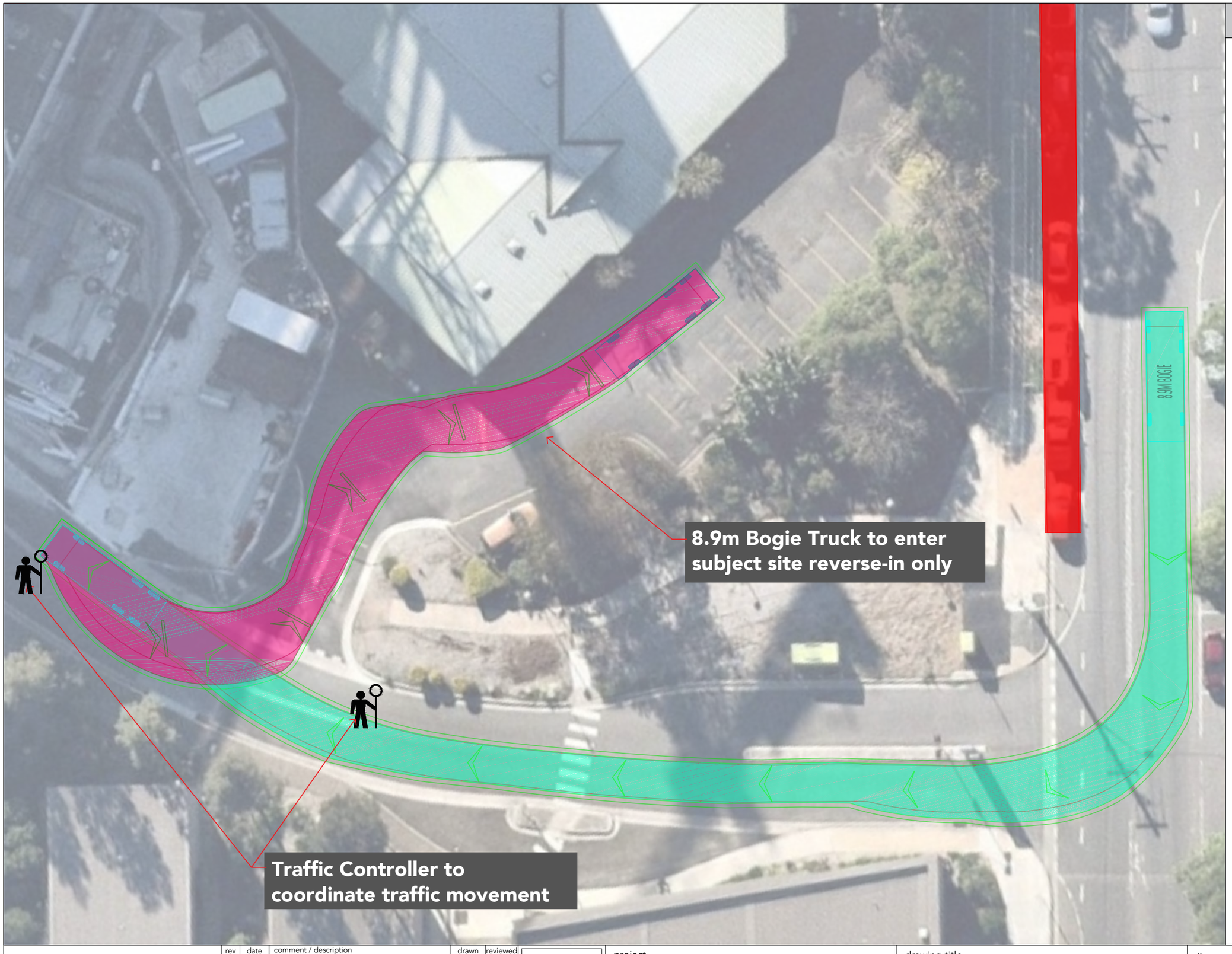
rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project
NEPEAN HOSPITAL REDEVELOPMENT

drawing title
WORK ZONES - CIVIL/ STRUCTURAL WORKS

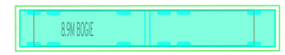
client	CPB CONTRACTORS
drawing #	ptc-001.2
project #	2254Q
scale	NTS

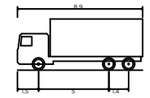
rev 1



comments

A3





8.9M BOGIE

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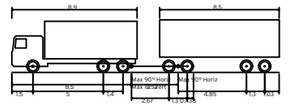
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



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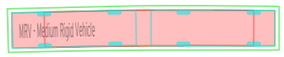

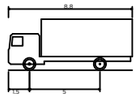

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Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project
NEPEAN HOSPITAL REDEVELOPMENT

drawing title
DEMOLITION STAGE
AMBULANCE BAY WORKS

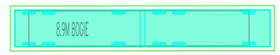
8.9m BOGIE TRUCK ENTRY SWEPT PATH

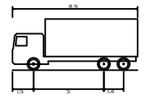
client	CPB CONTRACTORS
drawing #	ptc-002
project #	2254Q
scale	1 : 250

rev 1

comments

A3





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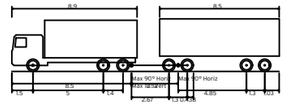

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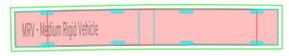

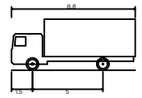

MRV - Medium Rigid Vehicle	
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Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

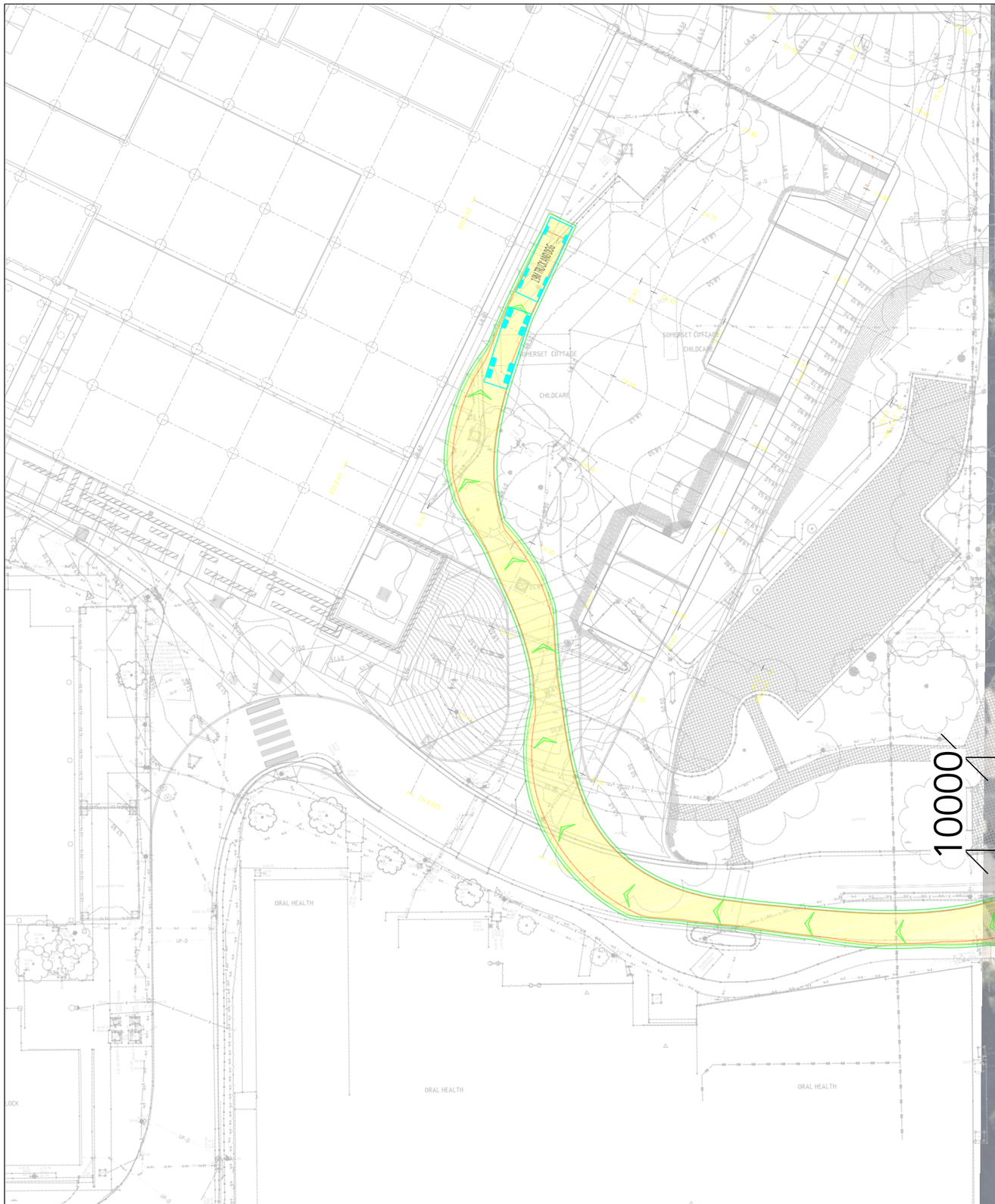
project
NEPEAN HOSPITAL REDEVELOPMENT

drawing title
DEMOLITION STAGE
AMBULANCE BAY WORKS

8.9m BOGIE TRUCK EXIT SWEPT PATH

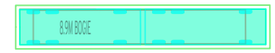
client	CPB CONTRACTORS
drawing #	ptc-003
project #	2254Q
scale	1 : 500

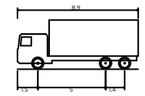
rev 1



comments

A3





8.9M BOGIE	
Overall Length	8.900m
Overall Width	2.600m
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Min Body Ground Clearance	0.427m
Track Width	2.500m
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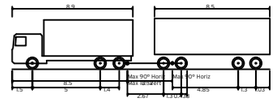

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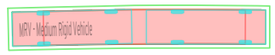
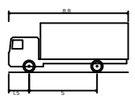




MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project
NEPEAN HOSPITAL REDEVELOPMENT

drawing title
STAGE 1 CIVIL WORKS
AMBULANCE BAY

19m TRUCK & DOG ENTRY SWEPT PATH

client	CPB CONTRACTORS
drawing #	ptc-004
project #	2254Q
scale	1 : 500

rev 1

Access has been constructed and is in used for civil/ structural works

54000

10000

SOMERSET STREET

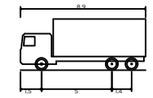
ORTH ST

Traffic Controller to coordinate traffic movements

comments

A3

8.9M BOGIE



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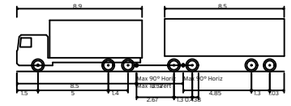
19M TRUCK AND DOG



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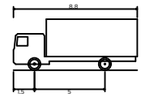
MRV - Medium Rigid Vehicle



MRV - Medium Rigid Vehicle	
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Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.

Suite 502, 1 James Place
North Sydney NSW 2060

t +61 2 8920 0800

ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project

NEPEAN HOSPITAL REDEVELOPMENT

drawing title

STAGE 1 CIVIL WORKS
AMBULANCE BAY

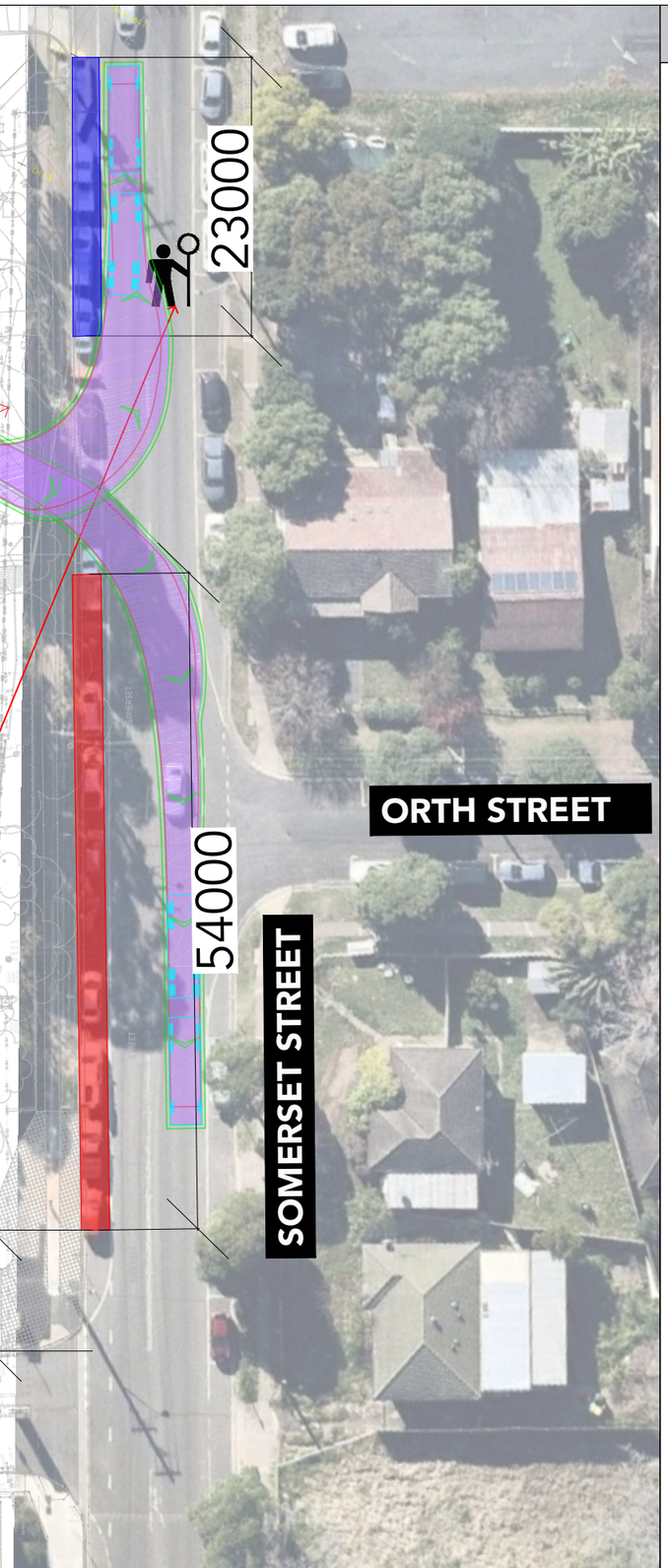
19m TRUCK & DOG EXIT SWEPT PATH 1

client	CPB CONTRACTORS
drawing #	ptc-005.1
project #	2254Q
scale	1 : 500

rev 1

Access has been constructed and is in used for civil/ structural works

Traffic Controller to coordinate traffic movements



comments

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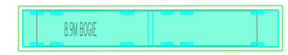

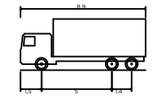

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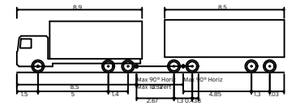

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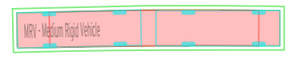

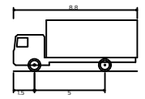

MRV - Medium Rigid Vehicle	
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Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project
NEPEAN HOSPITAL REDEVELOPMENT

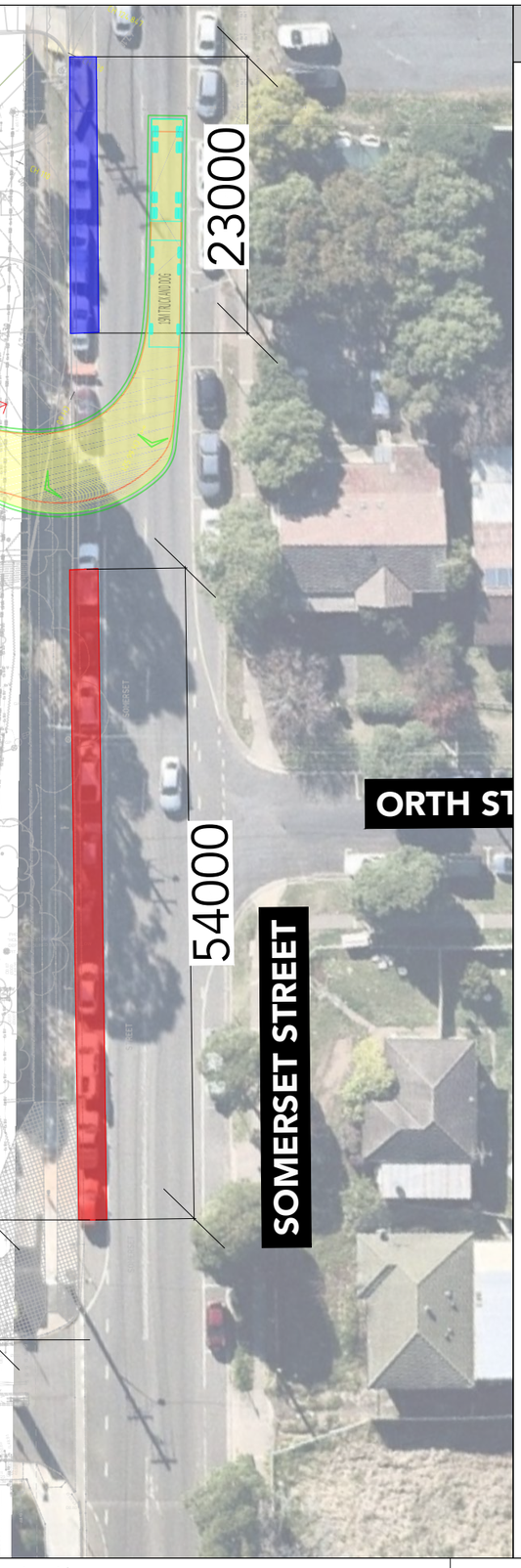
drawing title
STAGE 1 CIVIL WORKS
AMBULANCE BAY

19m TRUCK & DOG EXIT SWEPT PATH 2

client	CPB CONTRACTORS
drawing #	ptc-005.2
project #	2254Q
scale	1 : 250

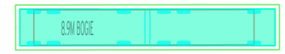
rev 1

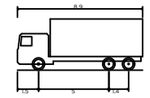
Access has been constructed and is in used for civil/ structural works



comments

A3





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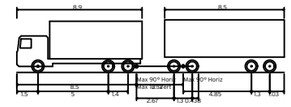
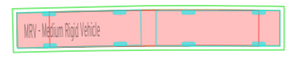
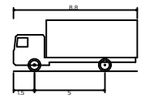
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
Overall Length	19.000m
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.

Suite 502, 1 James Place
North Sydney NSW 2060

t +61 2 8920 0800

ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project

NEPEAN HOSPITAL REDEVELOPMENT

drawing title

STAGE 2 CIVIL WORKS
AMBULANCE BAY

19m TRUCK & DOG ENTRY SWEPT PATH

client	CPB CONTRACTORS
drawing #	ptc-006
project #	2254Q
scale	1 : 250

rev 1

Access has been constructed and is in used for civil/ structural works

Traffic Controller to coordinate traffic movements

23000

54000

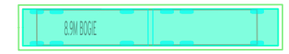
10000

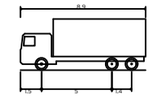
ORTH ST

SOMERSET STREET

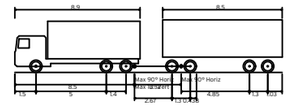
comments

A3

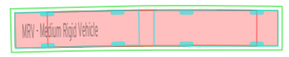


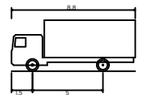


8.9M BOGIE	
Overall Length	8.900m
Overall Width	2.600m
Overall Body Height	3.632m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
Overall Length	19.000m
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.

Suite 502, 1 James Place
North Sydney NSW 2060

t +61 2 8920 0800

ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project

NEPEAN HOSPITAL REDEVELOPMENT

drawing title

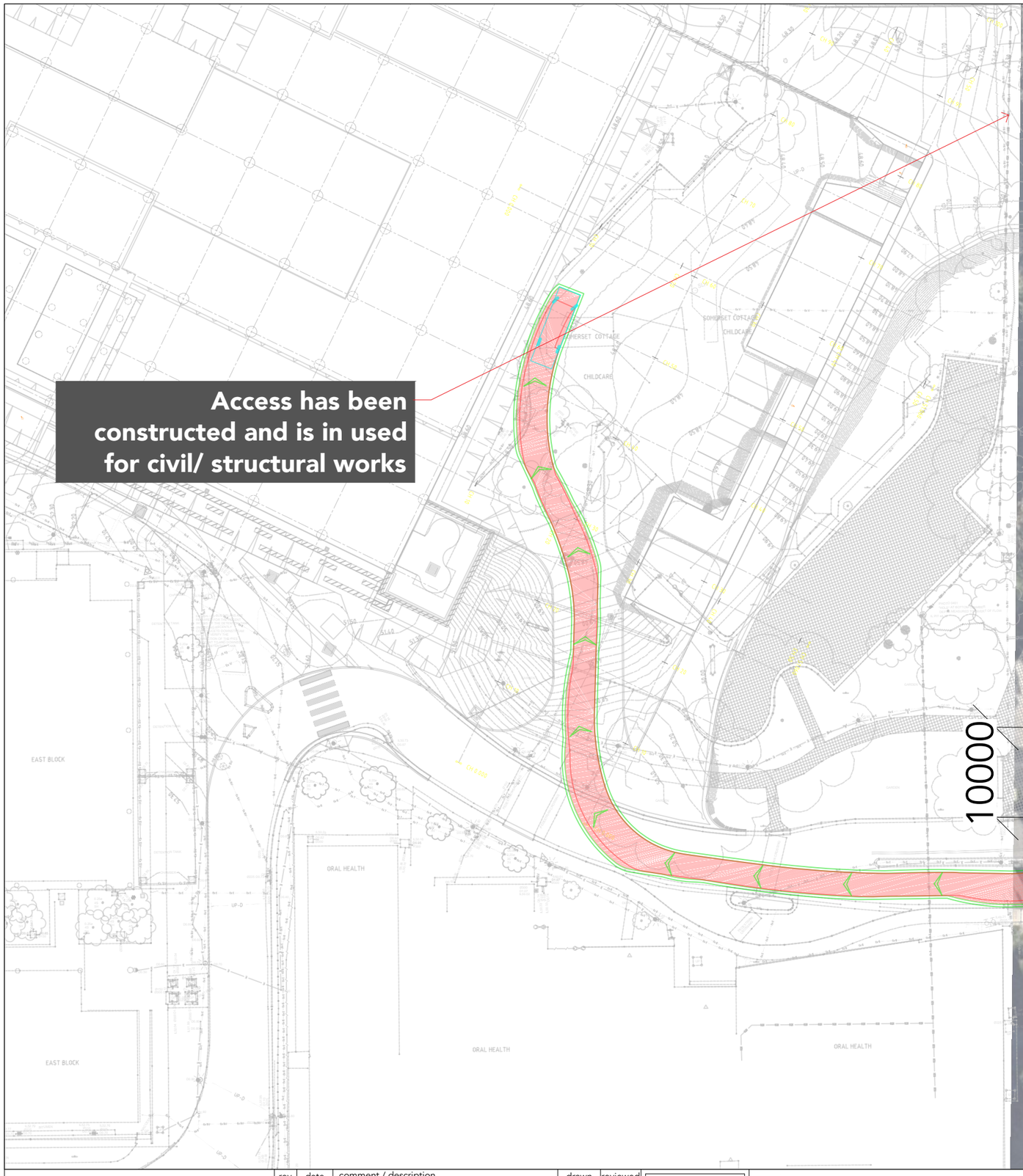
STAGE 2 CIVIL WORKS
AMBULANCE BAY

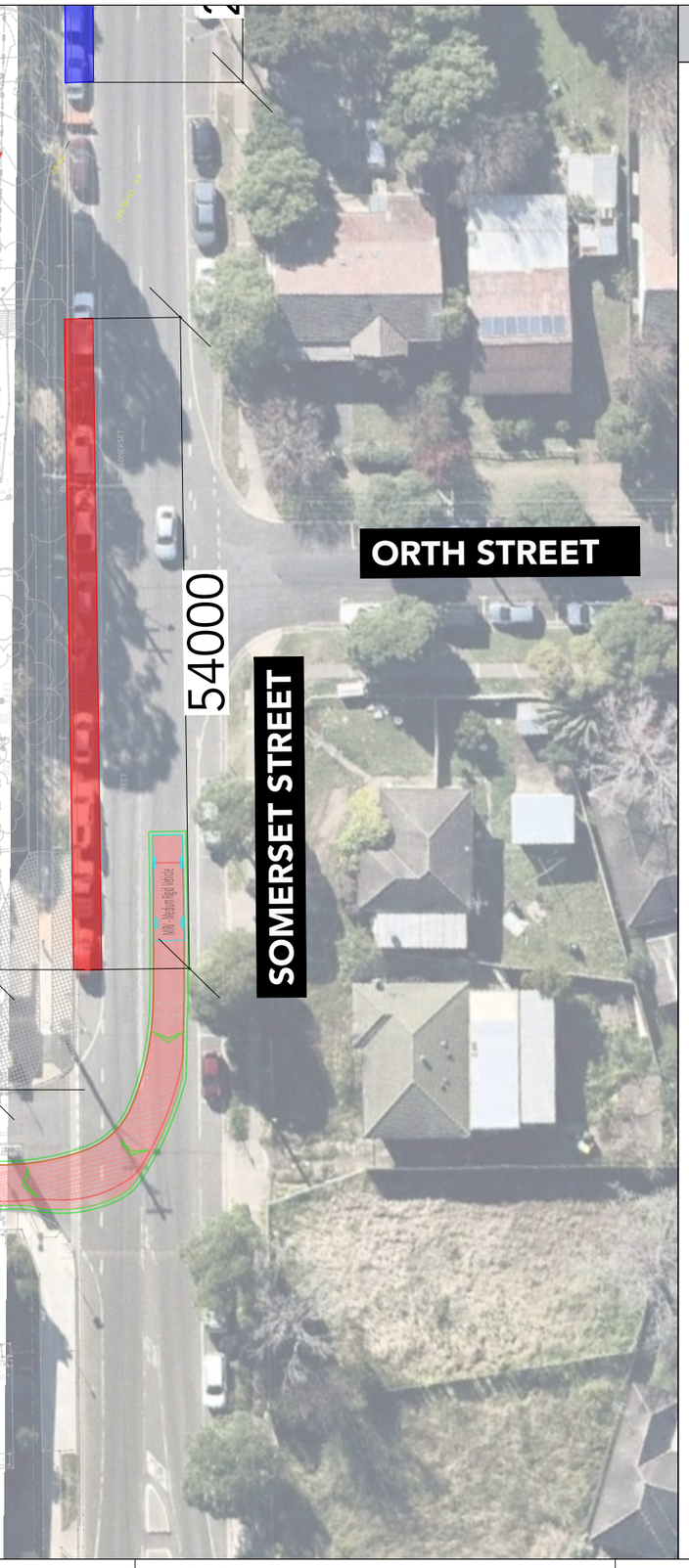
19m TRUCK & DOG EXIT SWEPT PATH

client	CPB CONTRACTORS
drawing #	ptc-007
project #	2254Q
scale	1 : 250

rev 1

Access has been constructed and is in used for civil/ structural works





comments

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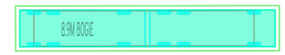
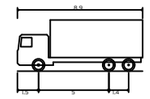
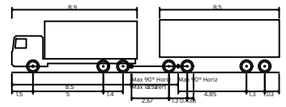
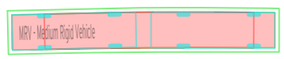


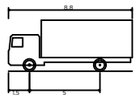


8.9M BOGIE	
Overall Length	8.900m
Overall Width	2.600m
Overall Body Height	3.632m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
Overall Length	19.000m
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project
NEPEAN HOSPITAL REDEVELOPMENT

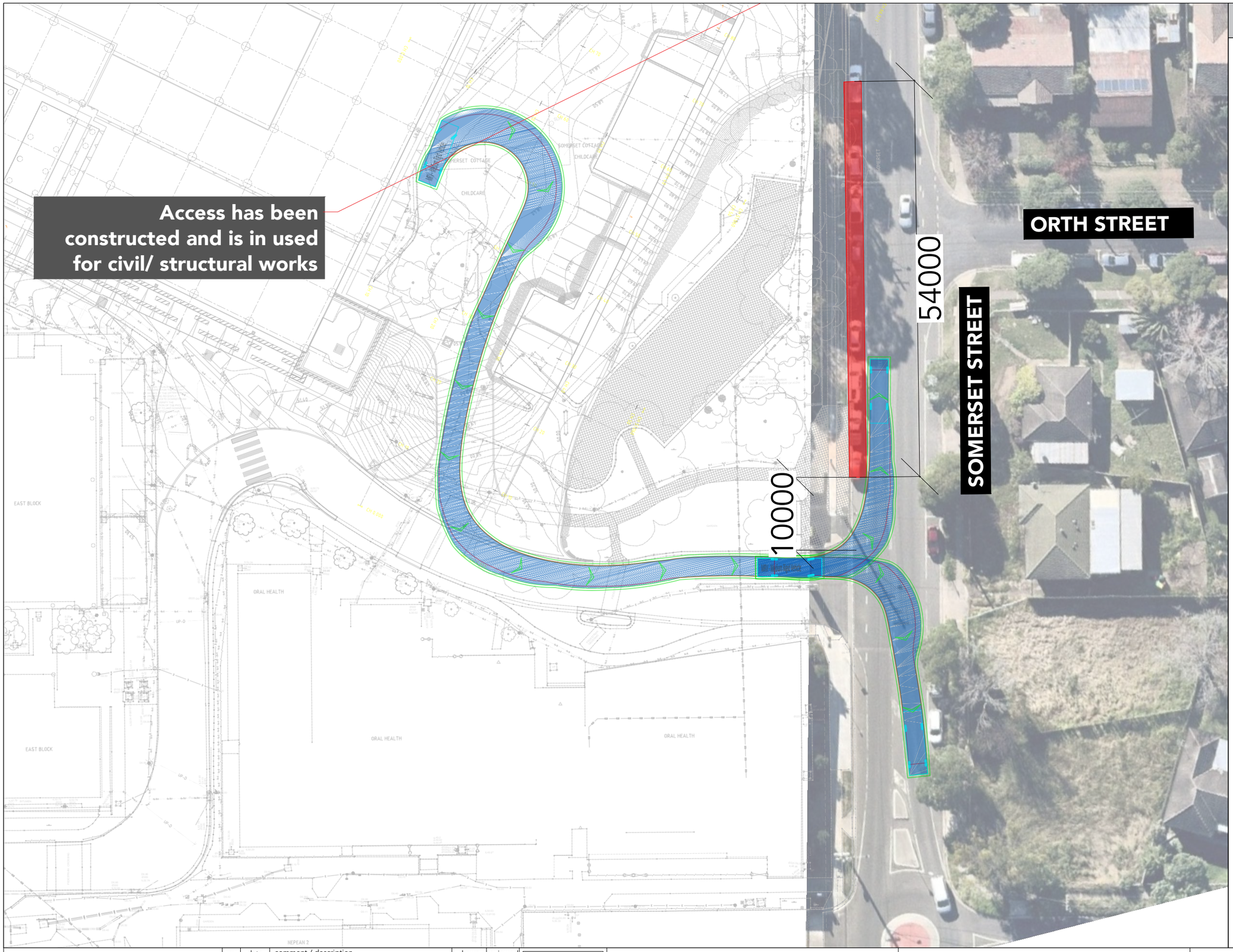
drawing title
STAGE 1 STRUCTURAL WORKS
AMBULANCE BAY

8.8m MRV ENTRY SWEPT PATH

client	CPB CONTRACTORS
drawing #	ptc-008
project #	2254Q
scale	1 : 500

rev 1

Access has been constructed and is in used for civil/ structural works



comments

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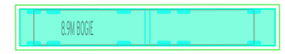
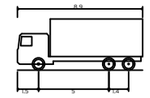
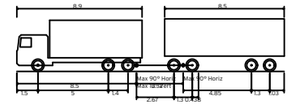
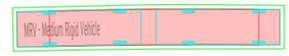


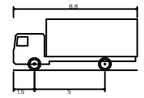


8.9M BOGIE	
Overall Length	8.900m
Overall Width	2.600m
Overall Body Height	3.632m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
Overall Length	19.000m
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project
NEPEAN HOSPITAL REDEVELOPMENT

drawing title
STAGE 1 STRUCTURAL WORKS
AMBULANCE BAY

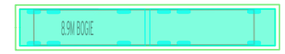
8.8m MRV EXIT SWEPT PATH 1

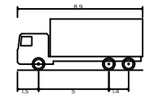
client	CPB CONTRACTORS
drawing #	ptc-009.1
project #	2254Q
scale	1 : 500

rev 1

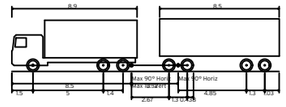
comments

A3





8.9M BOGIE	
Overall Length	8.900m
Overall Width	2.600m
Overall Body Height	3.632m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
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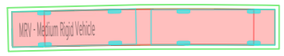
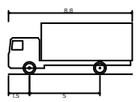
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.

Suite 502, 1 James Place
North Sydney NSW 2060

t +61 2 8920 0800

ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project

NEPEAN HOSPITAL REDEVELOPMENT

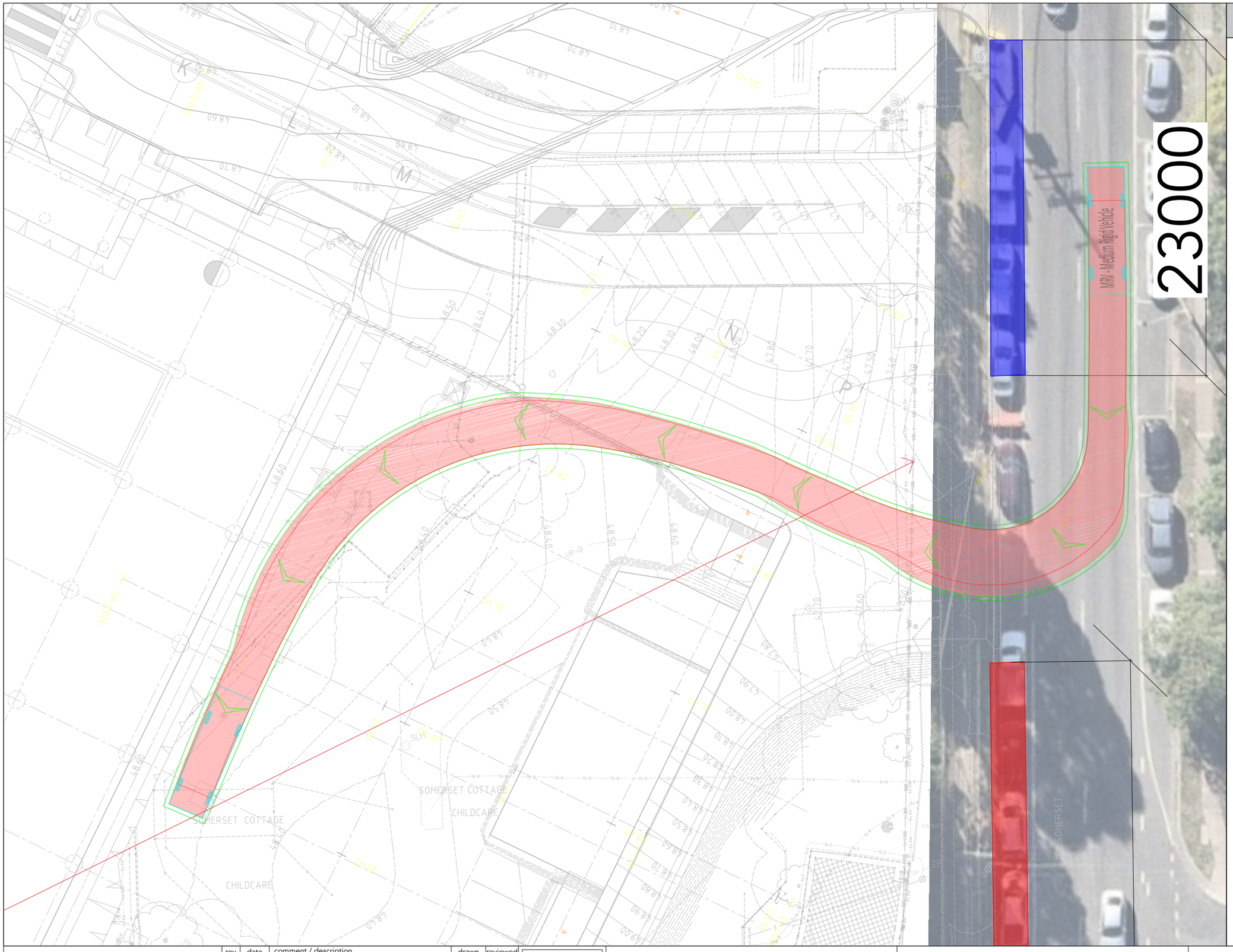
drawing title

STAGE 1 STRUCTURAL WORKS
AMBULANCE BAY

8.8m MRV EXIT SWEPT PATH 2

client	CPB CONTRACTORS
drawing #	ptc-009.2
project #	2254Q
scale	1 : 250

rev 1



comments

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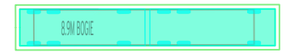
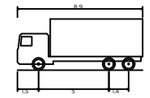
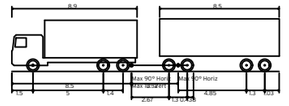




8.9M BOGIE	
Overall Length	8.900m
Overall Width	2.600m
Overall Body Height	3.632m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
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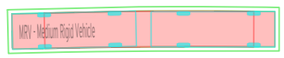
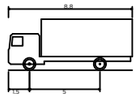
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

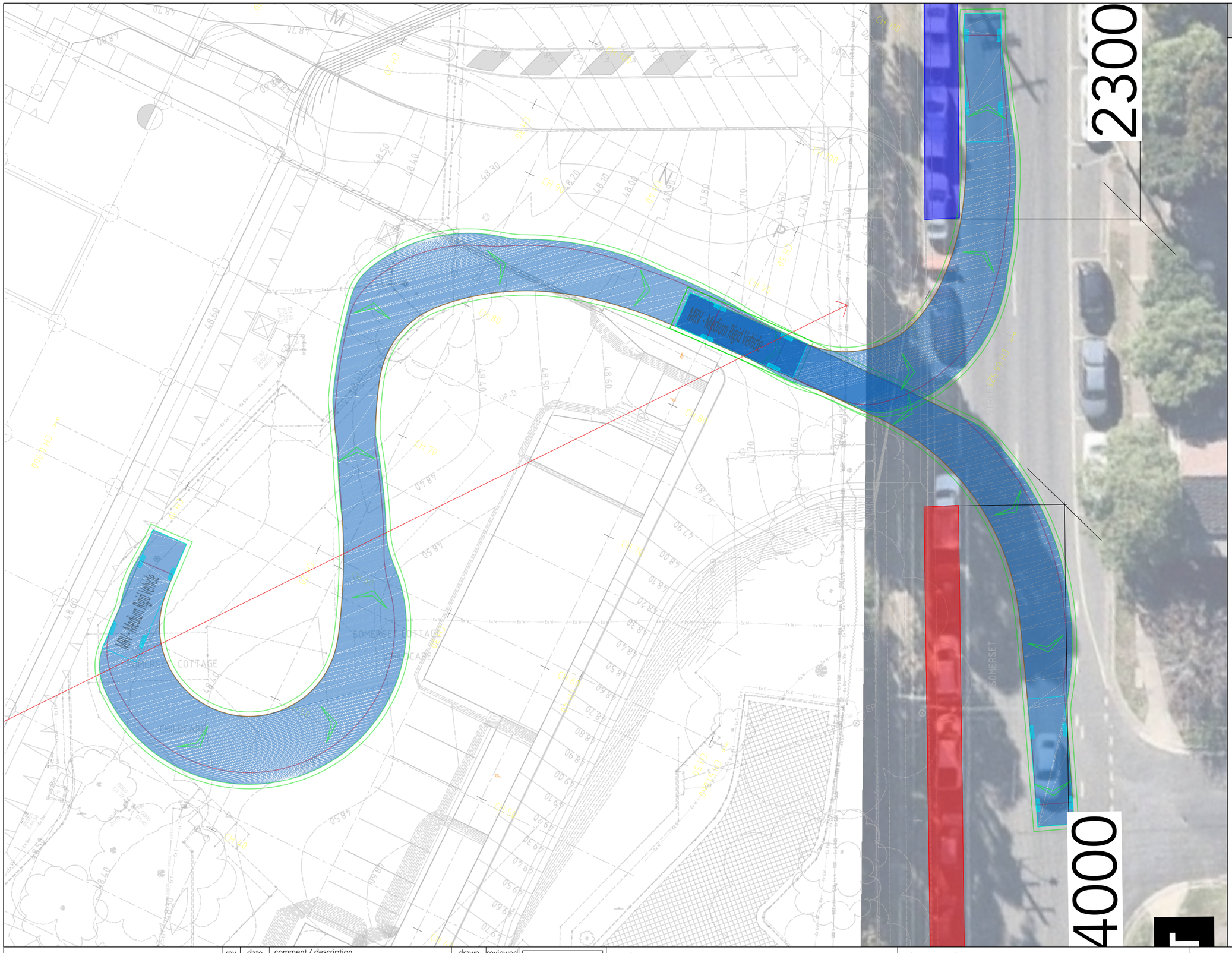
project
NEPEAN HOSPITAL REDEVELOPMENT

drawing title
STAGE 2 STRUCTURAL WORKS
AMBULANCE BAY

8.8m MRV ENTRY SWEPT PATH

client	CPB CONTRACTORS
drawing #	ptc-010
project #	2254Q
scale	1 : 250

rev 1



comments

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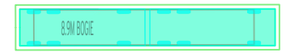

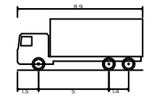

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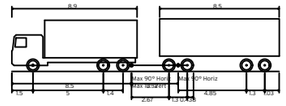
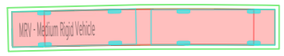
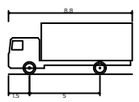
Overall Width	2.600m
Overall Body Height	3.632m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m



19M TRUCK AND DOG	
Overall Length	19.000m
Overall Width	2.600m
Overall Body Height	3.738m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	12.000m





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

Traffic Controller

Proposed Works Zone

Existing Works Zone

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 8920 0800
ptcconsultants.co

rev	date	comment / description	drawn	reviewed
1	16/07/20	FOR INFORMATION	CNL	SW

project
NEPEAN HOSPITAL REDEVELOPMENT

drawing title
STAGE 2 STRUCTURAL WORKS
AMBULANCE BAY

8.8m MRV EXIT SWEPT PATH

client	CPB CONTRACTORS
drawing #	ptc-011
project #	2254Q
scale	1 : 250

rev 1

7. Construction Noise and Vibration Subplan

MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

Nepean Hospital Stage 1

Construction Noise and Vibration Management Sub-Plan

SYDNEY
9 Sarah St
MASCOT NSW 2020
(02) 8339 8000

ABN 11 068 954 343
www.acousticlogic.com.au

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Project ID	20181654.2
Document Title	Construction Noise and Vibration Management
Attention To	CPB Contractors Pty Limited

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	15/03/2019	20181654.2/1503A/R0/AW	AW		AW
1	22/03/2019	20181654.2/2203A/R1/AW	AW		AW
2	15/08/2019	20181654.2/1508A/R2/AW	AW		AW
3	3/03/2020	20181654.2/0303A/R3/AW	AW		AW
		Reviewed – no changes			

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1 INTRODUCTION

Acoustic Logic Consultancy has been engaged to prepare a Noise and Vibration Management Sub-Plan to address noise and vibration impacts from demolition/excavation/construction associated with the Nepean Hospital Stage 1 Redevelopment. The report has been prepared to conditions related to construction noise within the development consent for SSD 8766.

The issues which will be addressed in this report are:

- Identification of potentially impacted nearby receivers.
- Identification of the noise and vibration standards which will be applicable to this project.
- Identify likely sources of noise and vibration generation and predicted noise levels at the nearby receivers.
- Formulation of a strategy to comply with the standards identified and mitigation treatments.

We note that the proposed construction hours include Saturday work from 7am to 5pm as prescribed by Condition C5 (SSD 8766), which is outside of what is typically considered to be standard construction hours. This report therefore includes an assessment of the noise impact specifically addressing work in the periods (which is held to more stringent noise emission criteria compared to typical construction works).

2 SITE DESCRIPTION AND PROPOSED WORKS

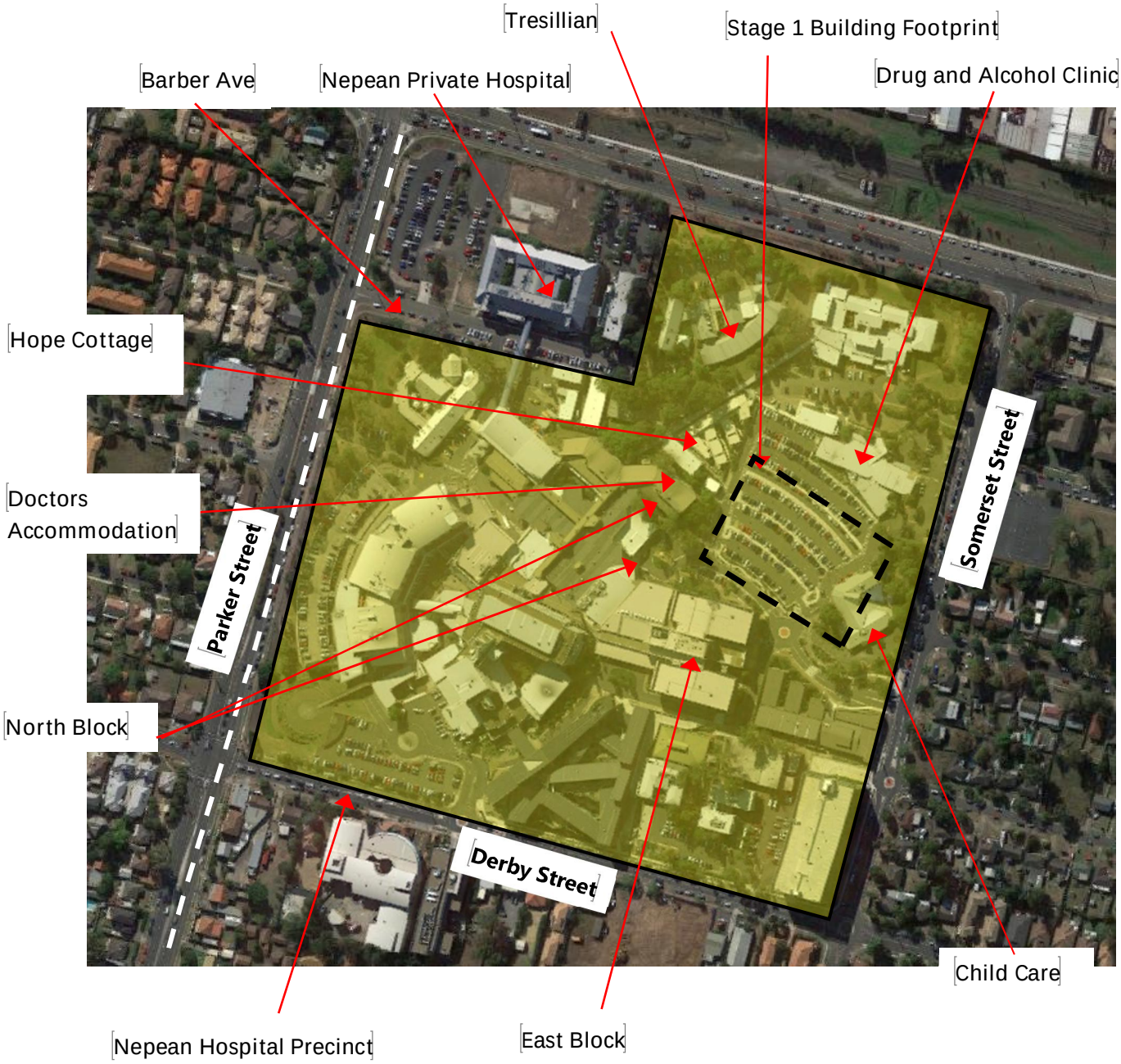
The proposed development consists of:

- A fourteen-storey development with roof top helipad, and major plant rooms located on level 4 and roof level.
- Ground level emergency department, with ambulance bay adjacent to the eastern façade.
- Mixture of in-patient units, specialty areas and shell spaces.

Noise sensitive development in the vicinity of the site is as follows:

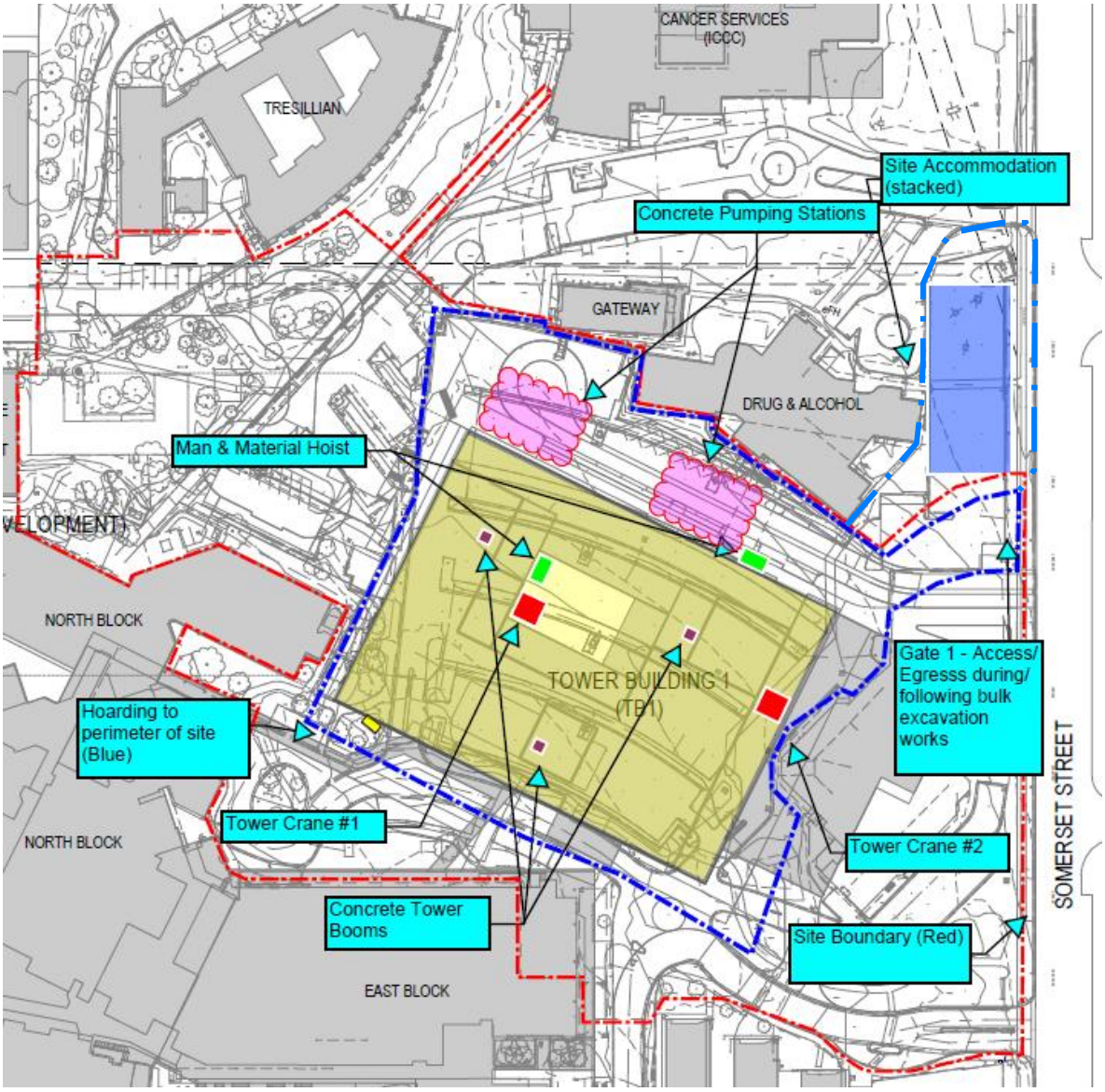
- Outside of Nepean Hospital Campus:
  - Residential development to the east (Somerset Street), west (Parker Street) and south (Derby Street).
  - Nepean Private Hospital which is located to the north-west, on the opposite side of Barber Ave.
- Within Nepean Hospital Campus:
  - A child care centre (to the east).
  - East Block (to the south). Three storey building with inpatient units and operating suites located on the northern façade facing the site.
  - North Block (2 storeys), Hope Cottage (1 storey) and the Doctors Accommodation (one Storey) to the west.
  - Drug and Alcohol, Gateway and Tresillian (to the north).

Refer to aerial photograph below showing site location and context.


Tresillian
Stage 1 Building Footprint
Barber Ave
Nepean Private Hospital
Drug and Alcohol Clinic
Hope Cottage
Doctors Accommodation
Parker Street
Somerset Street
North Block
Derby Street
Child Care
Nepean Hospital Precinct
East Block

Key considerations with respect to construction noise and vibration are as follows:

- Demolition works primarily will involve demolition of the existing on grade car park.
- Bulk excavation will be required. Given the geological conditions at the site, excavation is expected to be conducted using rock rippers (noise/vibration intensive equipment such as rock saws and hydraulic hammers is not expected to be required).
- Proposed piling method is to use bored piles. Use of a compactor will be required for a short period on the southern boundary prior to the commencement of piling works.
- Materials handling area (deliveries) and concrete pumping stations are proposed along the northern boundary of the site. Vehicular access is via a driveway on Somerset Street.
- Two tower cranes are proposed – one on the eastern façade of the new building, and one located centrally. Two hoists are proposed – one on the northern façade of the new building, and one located centrally.



3 CONSENT CONDITIONS

3.1 CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

B20. The Applicant must prepare a Construction Environmental Management Plan (CEMP) and it must include, but not be limited to, the following:

...

(c) Construction Noise and Vibration Management Sub-Plan (see condition B23)

B23. The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following:

(a) be prepared by a suitably qualified and experienced noise expert;

(b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009);

(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;

(d) include strategies that have been developed with the community for managing high noise generating works;

(e) describe the community consultation undertaken to develop the strategies in condition B23(d); and

(f) include a complaints management system that would be implemented for the duration of the construction.

3.2 CONSTRUCTION HOURS

C5. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

(a) between 7am and 6pm, Mondays to Fridays inclusive; and

(b) between 7am and 5pm, Saturdays.

No work may be carried out on Sundays or public holidays.

C6. Activities may be undertaken outside of the hours in condition C5 if required:

(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or

(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or

(c) where the works are inaudible at the nearest sensitive receivers; or

(d) where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works.

C7. Notification of such activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

(a) 9am to 12pm, Monday to Friday;

(b) 2pm to 5pm Monday to Friday; and

(c) 9am to 12pm, Saturday.

3.3 CONSTRUCTION TRAFFIC

C10. All construction vehicles (excluding worker vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site before stopping, unless directed by traffic control.

3.4 CONSTRUCTION NOISE LIMITS

C15. The development must be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures identified in the approved Construction Noise and Vibration Management Plan.

C16. The Applicant must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C5.

C17. The Applicant must implement, where practicable and without compromising the safety of construction staff or members of the public, the use audible movement alarms of a type that would minimise noise impacts on surrounding noise sensitive receivers.

C18. Any noise generated during construction of the development must not be offensive noise within the meaning of the Protection of the Environment Operations Act 1997 or exceed approved noise limits for the site.

C19. To provide a noise barrier during works, a Temporary 2.7m high solid noise screen around the permitter of the child care centre area is to be erected and managed during the demolition and construction.

3.5 VIBRATION CRITERIA

C20. Vibration caused by construction at any residence or structure outside the site must be limited to:

(a) for structural damage, the latest version of DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures (German Institute for Standardisation, 1999); and
(b) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: a technical guideline (DEC, 2006) (as may be updated or replaced from time to time).

C21. Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in condition C20

C22. The limits in conditions C20 and C21 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition B23 of this consent.

4 NOISE AND VIBRATION CRITERIA

Construction noise management levels will be formulated with reference to the following documents:

- NSW EPA Interim Construction Noise Guideline (ICNG);
- Australian Standard AS 2107:2016.

With respect to the application of the above criteria:

- Development in the vicinity of the site includes both development that is part of the Hospital Precinct (Hope Cottage, North/East Block, Doctors Accommodation etc) as well as development that is not a part of hospital (Somerset Street/Parker Road residences, Private Hospital).
- For development that is located within the Hospital precinct, it is open for the proponent (Health Infrastructure) to negotiate noise goals/management strategies directly, as it is an impact within their own site. However for assistance, target noise goals at all locations in the vicinity of the hospital have been determined.

4.1 CONSTRUCTION NOISE

4.1.1 Noise to External Areas - NSW EPA Interim Construction Noise Guideline

We note that Saturday works are proposed to be conducted between 7am and 5pm. The 7am-8am and 1pm-5pm periods are considered to be outside of typical construction hours. Noise emission goals for construction work with during typical hour construction hours, and outside of these times is provided below.

EPA guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- *"Noise Management"* trigger level. Where construction noise is predicted to exceed the "noise effected" level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the "noise effected level". For residential properties, the "noise effected" level occurs when construction noise exceeds ambient levels by more than:
  - 10dB(A)$L_{eq(15min)}$ for work during standard construction hours (7am-6pm Monday to Friday and 8am to 1pm on Saturdays) and
  - 5dB(A)$L_{eq(15min)}$for work outside of standard construction hours (7am-8am and 1pm-5pm on Saturday).
- "*Highly noise affected"* trigger level. Where noise emissions are such that nearby properties are "highly noise affected", noise controls such as respite periods should be considered. For residential properties, the "highly noise effected" level occurs when construction noise exceeds 75dB(A)$L_{eq(15min)}$ at nearby residences.

Long term unattended and attended background noise measurements were undertaken at Project Approval Stage (*Nepean Hospital and Integrated Ambulatory Services Redevelopment – SSDA, Acoustic Assessment*, document reference: 20170106.5/1208A/R7/MF, dated 23/07/2018). Results of background noise monitoring for the proposed periods of construction are detailed below.

Location	Period/Time	Background Noise Level dB(A) L_{90}
Residences – Parker Street	Monday – Saturday (Standard Construction Hours)	48
	Sunday (Outside of Standard Construction Hours)	48
Residences – Somerset Street	Monday – Saturday (Standard Construction Hours)	47
	Sunday (Outside of Standard Construction Hours)	47

A summary of noise emission goals for both standard hours of construction and outside of standard hours is presented below.

Table 1 – Interim Construction Noise Guideline – Noise Trigger Levels – External Areas

Location	Noise Management Level Trigger level - dB(A)$L_{eq(15min)}$*	"Highly Noise Affected" Trigger Level - dB(A)$L_{eq(15min)}$
Residences – Parker Street	58 (Standard Construction Hours) 53dB(A) (7am-8am and 1pm-5pm Saturday)	75
Residences – Somerset Street	57 (Standard Construction Hours) 52dB(A) (7am-8am and 1pm-5pm Saturday)	75
Commercial/ Private Hospital	70	N/A

Child Care Centre

With respect to the child care centre:

- Typically, a noise level of 55dB(A) is targeted as an external noise goal for outdoor play areas in child care centres.
- Given that construction noise impacts are temporary, it is reasonable to adopt a 60dB(A) noise target.

4.1.2 Noise to Internal Areas

Section 4.1.2 of the ICGN recommends the following construction noise management levels for hospital receivers:

Table 2 – Interim Construction Noise Guideline – Noise Trigger Levels – Internal Areas

Land Use	Management Level – dB(A)$L_{eq(15\ min)}$
Hospital Wards and Operating Theatres	Internal noise level – 45dB(A)

The ICGN does not have construction noise management levels for other noise sensitive areas within hospital receivers such as offices and consulting rooms.

Australian Standard AS2107:2016 is a commonly used standard for the assessment of noise impacted to internal areas.

Given that construction noise and a temporary, not a permanent noise source, it is reasonable that a more relaxed acoustic criteria is adopted as opposed to a straight application to the AS2107 recommended internal noise levels. In our experience, in the assessment of construction noise, it is common to adopt a noise target which is 5dB(A) more relaxed than the strict application of AS2107. This being the case, target internal noise levels for spaces other than wards and operating theatres is as follows:

Table 3 – Construction Noise Goals for Internal Areas Not Governed by AS2107

Land Use	AS2107 Noise Level	Proposed Construction Noise Goal – dB(A)$L_{eq(15min)}$
Private Office (Consulting Room, Treatment Room)	40dB(A)	45dB(A)
Open Plan Office	45dB(A)	50dB(A)
Hospital Accommodation	N/A	45dB(A)*

*Same noise goal as ward rooms is proposed.

4.2 CONSTRUCTION VIBRATION

4.2.1 Amenity Criteria

Vibration goals for the amenity of nearby land users are those recommended by the EPA document *Assessing Vibration: A technical guideline.* These levels are presented below:

Table 4 – Construction Vibration Goals - Amenity

Location	Time	Peak velocity (mm/s)	
		Preferred	Maximum
Continuous Vibration			
Residences	Daytime	0.28	0.56
Hospitals – Office Areas	When in use	0.56	1.1
Hospitals – Theatres	When in use	0.14	0.28
Impulsive Vibration			
Residences	Daytime	8.6	17
Hospitals – Office Areas	When in use	18	36
Hospitals – Theatres	When in use	0.14	0.28

4.2.2 Structure Borne Vibration Damage Criteria

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 1.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 5 - DIN 4150-3 (1999-02) Safe Limits for Building Vibration

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms^{-1})			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

5 ACTIVITIES TO BE CONDUCTED AND THE ASSOCIATED NOISE SOURCES

Typically, the most significant sources of noise or vibration generated during a construction project will be demolition, excavation, civil works (compaction, asphalting) and piling.

Table 6 - Sound Power Levels of the Proposed Equipment

EQUIPMENT /PROCESS	SOUND POWER LEVEL dB(A)*
Demolition and Excavation/Civil Works Phase	
Truck	105
Excavator with bucket	110
Rock Ripper	110
Compactor (Vibratory)	110
Piling (screw/augured)	105
Construction Phase	
Crane (Electric)	95
Bobcat (In Material Handling Area)	100
Concrete Vibrator	105
Hoist	100
Powered Hand Tools – external areas (formworking, façade etc)	95-100
Powered Hand Tools – Internal areas	95-100 (however noise emitted will be reduced as a result of building façade)

*The nominated Sound Power Levels take into account modifying factors as applicable under the NSW Noise Policy for Industry.

The noise levels presented in the above table are derived from the following sources, namely:

- Table A1 of Australian Standard 2436-2010.
- Data held by this office from other similar studies.

Noise levels take into account correction factors (for tonality, intermittency where necessary).

6 CONSTRUCTION NOISE ASSESSMENT

The predicted noise levels during demolition/construction will depend on:

- The activity undertaken.
- The distance between the work site and the receiver. For many of the work areas, the distance between the noise source and the receiver will vary depending on which end of the site the work is undertaken. For this reason, the predicted noise levels will be presented as a range.

Predicted noise levels are presented below. Predictions take into account the following:

- Noise reduction as a result of distance.
- When predicting noise impacts to internal areas of nearby development, a noise reduction o 25dB(A) through the (closed) façade of the noise impacted building is assumed (expected for 6mm glass or similar).
- Where applicable, noise screening provided by the solid plywood hoarding proposed to the eastern site perimeter (see section 7). This will provide screening to ground level works (excavation, piling, concrete pump, work zone noise).

6.1 DEVELOPMENT *OUTSIDE* OF NEPEAN HOSPITAL PRECINCT

Table 7 – Predicted Noise Generation – Somerset Street Residences*

Activity	Predicted Level – dB(A)$L_{eq(15min)}$	Noise Management Level dB(A)$L_{eq(15min)}$	Comment
Phase – Demolition/Excavation/Civil Phase			
Excavator – Dozer	45-50		Complies – Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	50-55		Complies – Standard Hours Trigger Levels. Minor Exceedance of Outside of Hours Trigger Level.
Compactor (Vibratory)	50-52		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	45-50	Noise Management Trigger Level 57dB(A) – Standard Construction Hours	Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	45	52dB(A) – 7am-8am and 1pm-5pm Saturday	Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	50		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	55-60	Highly Noise Affected Trigger Level 75dB(A)	Exceedance of Trigger Level when working on the Eastern façade above Hoarding Level.
Bobcat	45-50		Complies – Standard and Extended Hours Trigger Levels.
Hoist	50		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	50-55		Minor exceedance of Outside of Standard Hours Trigger Level when Working on Eastern Façade above hoarding level.
Hand tools – internal areas.	<40		Complies – Standard and Extended Hours Trigger Levels.

*Predictions take into account noise screen along eastern edge of the site as recommended in section 7.

Table 8 – Predicted Noise Generation – Nepean Private Hospital

Activity	Predicted Level – dB(A)$L_{eq(15min)}$ Internal Area	Noise Management Level dB(A)$L_{eq(15min)}$	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 45dB(A) – Internal Areas	
Excavator – Dozer	<30		Complies – Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	<35		Complies – Standard and Extended Hours Trigger Levels.
Compactor (Vibratory)	<30		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	<30		Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	<30		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	<30		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	<30		Complies – Standard and Extended Hours Trigger Levels.
Bobcat	<30		Complies – Standard and Extended Hours Trigger Levels.
Hoist	<30		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	<30		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<30		Complies – Standard and Extended Hours Trigger Levels.

6.2 DEVELOPMENT *WITHIN* NEPEAN HOSPITAL PRECINCT

Table 9 – Predicted Noise Generation – Hope Cottage/Doctors Accommodation/North Block

Activity	Predicted Level – dB(A)$L_{eq(15min)}$ Internal Area	Noise Management Level dB(A)$L_{eq(15min)}$	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 45dB(A) – Internal Areas	
Excavator – Dozer	30-50		Minor Exceedance when working near western boundary.
Bulk Excavation – Rock Ripper	35-55		Exceedance when working near western boundary.
Compactor (Vibratory)	40		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	30-50		Minor Exceedance when working near western boundary.
Phase – Construction Phase			
Crane (Electric)	<40		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	45-50		Minor Exceedance when using western pumping station.
Concrete Vibrator	30-50		Minor Exceedance when working near western boundary.
Bobcat	25-40		Complies – Standard and Extended Hours Trigger Levels.
Hoist	40		Complies – Standard and Extended Hours Trigger Levels..
Hand tools – external areas.	30-45		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<30		Complies – Standard and Extended Hours Trigger Levels.

Table 10 – Predicted Noise Generation - East Block

Activity	Predicted Level – dB(A)$L_{eq(15min)}$ Internal Area	Noise Management Level dB(A)$L_{eq(15min)}$	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 45dB(A) – Internal Areas	
Excavator – Dozer	30-50		Minor Exceedance when working near southern boundary.
Bulk Excavation – Rock Ripper	35-55		Exceedance when working near southern boundary.
Compactor (Vibratory)	40-55		Exceedance when working near southern boundary.
Piling (Augured)	30-50		Minor Exceedance when working near southern boundary.
Phase – Construction Phase			
Crane (Electric)	<35		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	<35		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	30-50		Minor Exceedance when working near southern boundary.
Bobcat	<35		Complies – Standard and Extended Hours Trigger Levels.
Hoist	<35		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	30-45		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<30		Complies – Standard and Extended Hours Trigger Levels.

Table 11 – Predicted Noise Generation – Drug and Alcohol

Activity	Predicted Level – dB(A)$L_{eq(15min)}$ Internal Area	Noise Management Level dB(A)$L_{eq(15min)}$	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 45dB(A) – Internal Areas	
Excavator – Dozer	30-45		Complies – Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	35-50		Minor Exceedance when working near northern boundary.
Compactor (Vibratory)	<40		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	30-45		Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	<40		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	<50		Exceedance of trigger level.
Concrete Vibrator	30-45		Complies – Standard and Extended Hours Trigger Levels..
Bobcat	30-45		Complies – Standard and Extended Hours Trigger Levels.
Hoist	<35		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	30-45		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<30		Complies – Standard and Extended Hours Trigger Levels.

Table 12 – Predicted Noise Generation – Tresillian

Activity	Predicted Level – dB(A)$L_{eq(15min)}$ Internal Area	Noise Management Level dB(A)$L_{eq(15min)}$	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 45dB(A) – Internal Areas	
Excavator – Dozer	30-35		Complies – Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	35-40		Complies – Standard and Extended Hours Trigger Levels.
Compactor (Vibratory)	<35		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	30-35		Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	<35		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	<40		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	<35		Complies – Standard and Extended Hours Trigger Levels.
Bobcat	<35		Complies – Standard and Extended Hours Trigger Levels.
Hoist	<35		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	<35		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<35		Complies – Standard and Extended Hours Trigger Levels.

Table 13 – Predicted Noise Generation – Child Care Centre

Activity	Predicted Level – dB(A)$L_{eq(15min)}$ External Area	Noise Management Level dB(A)$L_{eq(15min)}$	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 60dB(A) – External Areas	
Excavator – Dozer	40-60		Complies with Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	45-65		Exceeds Trigger Level when working on Eastern Boundary
Compactor (Vibratory)	<55		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	40-60		Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	55		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	50		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	50-75		Complies – Standard and Extended Hours Trigger Levels.
Bobcat	<45		Complies – Standard and Extended Hours Trigger Levels.
Hoist	60		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	50-70		Exceeds Trigger Level when working on Eastern Boundary when working above Hoarding Level
Hand tools – internal areas.	<55		Complies – Standard and Extended Hours Trigger Levels.

*Predictions take into account noise screen along eastern edge of the site as recommended in section 7.

6.3 DISCUSSION

6.3.1 Noise Impacts

6.3.1.1 Noise Impacts *Outside* of Nepean Hospital Precinct

- Nepean Private Hospital – Construction noise impacts are predicted to be compliant with Noise Management Levels.
- Somerset Street residences.

  Provided that the noise screen as detailed in section 7 is implemented:

  - During Standard Construction Hours - Noise impacts are expected to generally be compliant with Noise Management Levels.
  - During the Outside of Standard Hours Period (7am-8am and 1pm-5pm Saturday) - Noise impacts are expected to generally be compliant with Noise Management Levels with the exception of:
    - Noise from use of rock rippers on the eastern portion of the site.
    - Noise from powered hand tools and concrete vibrators when located above the hoarding level and on the eastern portion of the site.

6.3.1.2 Noise Impacts *Within* the Hospital Precinct

Exceedances of Noise Management Levels are predicted as follows:

- When working near the northern boundary, exceedances are predicted at the Drug and Alcohol Building. Noise from concrete pumps and vehicles in the Work Zone create the greatest impact. Noise from the use of rock rippers also causes a minor exceedance of the Noise Management Level.
- When working near the Eastern boundary, powered hand tools (form working), concrete vibrators and rock rippers result in exceedances of the 60dB(A) noise goal for the outdoor area of the Child Care Centre. Noise from powered hand tools and concrete vibrators once above the hoarding (noise screen) have the most significant exceedances.
- When working near the southern boundary (nearest to East Block), exceedances of noise management levels are predicted from use of rock rippers, compaction works and to a lesser degree general excavation and use of concrete vibrators in close proximity to the East Block façade.
- When working near the western boundary (nearest to North Block, Doctors Accommodation, Hope Cottage), exceedances of noise management levels are predicted from use of rock rippers, compaction works and to a lesser degree general excavation and use of concrete vibrators.

6.3.2 Vibration Impacts

We note that use of hydraulic hammers and vibrated piling (the most vibration intensive construction activities) is not proposed other than in localised areas (lift overrun).

This being the case, it will be compaction work (on the southern boundary) and rock ripping that create the greatest risk of vibration impact.

See section 7 for recommendations regarding vibration monitoring for the East and North Blocks.

7 RECOMMENDATIONS

7.1 NOISE IMPACTS OUTSIDE OF HOSPITAL PRECINCT

Given the potential impact on development outside the hospital precinct (Somerset Street residences) the following is recommended:

- As required by condition C19, a 2.7m high plywood hoarding is recommended along the eastern boundary of the site in order to protect the Somerset Street residences (and Child Care Centre).
- Major concrete pours (slabs/decks) on the eastern facade should not be conducted on Saturdays (before 7am or after 5pm) given the impact of the use of concrete vibrators/slab finishing equipment, particularly once located above the hoarding. Minor concrete pours on the east façade (ie core walls, columns etc) are acceptable on Saturdays. Away from the eastern façade, concrete pours are acceptable on Saturdays.
- If feasible, the eastern crane should either be electric, or should use a diesel power source which is located at ground level (and therefore screened by the hoarding).
- Notification should be provided to residences of the duration of the excavation/rock ripping period.
- Vehicles are not to typically arrive on site prior to 7am and should turn off their engines when idling. Trucks should wait on site, and not on Somerset Street. As required by condition C16, construction vehicles (including for concreting) are not to arrive on site outside of the approved hours detailed in condition C5.
- Trucks and bobcats to use a non-tonal reversing beacon (subject to OH&S requirements) to minimise potential disturbance of neighbours. Avoid careless dropping of construction materials into empty trucks.
- In the event of complaint, the procedures identified in sections 8 9 and 10 are to be followed.
- In the event that use of a rock hammer is required for isolated events (lift overrun or similar) it is recommend that this is not done before 8am or after 1pm on a Saturday.
- As required by condition C8, rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out during the following hours;
    - 9am – 12pm Monday to Friday;
    - 2pm – 5pm Monday to Friday; and
    - 9am – 12pm Saturday.

7.2 NOISE IMPACTS WITHIN HOSPITAL PRECINCT

With respect to noise impacts within the Nepean Hospital Precinct, given these buildings are a part of the hospital, it is open for hospital management to negotiate noise mitigation directly users. However the following is to be considered:

- *Drug and Alcohol Building* - Noise impact of concrete pumps and vehicles in the Northern Workzone on the Drug and Alcohol building will be moderate. A localised screen around the northern side of the pumping area is to be considered. Screen would be plywood, and as high as the pump. Alternatively, secondary glazing (Magnetite or similar) to any private offices/consult rooms on the southern façade of the Drug and Alcohol Building could be used.
- *Hope Cottage, Doctors Accommodation* – There will be a moderate noise impact from excavation, rock ripping and to a lesser degree from concrete pumps and vibrators. If feasible, hospital management should allocate room use during the daytime such that those rooms do not face the work site. If rooms facing the work site are anticipated to be used during daytime hours, Magnetite secondary glazing to these rooms is recommended.

- *North Block and East Block*:
  - There will be a moderate noise impact from excavation, rock ripping and to a lesser degree from concrete vibrators.
  - Use of secondary glazing to these buildings is not likely to be feasible:
  - Compaction works – this is anticipated to be short duration and it is recommended that Health Infrastructure advise hospital management of anticipated duration of works. If feasible, a roller (as opposed to vibratory) compactor is recommended.
  - Excavation using rock ripper – if feasible, work within 40m of the northern façade of the East Block and within 40m of the astern façade of the North block would not commence prior to 7.30am to reduce the noise impact on In Patient Units facing the construction site.
- As required by condition C8, rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out during the following hours;
  - 9am – 12pm Monday to Friday;
  - 2pm – 5pm Monday to Friday; and
  - 9am – 12pm Saturday.
- Noise monitoring at the commencement of ripping work is recommended to determine if any further protection (or scheduling of works) is required to the operating suites/day surgeries in the North and East Block
- Child Care Centre:
  - As required by condition C19, a 2.7m high plywood hoarding is recommended along the eastern boundary of the site in order to protect the Child Care Centre.
  - If feasible, the eastern crane should either be electric, or use a diesel power source which is located at ground level (and therefore screened by the hoarding).
  - If there are any windows of sleeping areas directly facing the construction site, secondary glazing (Magnetite or similar) is recommended.
- Vibration Monitoring.
  - During the excavation, compaction and piling process, unattended vibration monitoring is recommended at the following locations:
    - East Block – Monitor on Operating Suite level and In Patient Unit level.
    - North Block – Monitor on Day Surgery level and In Patient Unit level.
  - The proposed vibration monitoring equipment is a TEXCEL type monitor with externally mounted tri-axial geophone.
  - The monitors are proposed to be fitted with GSM modems and will remotely signal up to five mobile phones indicating any exceedance of the prescribed vibration criteria.
  - At least initially, SMS warning trigger to be set at 0.5mm/s for the Operating Suite/Day Surgery and 1mm/s for the Inpatient Units.
  - Weekly reports are provided detailing vibration monitoring results.

8 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

8.1 ESTABLISHMENT OF DIRECT COMMUNICATION WITH AFFECTED PARTIES

In order for any construction noise management programme to work effectively, continuous communication is required between all parties which may be potentially impacted upon, Hansen Yuncken and the regulatory authority. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

The objective in undertaking a consultation processes is to:

- Inform and educate the groups about the project and the noise controls being implemented;
- Increase understanding of all acoustic issues related to the project and options available;
- Identify group concerns generated by the project, so that they can be addressed; and
- Ensure that concerned individuals or groups are aware of and have access to the Complaints Register which will be used to address any construction noise related problems should they arise.

8.2 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise or vibration criteria occur immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration limits all work potentially producing vibration shall cease until the exceedance is investigated.

The effectiveness of any changes shall be verified before continuing. Documentation and training of site staff shall occur to ensure the practices that produced the exceedances are not repeated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- Summary of feedback to the complainant.

A permanent register of complaints should be held.

All complaints received should be fully investigated and reported to management. The complainant should also be notified of the results and actions arising from the investigation.

The investigation of a complaint shall involve where applicable;

- noise measurements at the affected receiver;
- an investigation of the activities occurring at the time of the incident;
- inspection of the activity to determine whether any undue noise is being emitted by equipment; and
- Whether work practices were being carried out either within established guidelines or outside these guidelines.

Where an item of plant is found to be emitting excessive noise, the cause is to be rectified as soon as possible. Where work practices within established guidelines are found to result in excessive noise being generated then the guidelines should be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees should be carried out.

Measurement or other methods shall validate the results of any corrective actions arising from a complaint where applicable.

8.3 CONSULTATION ALREADY CONDUCTED

CPB Contractors provides lookahead information for ongoing construction to inform Hospital management as well as surrounding sensitive receivers. Regular forums are held with key LHD stakeholders (including Disruption Notice Meetings & Risk Workshop Meetings) to discuss upcoming works – potential noise/vibration intensive works are discussed at these forums. Where it is identified that noise/vibration impacts may interfere with surrounding receivers, mitigation strategies are prepared with the affected parties to minimise disruption.

8.4 CONTINGENCY PLANS

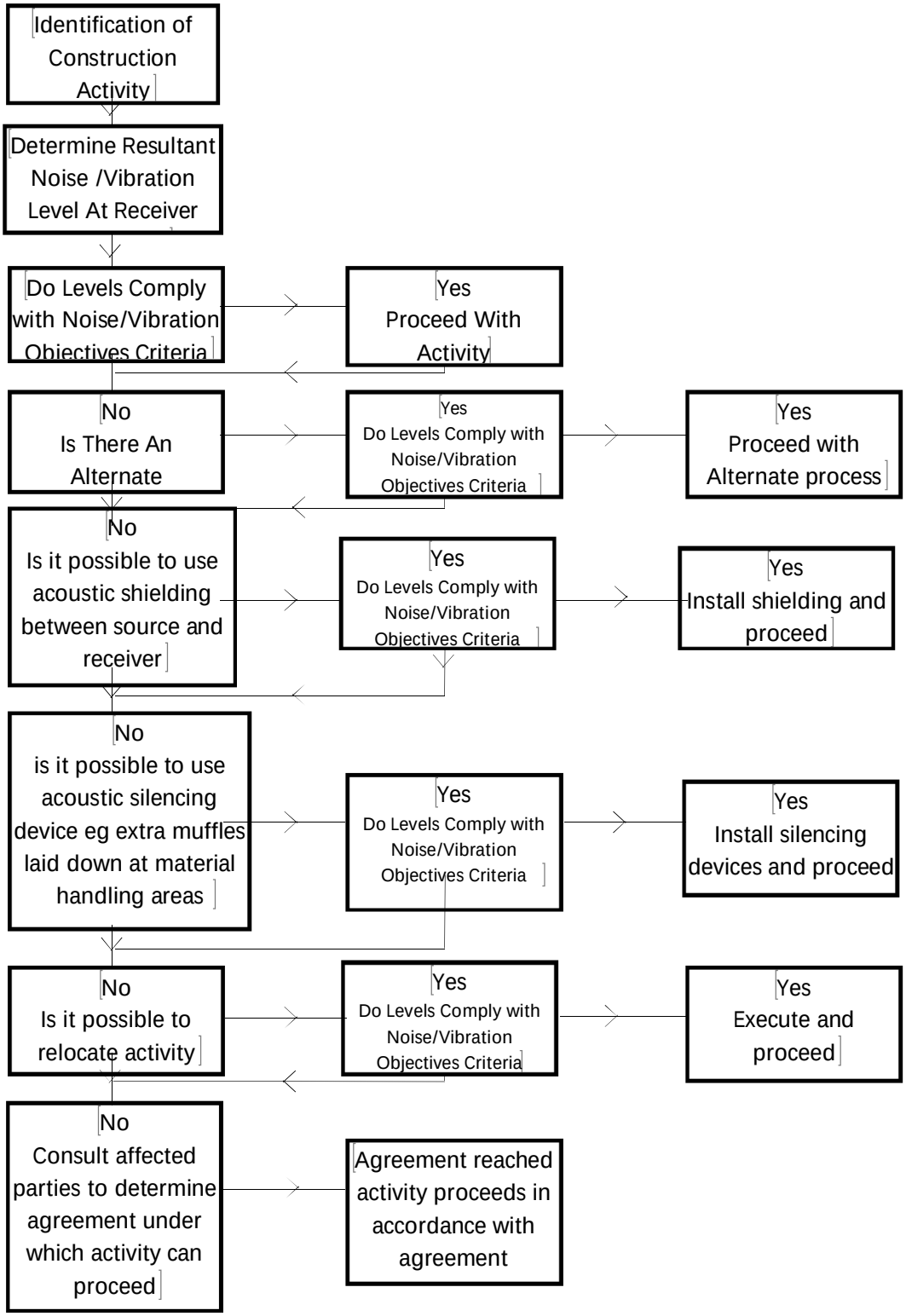
Where non-compliances or noise complaints are raised the following methodology will be implemented.

1. Determine the offending plant/equipment/process
2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.
3. Implement additional acoustic treatment in the form of localised barriers, silencers etc. where practical.
4. Selecting alternative equipment/processes where practical
5. If necessary, setup noise/vibration and dust monitoring devices at locations representing the nearest noise/vibration and dust affected receivers and provide data for each complain time period. Analysis is required to determine suitable mitigation measures.

Complaints associated with noise /vibration generated by site activities shall be recorded on a Complaint Form. The person(s) responsible for complaint handling and contact details for receiving of complaints shall be established on site prior to construction works commencing. A sign shall be displayed at the site indicating the Site Manager to the general public and their contact telephone number.

9 CONTROL OF CONSTRUCTION NOISE AND VIBRATION – PROCEDURAL STEPS

The flow chart presented below illustrates the process that will be followed in assessing construction activities.



10 ADDITIONAL NOISE AND VIBRATION CONTROL METHODS

In the event of complaints, there are a number of noise mitigation strategies available which can be considered.

The determination of appropriate noise control measures will be dependent on the particular activities and construction appliances. This section provides an outline of available methods.

10.1 SELECTION OF ALTERNATE APPLIANCE OR PROCESS

Where a particular activity or construction appliance is found to generate excessive noise levels, it may be possible to select an alternative approach or appliance. For example; the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. Undertaking this activity using bulldozers, ripping and/or milling machines will result in lower noise levels.

10.2 ACOUSTIC BARRIER

Given the position of adjacent development, it is unlikely that noise screens will provide significant acoustic benefit for commercial or residential receivers, but will provide noticeable improvement for those on ground level.

The placement of barriers at the source is generally only effective for static plant. Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.

Barriers can also be placed between the source and the receiver.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15dB(A) can be effected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance that is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10mm or 15mm thick plywood (radiata plywood) would be acceptable for the barriers.

10.3 TREATMENT OF SPECIFIC EQUIPMENT

In certain cases it may be possible to specially treat a piece of equipment to dramatically reduce the sound levels emitted.

10.4 ESTABLISHMENT OF SITE PRACTICES

This involves the formulation of work practices to reduce noise generation. A more detailed management plan will be developed for this project in accordance to the construction methodology outlining work procedures and methods for minimising noise.

10.5 COMBINATION OF METHODS

In some cases it may be necessary that two or more control measures be implemented to minimise noise.

11 CONCLUSION

A Construction Noise and Vibration Sub-Plan has been developed for the proposed construction works to be undertaken at the Nepean Hospital Stage 1 works.

Potential noise and vibration impacts on nearby buildings (both inside of and outside of the hospital precinct) have been assessed.

Provided that the mitigation techniques and the vibration monitoring as recommended in sections 7, 8, 9, and 10 of this report are adopted, noise and vibration impacts on the adjacent buildings will be minimised.

Please contact us if you have any queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Alex Washer

MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

Nepean Hospital Stage 1 - Construction

Out of Hours Construction Noise Assessment

SYDNEY
9 Sarah St
MASCOT NSW 2020
(02) 8339 8000

ABN 11 068 954 343
www.acousticlogic.com.au

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Project ID	20181654.10
Document Title	Out of Hours Construction Noise Assessment
Attention To	CPB Contractors Pty Limited

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	24/04/2020	20181654.10/2404A/R0/AR	AR		VF

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1 INTRODUCTION

This report presents Acoustic Logic Consultancy's review of the potential noise impacts associated with the proposed out of hours construction works at the Nepean Hospital Stage 1 Redevelopment.

This report will address the following:

- Identify potentially affected noise sensitive receivers surrounding the project site.
- Identify noise and vibration standards which will be applicable to this project.
- Identify likely sources of noise and vibration generation associated with the proposed out of hours works.
- Predict noise levels at nearby receivers.
- Formulation of a strategy to comply with the standards identified and mitigation treatments where necessary.

2 SITE DESCRIPTION AND PROPOSED WORKS

The proposed development consists of:

- A fourteen-storey development with roof top helipad, and major plant rooms located on Level 4 and Roof level.
- Ground level emergency department, with ambulance bay adjacent to eastern façade.
- Mixture of in-patient units, specialty areas and shell spaces.

As per the Acoustic Logic *Construction Noise and Vibration Management Plan* (ref: 20180899.2/1118/R2/TT, dated 16th November 2018), noise sensitive development in the vicinity of the site is as follows:

- Outside of Nepean Hospital Campus:
    - Residential development to the east (Somerset Street), west (Parker Street) and south (Derby Street). The Somerset Street residences are closest to the project site.
    - Nepean Private Hospital to the north west, on the opposite side of Barber Avenue.
- Within Nepean Hospital Campus:
    - A child care centre (to the east);
    - East Block (to the south) – Three storey building with inpatient units and operating suites located on the northern façade facing the site.
    - North Block (2 Storeys), Hope Cottage (1 storey) and the Doctors Accommodation (one storey) to the west.
    - Drug and Alcohol, Gateway and Tresillian (to the north).

An aerial photograph of the site, indicating the areas above is presented in Figure 1.

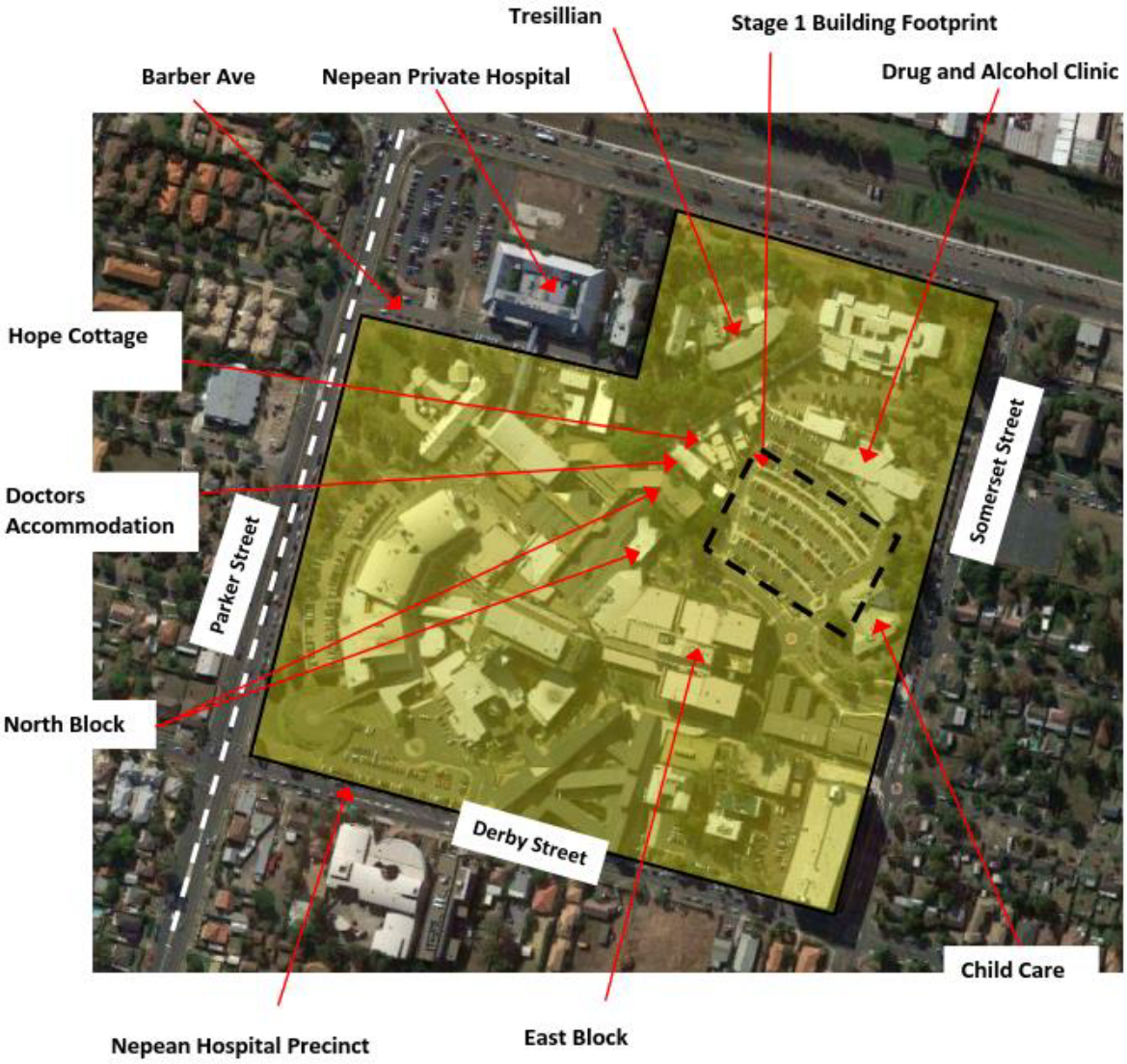


Figure 1 – Site Map

3 NOISE AND VIBRATION CRITERIA

Construction noise management levels associated with the out of hours works will be formulated with reference to the following documents/guidelines:

- SSD 8766 Development Consent Conditions.
- Australian Standard AS2107:2016.

With respect to the application of the above criteria:

- Development in the vicinity of the site includes both development that is part of the Hospital Precinct (Hope Cottage, North/East Block, Doctors Accommodation etc) as well as development that is not a part of hospital (Somerset/Parker Street residences, Private Hospital).
- For development that is located within the Hospital precinct, it is open for the proponent (Health Infrastructure) to negotiate noise goals/management strategies directly, as it is an impact within their own site.

3.1 CONSTRUCTION NOISE

3.1.1 Noise to External Areas

This assessment is specifically to address noise impacts associated with the proposed out of hours works. As per Condition C5, the approved construction hours are as follows:

- Mondays to Fridays: 7am-6pm
- Saturdays: 7am-5pm

Condition C6 of the development consent states the following:

C6. Activities may be undertaken outside of the hours in condition C5 if required:

(a) By the Police or a public authority for the delivery of vehicles, plant or materials; or
(b) In an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
(c) Where the works are inaudible at the nearest sensitive receivers; or
(d) Where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works.

In light of the information above, the following background noise levels in the table below have been obtained from noise monitoring conducted at the project site at Project Approval stage. The corresponding out of hours construction noise management levels (to make activities inaudible as per Condition C6), are presented in the following table.

Table 1 – Background Noise Levels and Construction Noise Management Levels as per Condition C6

Location	Time of Day	Background Noise Level $dB(A)L_{90(period)}$	Out of Hours Construction Noise Management Level $dB(A)\ L_{max}$
Somerset Street Residences	6:00am-7:00am	42	42
	7am-6pm (Sundays)	47	47
	6:00pm-8:00pm	45	45
	8:00pm-10:00pm	41	41
	10:00pm-12:00am	38	38
	12:00am-7:00am	37	37

3.1.2 Noise to Internal Areas and Child Care Centre

We note that the noise management level established for internal areas within the hospital precinct, the childcare centre and to the Nepean Private Hospital in the *Construction Noise and Vibration Management Plan* (ref: 20180899.2/1118/R2/TT, dated 16th November 2018) does not change depending of the time of day, and some of these spaces are not occupied during the extended hours. As such, noise impacts associated with the out of hours works will not be assessed with reference to these criteria, and recommendations of mitigation methods and management controls in the *Construction Noise and Vibration Management Plan* which apply to the approved hours of work will also apply to the out of hours works.

3.2 CONSTRUCTION VIBRATION

We note that the construction vibration criteria for amenity (from continuous and impulsive vibration) and building damage in the *Construction Noise and Vibration Management Plan* (ref: 20180899.2/1118/R2/TT, dated 16th November 2018) are also independent of the time of day. As such, recommendations to address the vibration impacts which apply to the approved hours of work will also apply to the out of hours works. **In any case, no perceptible vibration at the residential receivers is expected from the proposed activities.**

4 ACTIVITIES TO BE CONDUCTED AND THE ASSOCIATED NOISE SOURCES

The table below summarises the staging of the propose works, activities to be conducted, the louder plant items associated with that activity and the expected times of use.

Table 2 – Staging and Schedule of Proposed Works

Phase	Activity	Equipment	Time
Structure	Concrete Pour Finishing	Ride-on Helicopters	Mon-Fri: 6pm-12am Sat: 5pm-12am
	Steel Fixing	Electric Tower Crane	Sun: 7am-5pm
	Concrete Pump Setup	Concrete Pump (Only Setup)	Mon-Sat: 6am-7am
	Jumpform Dismantle	Electric Tower Crane Hand and Power Tools Electric Scissor Lift	Sun: 7am-5pm
	Tower Crane Jumping	Electric Tower Crane Hand and Power Tools	Sun: 7am-5pm
Fitout	Painting, patching, flooring, sanding, services install, commissioning	Electric Scissor Lift Hand and Power Tools	24/7
General Plant		Manitou	24/7
		Mobile Crane	Sun: 7am-5pm
		Diesel Boom Type Lift	Mon-Sat: 6pm-10pm
		Hoist	24/7

The sound power levels of the equipment above have been summarised in the table below.

Table 3 – Equipment/Plant Sound Power Levels

Equipment/Process	Sound Power Level dB(A)
Structure	
Ride on Helicopters	97
Electric Tower Crane	85
Powered Hand Tools	100
Electric Scissor Lift	95
Fitout	
Electric Scissor Lift	95
Powered Hand Tools	100
General Plant	
Mobile Crane	100
Diesel Boom Type Lift	100
Hoist (East, Central & West)	100

The noise levels presented int the above table are derived from the following sources:

- Table A1 of Australian Standard 2436-2010.
- Data held by this office from other similar studies.

5 PREDICTED NOISE LEVELS

The predicted noise levels during the proposed out of hours works will depend on:

- The activity undertaken.
- The distance between the equipment/plant location and the receiver. This will change depending on which end of the site the work is undertaken. For this reason, predicted noise levels are presented as a range where applicable (except for stationary plant).
- Noise screening provided by the hoarding to the eastern site perimeter, the surrounding hospital buildings and the building being constructed. Site hoardings will provide screening from ground level works, but will be less effective for works at a higher elevation.

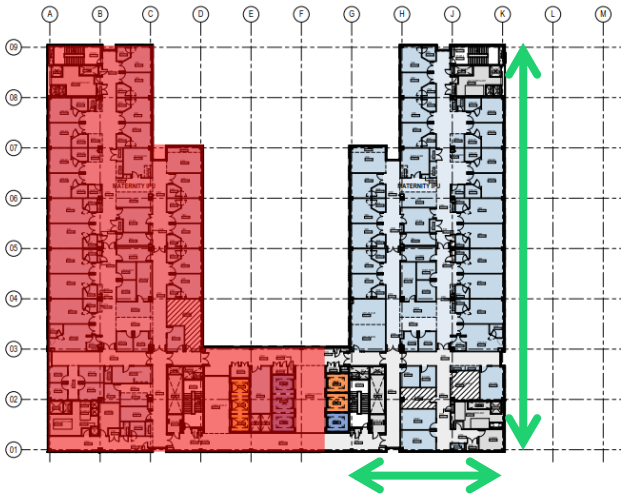
The predicted noise levels are discussed below.

5.1 DISCUSSION – NOISE IMPACTS

The following has been determined in respect of compliance with the inaudibility requirement of Condition C9 for the range of proposed activities.

5.1.1 Internal Works

In the blue zone, (see figure below) activities within the building can be undertaken at any time once the façade (as indicated by the green lines) has been closed in on that building level (except for minor holes such as for access, scaffolding propping (for example), etc).



Internal works in the red zone can be carried out at any time regardless of whether the façade is closed or not.

5.1.2 External Works

5.1.2.1 Electric Cranes and Hoists

Electric Cranes can be operated at any time including jumping and dismantling.

Hoist 1 and 2 are not shielded by the building form and are not expected to comply during the proposed out of hours works.

Hoist 3 (located centrally within the void at the centre of the building) will receive shielding from the building form and is expected to comply at all times.

5.1.2.2 External Scissor Lifts and Booms

These can be operated at any time provided they are located within the "U" or in the red zone. Outside these zones, operation close to the east façade can be undertaken up to 8pm.

5.1.2.3 Concrete Placement

Concrete pours would generally occur during normal working hours. However, these pours are sometimes delayed due to uncontrollable factors and particularly during winter concrete placement times can be extended. Hence additional flexibility is needed to enable this operation to be completed when needed. It is noted that if a pour cannot be successfully completed then considerable reworking and additional noise generation will result.

To minimise noise emissions, it is recommended that the concrete pumping station be located to the western end of the site at a location screened from Somerset Street, or in a basement or enclosed area.

Noise from powered trowels (helicopters) will be inaudible up to around 10pm. Operation after 10pm in the red zone would still be inaudible. Noise from this operation will become audible when operating closer to the eastern edge of the building. It is noted that operation of this equipment after 8pm would be infrequent, and operation after 10pm is not envisaged but may be needed as a final contingency. It is further noted that as more slabs are poured and the building gets higher, barrier screening will increase, and noise impacts will decrease in any case.

The use of hand finishing tools and the placement of reinforcing could also be done at any time provided it does not involve the use of angle grinders and steel cutting. These two operations could however be undertaken in the red zone up to 10pm.

The placement and removal of formwork using hammers could not be undertaken after 8pm.

6 CONCLUSION

This report presents Acoustic Logic Consultancy's review of the potential noise impacts associated with the proposed out of hours construction works at the Nepean Hospital Stage 1 Redevelopment.

Acoustic criteria has been established, which are consistent with the requirements of the conditions of consent for SSD 8766. In accordance with that condition, those operations that can be carried and generally result in inaudible emissions have been identified along with any additional restrictions in respect of time or site location applying to those activities.

It is noted that the assessment is based on typical noise emission levels. Additional activities, or reduced restrictions may be applicable where noise monitoring indicates plant noise levels are less than typical.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Artie Rattananikom

8. Construction Waste Management Subplan

Waste Management Plan

Integrated Nepean Hospital – Stage 1 Main Works

Project number:	N1038
Document number:	NHR-CPB-MPL-QLT-TB1-ALL-0000101
Revision date:	01/03/2021
Revision:	04

Document Approval

Rev.	Date	Prepared by	Reviewed by	Approved by	Remarks
A	18/12/17	C. Billinghurst	Raz Favotto		
Signature:					
B	06/04/18	C. Billinghurst	Raz Favotto		
Signature:					
C	21/07/18	C. Billinghurst	Steve Garzo		
Signature:					
00	14/11/18	Max Elmes	Nick Carnevale		
Signature:					
01	20/03/19	P Newcombe	Steve Garzo		
Signature:					
02	30/07/2019	Darren Green			
Signature:					
03	21/09/20	Kara McCormick	Patrick Newcombe	Steve Garzo	General review and update of sub plan
Signature:					
04	1/03/21	Dusan Cenic	Patrick Newcombe	Steve Garzo	General review and update of sub plan
Signature:		1/03 Dusan Cenic	1-3-2021	01/03/2021	

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Details of Revision Amendments

Document Control

The Project Manager is responsible for ensuring that this plan is reviewed and approved. The Project Environmental Manager is responsible for updating this plan to reflect changes to environmental, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Manager and/or client before being distributed / implemented.

Revision Details

Revision	Details
A	Issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment – Concept and Stage 1 SSDA
B	Issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment – SSDA
C	Issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment – SSDA. SEARs Table added with Cross References.
01	Updated to include response to submission comments and updated staging details.
02	Updated to identify the controls for removal and disposal of hazardous materials.
02	20/03/2020 - Reviewed, no changes.
03	Regular review and update sub plans of the CEMP as required under the SSDA conditions.
04	Regular review of sub plans of the CEMP as required under the SSDA conditions – No Changes

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1. Structure of this Plan

This Construction Waste Management Plan (CWMP) is a sub plan to the Construction Environmental Management Plan (CEMP) and outlines how we will achieve acceptable waste management and associated environmental outcomes on the Nepean Blue Mountains Local Health District Nepean Hospital, for the project and by the application of the CPB Contractors Environmental Management System (EMS).

In addition to the Project Management Plan, other Project Plans that interface with the Environmental Management Plan include:

- Construction Management Plan
- Engineering and Design Management Plan
- Quality Management Plan
- Safety and Health Management Plan
- Completion Management Plan

2. Project Overview

2.1 Purpose and Scope

CPB Contractors has been contracted by Health Infrastructure NSW to provide a Waste Management Plan for the Integrated Nepean Hospital –Stage 1 Main Works SSDA.

This Plan is established in accordance with 'The Way We Operate' framework and is the key sub plan to our Environmental Management Plan that integrates waste requirements stipulated in the planning approval and client contractual waste requirements during project delivery.

This Plan addresses the management and reporting of waste streams generated on the project.

Under the NSW *Protection of the Environment Operations Act, 1997* (POEO Act), waste is defined as:

- any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or
- any discarded, rejected, unwanted, surplus or abandoned substance, or
- any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or
- any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or
- any substance prescribed by the regulations to be waste.
- a substance is not precluded from being waste merely because it is or may be processed, recycled, re-used or recovered.

Activities conducted on the project that have the potential to generate waste are provided below in

Table 1.

Table 1: Activities, Hazards and Risks

Project Activity	Environmental Hazard	Environmental Risk
Construction and demolition processes	Generation of waste product On-site storage of waste	Soil and water contamination Visual impact, littering Odours Increase in pests Wind blown waste leaving site
Plant maintenance	Generation of waste oil	Soil and water contamination
Operation and maintenance of offices, crib huts and camp facilities	Generation of general wastes	Unnecessary load on landfill availability
Waste Transportation	Handling waste	Noise and dust impacts Mud tracking on roads Unlicensed facilities transporting or receiving waste

Implementation of the Waste Management Plan will:

- Identify the waste management obligations attached to the tender / project and the hazards and risks associated with the works
- Assist in the prevention of unauthorised environmental harm
- Fulfil the Client's waste management requirements as defined in the Contract, including complying with relevant permits and approvals
- Comply with all relevant waste management and environmental legislation
- Minimise negative impacts on the community that relate to the Project's waste management and associated environmental impacts
- Identify and implement feasible opportunities to reduce and recycle waste to minimize the impact of the Project to the environment.to meet compliance requirements
- Fulfil CPB Contractors' waste management and environmental requirements enabling continued certification to ISO14001 and contribution to CPB Contractors' overall Business Plans.

The Project Manager, with advice and input from senior construction staff, is responsible for the Plan.

2.2 Project Description

The scope for the Project is to complete a major re-development of Nepean Hospital Campus and provide an advanced integration with existing community health centres within the surrounding wider Penrith Local Government Area.

The Project's scope of work includes:

- A new clinical services block;
- A new and expanded Nepean Hospital Emergency Department;
- Expanded and upgraded medical imaging;
- Twelve (12) new operating theatres;
- Eighteen (18) birthing suites in new accommodation;
- A new Neonatal Intensive Care Unit;
- More than 200 overnight beds in new accommodation;
- A new helipad;
- A new facility for Community Health Services (St Mary's, excluding land acquisition); and
- Expansion of the existing medical oncology services.

2.3 Project Compliance Requirements

2.3.1 Waste Management Contract Requirements

The following table sets out the minimum client requirements as defined in Contract HI17167MW of the Preliminaries for the General Conditions (Main Works GC21 e2) as addressed within this Plan.

Table 2: Draft Contract Requirements for Environmental Management

Contract Reference	Content requirements	Where addressed
GC21 Preliminaries – 6.3	Implement waste minimisation and management measures, including: ▪ recycling and diverting from landfill surplus soil, rock, and other excavated or demolition materials, wherever practical; ▪ separately collecting and streaming quantities of waste concrete, bricks, blocks, timber, metals, plasterboard, paper and packaging, glass and plastics, and offering them for recycling where practical. Ensure that no waste from the Site is conveyed to or deposited at any place that cannot lawfully be used as a waste facility for that waste.	Waste Sub Plan
GC21 Preliminaries – 6.3	Monitor and record the volumes of waste and the methods and locations of disposal. Submit a progress report every two months, and a summary report before Completion, on the implementation of waste management measures, including the total quantity of material purchased, the quantity purchased with recycled content, the total quantity of waste generated, the total quantity recycled, the total quantity disposed of and the method and location of disposal in the form of a *Waste Recycling and Purchasing Report* available on the ProcurePoint website With the *Waste Recycling and Purchasing Report,* submit waste disposal certificates and/or company certification confirming appropriate, lawful disposal of waste.	Waste Sub Plan

2.3.2 Conditions of Approval

Conditions of approval that specifically address waste management are captured in Table 3. Note that control and monitoring requirements related to the removal and disposal of hazardous materials are addressed in detail in Section 9 of the Remedial Action Plan.

Table 3: Waste management Conditions of Approval

Contract Reference	Content requirements	Where addressed
SSD 8766 B24	The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the following:	
	a. detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations;	Appendix A
	b. removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility in accordance with the requirements of the relevant legislation, codes, standards and guidelines, prior to the commencement of any building works.	Section 9.0 of the Remediation Action Plan
SSD 8766 B32	The Applicant must notify the RMS Traffic Management Centre of the truck route(s) to be followed by trucks transporting waste material from the site, prior to the commencement of the removal of any waste material from the site.	Projects Construction Traffic Management Plan

Contract Reference	Content requirements	Where addressed
C34	Waste must be secured and maintained within designated waste storage areas at all times and must not leave the site onto neighbouring public or private properties.	Monitored on site
C35	All waste generated during construction must be assess, classified and managed in accordance with the Waste Classification Guidelines Part 1: Classifying Waste (EPA, 2014).	Monitored on site
C36	The body of any vehicle or trailer used to transport waste or excavation spoil must be covered before leaving the premises to prevent any spillage or escape of any dust, waste of spoil. Mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the site must be removed before leaving the premises.	Monitored on site
C37	The Applicant must ensure that concrete waste and rinse water are not disposed of on the site and are prevented from entering any natural or artificial watercourse.	Monitored on site
C38	The Applicant is to consult with SafeWork NSW concerning the handling of any asbestos waste that may be encountered during construction. The requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 – 'Transportation and management of asbestos waste' must also be complied with.	As required and addressed under the Remedial Action Plan

2.3.3 Waste Management Licenses

A search of the POEO public register for licensed facilities local to the project include identified the premises in Table 4.

Table 4: Licensed Waste Facilities

License number	Operator	Address	Fee Based Activity	License review due date
13426	Dial-A-Dump (EC) Pty Ltd – Eastern Creek Landfill (landfill)	Honeycomb Drive, Eastern Creek, NSW 2766	▪ Waste disposal by application to land ▪ Waste storage - other types of waste	15/02/2022
20121	Dial-A-Dump (EC) Pty Ltd (recycling)	Honeycomb Drive, Eastern Creek, NSW 2766	▪ Composting ▪ Recovery of general waste ▪ Waste storage - other types of waste	31/05/2022
4865	Enviroguard Pty Limited	50 Quarry Road, Erskine Park, NSW 2759	▪ Waste disposal by application to land	16/06/2024
20593	Hi Quality Quarry (NSW) Pty Ltd	Hi Quality Kemps Creek Central 1503-1519 Elizabeth Drive, Kemps Creek, NSW, 2178	▪ Recovery of general waste ▪ Waste storage - other types of waste ▪ Crushing, grinding or separating ▪ Land-based extractive activity	20/12/2021
3438	Penrith Waste Services Pty Limited	842 Mulgoa Road, Mulgoa, NSW, 2745	▪ Waste storage - other types of waste ▪ Waste disposal by application to land	14/01/2021
12901	**Recycling Parks Pty Ltd**	16-23 Clifton Avenue, Kemps Creek, NSW, 2178	▪ Waste disposal by application to land ▪ Waste storage - other types of waste	27/07/2023

License number	Operator	Address	Fee Based Activity	License review due date
			▪ Non-thermal treatment of general waste ▪ Land-based extractive activity	
20814	SRC Operations Pty Ltd	123 - 129 Patons Lane, Orchard Hills, NSW, 2748	▪ Waste disposal by application to land Land-based extractive activity	08/11/2021
4068	Suez Recycling and Recovery Pty Ltd	Elizabeth Drive Landfill Facility, 1725 ELlizabeth Drive, Kemps Creek, NSW, 2178	▪ Generation of electrical power from gas ▪ Waste storage - other types of waste ▪ Waste disposal by application to land	15/01/2021
12628	Cleanaway Co Pty Ltd	40 Christie St, St Marys, NSW, 2760	▪ Recovery of general waste ▪ Non-thermal treatment of hazardous and other waste ▪ Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	12/10/2021
12943	Cleanaway Co Pty Ltd	66 Links Road, St Marys, NSW, 2760	▪ Chemical storage waste generation ▪ Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	10/07/2023
20271	Cleanaway Co Pty Ltd	42-46 Charles St, St Marys, NSW, 2760	▪ Contaminated soil treatment ▪ Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste ▪ Non-thermal treatment of hazardous and other waste	26/09/2023
11753	CMA Ecocycle Pty Ltd	52-54 Power St, St Marys, NSW, 2760	▪ Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste ▪ Non-thermal treatment of hazardous and other waste	01/06/2020
5661	Solveco Pty Limited	38 Links Road, St Marys, NSW, 2760	▪ Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste ▪ Non-thermal treatment of hazardous and other waste	09/11/2020

2.4 Objectives and Targets

The project has set the following Waste Management performance targets. These include current business plan environmental targets for the Business Unit and the whole of CPB Contractors:

Table 5 Waste management performance objectives

Metric/Measure	Objective	Timeframe	Accountability
% of waste quantified in waste management reports	100%	At all times	Project Environmental Representative
% of regulated/hazardous wastes for which transfer certificates are retained	100%	At all times	Project Environmental Representative
Number of enforcement notices and penalties received from regulators and/or client	Zero	At all times	Project Environmental Representative
% waste recycled	90%	12 months	Project Manager

2.5 Key Environmental and Waste Management Stakeholders

Key waste management stakeholders for the Project will include:

- Principal's Authorised Representative Health Infrastructure
- CBRE
- CPB Contractors Pty Ltd
- Penrith City Council
- Office of Environment and Heritage (EPA)
- Building Compliance – Certifying Authority

3. Waste Streams

The waste streams and waste classifications in Table 6 have been identified for the Project works.

Table 6 Waste Streams

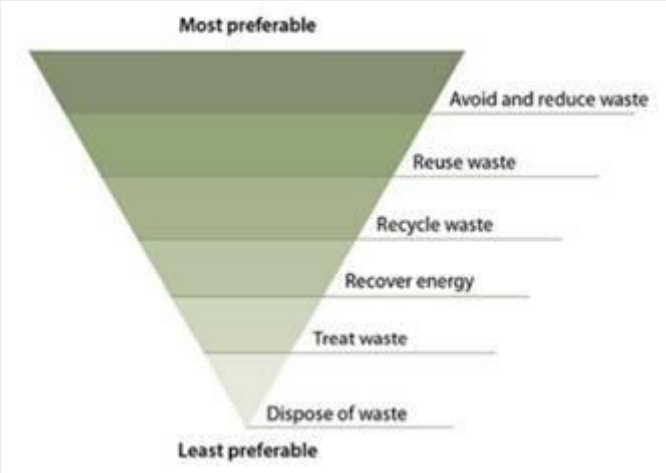
Waste	Classification	Potential Recovery/Reuse	Disposal (all tracked)
Green waste from vegetation clearing, pruning and timber off cuts	General Solid Waste (Non-putrescible)	▪ Green waste would be reused as mulch onsite or provided to local schools for landscaping.	▪ Green waste from vegetation clearance works or pruning to be removed by subcontractor. ▪ Timber off cuts to be segregated and removed by licensed contractor to licensed waste facility.
Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM)	General Solid Waste (Non-putrescible) – Resource Recovery Exemption	▪ Where possible, all suitable fill materials would be used on site	▪ Wherever possible, ENM or VENM would be used on the project where possible and excess material would be transferred to appropriately approved sites requiring ENM.
Mixed Spoil	General Solid Waste (Non-putrescible)	▪ Where possible, all suitable fill materials would be used on site.	▪ Mixed unsuitable spoil would be transferred to appropriately approved waste facilities.
Demolition concrete	General Solid Waste (Non-putrescible)	▪ Stockpiled and transported to recycling centre and recycled for project construction activities.	▪ Nil. Valuable resource.
Building rubble and structural element demolition materials	General Solid Waste (Non-putrescible)	▪ Collected in designated collection areas and reused as much as practically possible.	▪ Mixed unsuitable materials would be transferred to appropriately approved waste facilities.
Waste metals	General Solid Waste (Non-putrescible)	▪ Stockpiled and transported to recycling centre.	▪ Nil. Valuable resource.
General office waste – paper, cardboard, used printer cartridges.	General Solid Waste (Non-putrescible)	▪ Office waste such as paper, cardboard boxes, comingled wastes (Cans, plastic bottles etc) and used printer cartridges would be recycled.	▪ Food wastes and non-recyclables will be sent to landfill.
Asbestos or Asbestos Containing Material	Special Waste	▪ Fragments of non-friable ACM identified from site investigations. Refer to JBS&G RAP.	▪ Asbestos will be remediated in accordance with the JBS&G RAP.
PCB containing capacitors	Special Waste	▪ None currently identified	▪ Prior to demolition when the power is disconnected, inspect the light fittings. ▪ Metal PCB containing capacitors are to be removed, placed in plastic lined 200 litre drums and disposed of as PCB Scheduled Waste.

4. Controls Used to Manage Waste

Controls that are adequate to ensure compliance and to reduce risk to the lowest acceptable rating achievable are planned before any relevant works commence. Elimination of the waste is the first preference of control, followed by reuse and recycling. Controls used on this project include:

Table 7: Waste management controls

Control	Accountability
All wastes need to be classified, stored, tracked, transported and treated in accordance with contractual and regulatory requirements, including the Waste Classification Guidelines Part 1: Classifying Waste (EPA, 2014) and the use of licensed transporters and treatment facilities.	Supervisor Environmental Manager
The relevant licences of waste facilities utilised for the disposal or handling of waste will be obtained to ensure they are legally compliant.	Environmental Manager
Storage containers (bins, skips, tanks, etc) are provided at each work area in sufficient numbers to facilitate segregation of waste at the source of generation, wherever possible. The correct bin type must be used to avoid contamination.	All
Containers are clearly sign posted to inform all project personnel of the correct material to be placed within each bin type. Containers are emptied at a frequency that is sufficient to ensure their correct use. If a bin needs to be collected contact your Supervisor or Project Environmental Representative	Supervisor
Burial or burning of waste is not permitted.	All
Excess concrete and concrete washout is not to be discharged to land or storm water; a concrete washout facility must always be used.	Supervisor
All waste data must be collated and tracked using Material Tracking Forms.	Engineer / Environmental Manager
An adequate number of fully maintained concrete washout pits will be maintained on the site at all times.	Supervisor
A Demolition Waste Management Plan shall be prepared by an appropriately qualified contractor prior to the commencement of works. The Waste Management Plan should be prepared in accordance with DECCW's "Waste Classification Guidelines (2008)" and the Protection of the Environment Operations Act 1997. ***Note this plan forms the Demolition Waste Management Plan***	Environmental Manager
The Demolition Waste Management Plan is to include the following requirements and details: c. The type and volume of all waste materials (e.g. bricks, concrete, timbers, plasterboard and metals) is to be estimated prior to the commencement of works, with the destination for each waste identified. Waste should be re-used or recycled as much as practicable. Where not practicable, the location of a suitable waste disposal facility is to be identified. d. Non-recyclable waste and containers are to be regularly collected and disposed of at a licensed disposal site. Frequency of collection should be identified. e. No burning or burying of waste is permitted on the site. f. Any bulk garbage bins delivered by authorised waste contractors are to be placed and kept within the property boundary.	Environmental Manager
The worksite should be left tidy and rubbish free each day prior to leaving the site and at the completion of works.	Supervisor
No hazardous materials or dangerous goods are to be used or stored on site.	Supervisor

Control	Accountability
All materials on-site or being delivered to the site must be wholly contained within the site. The requirements of the Protection of the Environment Operations Act 1997 are to be complied with when placing/stockpiling loose material or when disposing of waste products or during any other activities likely to pollute drains or watercourses.	Supervisor
The public way must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.	Supervisor
All equipment and machinery should be secured against vandalism outside of working hours.	Supervisor
A copy of the approved and certified plans, specifications and documentation shall be kept on site at all times and shall be available for perusal by any officer of Council.	All
No vehicle maintenance is permitted in the demolition areas except in emergencies.	Supervisor
Any loose material stockpiles are to be stored within the temporary construction compound(s) and are to be protected from possible erosion.	Supervisor/Environmental Manager
Where available, recyclable site and construction waste are to be recycled in accordance with the NSW Government's Waste Reduction and Purchasing Policy (WRAPP guidelines). Any waste oil is to be sent to an approved recycler.	Supervisor
Non-recyclable waste and containers are to be regularly collected and disposed of at a licensed landfill or other disposal site in the area.	Supervisor
Any bulk garbage bins delivered by Authorised Waste Contractors are to be placed and kept within the property boundary.	Project Engineer
Waste management practices for the project are to follow the resource management hierarchy principles embodied in the Waste Avoidance and Resource Recovery Act 2001.  Figure 1 - Waste Management Hierarchy	Environmental Manager
Disturbed areas and haul roads must be treated with dust suppressants (e.g. water trucks or chemical suppressants) especially in high risk areas and/or on during high risk days.	Supervisor
Stabilised access, rumble grids, wash bays or similar must be established for the entries site and exits to site to minimise mud on public roads. Sweepers shall be used periodically to clean public roads where mud has been deposited.	Supervisor
Traffic speed limit(s) are determined to minimise dust generation and must be adhered to at all times.	All

Control	Accountability
All construction plant and equipment must be maintained so they do not emit visible smoke for any period greater than: ▪ 15 consecutive seconds for plant not being registered for use on public roads; and ▪ 10 consecutive seconds for plant registered for use on public roads.	Supervisor
Competently designed and constructed rumble pads shall be established for the ingress and egress of all vehicles.	Project Engineer
Air quality monitoring conducted in accordance with <insert relevant code, standard, guideline, etc. and at a frequency and at locations to confirm compliance with the regulatory limits will be conducted.	Environmental manager
Dust generated during demolition activities is to be controlled by regular control measures such as on-site watering	Supervisor
All necessary maintenance for construction vehicles and equipment is to be undertaken during the demolition period.	Project Engineer
Excessive use of vehicles and powered demolition equipment is to be avoided.	Supervisor
Exposed areas are to be progressively revegetated as soon as practical.	Supervisor
Vehicle wash down areas are to be established to ensure all mud and soil from construction vehicles is not carried onto public roads.	Project Engineer
All vehicles involved in any demolition and departing the site with demolition materials, spoil or loose matter must have their loads fully covered before entering the public roadway.	Supervisor Demolition sub-contractor
Any mud deposited on the road network due to truck movements to and from the site is to be cleaned up immediately.	Supervisor

5. Monitoring

Waste data is collected on the project to allow monthly reporting of the following:

- The quantity of each type of waste sent to landfill
- The quantity of each type of waste recycled
- The quantity of each type of waste reused
- The quantity of each type of hazardous/regulated waste generated on the project and:
  - Its method of treatment and disposal
  - The location of treatment and disposal
  - Copies of records confirming the legal transport, treatment and disposal
- Measurement of any reduction in waste generation that has been achieved

The quantity of waste in each solid waste stream is measured by weight and liquid waste stream by volume, with records provided by the waste transport contractor. Alternative measures may only be used when an economical alternative is not available.

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Appendix A: Estimate of waste quantities for reuse, recycling and disposal locations

Table 8 Estimated quantities of waste types generated during early works phase

Description of Material	Waste Classification	Estimated Volume (m^3)	Onsite reuse	Offsite recycling	Offsite disposal
Asphalt/Bitumen	Pre-classified: Asphalt waste **General Solid Waste (non-putrescible)**	1300 m^3	Nil	All. Concrete recyclers	N/A
Concrete (Kerbs, gutters and concrete footpaths and footings)	Pre-classified: Building and demolition waste **General Solid Waste (non-putrescible)**	250 m^3	Nil	All. Concrete recyclers	N/A
Excavation Material from Bulk Excavation	This material needs to be classified before it can be managed.	24,315 m3	Nil	Penrith Waste Services Pty Limited	Penrith Waste Services Pty Limited
Metal (Demolition Light Poles, Bollards Crash Barriers & other miscellaneous steel/ metal work and off cuts)	Pre-classified: Building and demolition waste **General Solid Waste (non-putrescible)**	64 m^3	Nil	All. Bingo –Recycling Dial a Dump	N/A
Block work, retaining walls, crib walls as required.	Pre-classified: Building and demolition waste **General Solid Waste (non-putrescible)**	150 m^3	Nil	All. Bingo –Recycling Dial a Dump	N/A
PVC Pipe	Pre-classified: Building and demolition waste **General Solid Waste (non-putrescible)**	32 m3	Nil	All. Bingo –Recycling Dial a Dump	N/A
Terracotta/ Concrete Pipe	Pre-classified: Building and demolition waste **General Solid Waste (non-putrescible)**	30 m3	Nil	All. Bingo –Recycling Dial a Dump	N/A

Description of Material	Waste Classification	Estimated Volume (m^3)	Onsite reuse	Offsite recycling	Offsite disposal
Garden Organics	Pre-classified: Garden waste **General Solid Waste (non-putrescible)**	64 m^3	Nil	All. Bingo –Recycling Dial a Dump	N/A
Packaging – used pallets	Pre-classified: Building and demolition waste **General Solid Waste (non-putrescible)**	20 m^3	Nil	All. Bingo –Recycling Dial a Dump	N/A
Plasterboard	Pre-classified: Plasterboard **General Solid Waste (non-putrescible)**	7 m^3	Nil	Nil	Kurnell or other Landfill site T.B.A.

9. Construction Soil and Water Management Subplan

BONACCI

Nepean Hospital Redevelopment - Construction Soil and Water Management Plan

Bonacci Group (NSW) Pty Ltd Consulting Engineers
Level 6, 37 York Street, Sydney NSW 2000 Australia ABN 29 102 716 352 T: +61 2 8247 8400
reception.syd@bonaccigroup.com bonaccigroup.com

Document Status Note:

Revision	Date Issued	Prepared by	Updated by	Approved by	Title
A	29/03/2019	VC		SN	Associate Director
B	05/04/2019	VC		SN	Associate Director
C	01/08/2019	VC		SN	Associate Director
D	04/03/2020		JB	SN	Associate Director
E	17/09/2020			GD	Principal Engineer
F	24/02/2021			GK	Senior Civil Engineer

Prepared by: Vincent Chu – Principal Civil Engineer

Updated by: George Krzywda – Senior Civil Engineer

Date:24 February 2021

Project Name: Nepean Hospital

BG Project No: 20 21820

Discipline: Civil Engineering

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Report Amendment Register

Rev. No.	Section & Page No.	Issue/Amendment	Updated/Initials	Reviewer/Initials	Date
E	Appendix A	Updated App A Drawings to reflect current site conditions		GD	17/09/2020
F		No Changes		GK	24/02/2021

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1. Introduction

This Construction Soil and Water Management Plan (CSWMSP) has been developed as part of the Construction Environmental Management Plan (CEMP) to address the construction activities associated with Nepean Hospital Redevelopment stage 1. This CSWMSP has been prepared to fulfil the Conditions of Consent issued by the Minister for Planning for the Project, specifically Condition B25.

2. Existing Environment

2.1 Topography and soil characteristics

2.1.1 Existing Soil Landscape

The 1:100,000 Geological Series Sheet 9030 'Penrith' indicates that the site is underlain by Bringelly Shale of the Wianamatta Group consisting of shale, carbonaceous claystone, claystone, laminate, fine to medium grained lithic sandstone, rare coal and tuff. It consists of relatively shallow fill overlying residual silty which is transitioned to weather shale or weathered sandstone bedrock at depths ranging from 1.3m to 5.5m.

2.1.2 Salinity

With reference to the Department of Natural Resource's 1:100,000 Map of Salinity Potential in Western Sydney, the site is located in an area where there is a moderate potential for soil and groundwater salinity to occur.

2.1.3 Acid Sulphate Soils

The site is not located in an acid sulphate soil (ASS) risk area in accordance with the risk maps prepared by the Department of Land and Water Conservation.

2.1.4 Ground Water

The Geotechnical site assessment prepared by JK Geotechnics (Ref 29845L3) dated 7th September 2018 states that the subsurface conditions at the site are likely to consist of residual soils overlying relatively shallow bedrock. The potential for viable groundwater abstraction and uses of groundwater under these conditions is considered to be low. Groundwater is unlikely to be encountered during the proposed development works where only relatively minor/shallow excavations are required, however groundwater may be encountered in the event deeper excavations are required. Based on the local topography, shallow groundwater at the site would be expected to flow towards the north/north-east.

2.1.5 Surface Water

Surface watercourses were not identified in the immediate vicinity of the site. The closest surface watercourse is Werrington Lakes (approximately 2km to the east/north-east of the site). The Nepean River is located approximately 3.5km to the west of the site.

2.1.6 Flooding

The site boundaries have been compared to flood modelling results prepared by Catchment Simulation Solutions dated 5th June 2017 (College, Orth and Werrington Creeks Catchment Overland Flow Flood Study Final Report). The findings of which indicate that the majority of the sites is not at risk of flooding under the 100-year ARI design storm event and PMF except the northern side of the subject site at Drug and Alcohol Buildings with the estimated PMF level of approximately 49 m.

3. Construction Soil and Water Management

Erosion and Sediment Control measures will be prepared prior to disturbance, or as site conditions dictate, during a change in site layout, and documented in progressive CSWMSP. These may be specific to a site, a sub-site, sub-catchment or individual component of the work.

3.1 General Strategies

Environmental protection during construction will involve the installation, use and maintenance of temporary erosion and sediment control measures as required in accordance with the following principles:

- Before undertaking any construction work (including earthmoving or vegetation removal works), implement all soil and water management works required to minimize pollution of waters.
- All erosion and sediment controls should be installed in accordance with best-practice guidelines such NSW Blue Book Volumes 1 and 2D (Landcom, 2004 and DECC, 2008).
- Maintaining ground cover for as long possible to minimize erosion and sedimentation.
- Diversion of 'clean' run-off from offsite around or through the worksite without it contacting exposed soils or mixing with 'dirty' onsite water and maintaining existing drainage infrastructure wherever possible.
- Minimization of soil erosion and mobilization of sediment during rain events.
- Use of suitable sediment retention structures and control measures to filter or retain mobilized sediment generated during rain events over surface disturbances.
- Maximum sediment captures through effective positioning of temporary erosion and sediment control structures.
- Progressive rehabilitation and/or stabilization of completed areas to minimize erosion hazard, as soon as practicable
- Regular inspection and maintenance of all erosion and sediment controls to ensure they are effective.
- Targeted training on ERSED principles for key staff.
- CPB to ensure that any road, footpath, shared path or cycleway which is open to the public is at all times kept free of mud, dirt, dust, deleterious material, debris, obstructions and trip hazards arising from LOR activities in accordance with the project approval.
- CPB to install, maintain and utilize appropriate site exit controls. This may include wheel wash facilities. These measures would be put in place to mitigate the risk of any loss of fuels, lubricants, load or other substances.
- Any spillage or build-up of such material or debris would be cleaned up as soon as practicable.

3.2 Key Erosion and Sediment Control Measures

The following measures are to be implemented where soil disturbance occurs to control water flows and filter or capture sediment. A combination of these measures would be required in areas that cannot be directed to sediment basins if required and/or produce a potential soil loss of less than 150m^3 per year. These would be installed in accordance with design principals mentioned in the NSW Blue Book Volumes 1 and 2D (Landcom, 2004 and DECC, 2008). Soil and Water Management Plan and details are attached in Appendix A.

3.2.1 Site Entry and Access Requirements

- Stabilized access points to prevent mud tracking on roads will be established.
- Access points to be clearly delineated.
- Use of street sweepers where required.
- Longer term and/or heavily used haul roads will generally be sealed. Sealed haul roads will be regularly cleaned.
- Unsealed haul roads to be regularly damped down with fixed or mobile sprinkler systems.
- Appropriate site speed limits will be imposed and signed on haul routes.
- Exclusion zones to be designated on construction sites to limit disturbance.

3.2.2 Soil Stripping and Stockpiling

- Stockpile areas are to be established within approved low-hazard areas clear of watercourses, stormwater drainage lines/culverts and not within the dripline of any retained trees where feasible and reasonable.
- Diversion drains/bunds are to be installed on the high side of stockpiles if runoff from upslope lands could impact on the stockpile.
- As much as is feasible, mulched vegetation, topsoil and subsoil (if applicable) are to be stockpiled separately.
- Any contaminated material stockpiles (i.e. asbestos, contaminated soil) should be covered on-site and short-term material stockpiles with potential to generate dust should be wetted down or covered to prevent fugitive dust emissions or run-off during wet weather. Long-term stockpiles (>30 days) are to be stabilized and /or covered in accordance with "Blue Book" requirements.
- Topsoil and mulch stockpiles are to be constructed to no more than 2m in height where possible.
- Stockpiles should be battered down to a maximum slope of 2:1 (H:V) where space permits.
- Material transport from site to surrounding pavement surfaces is to be minimized.

3.2.3 Dust Control

- Dust suppression is to be carried out whenever necessary to minimize sediments becoming air borne due to wind erosion.
- Wherever possible, water detained onsite is to be re-used for dust control.

3.2.4 Stabilization

- Undertake progressive stabilization of ground surfaces as quickly as possible as they are completed rather than at the end of the works program.
- Progressively revegetate disturbed areas utilizing appropriate species in those areas to be revegetated.
- Temporary ground covers such as hydraulic soil stabilizers or geotextile fabric are to be used as much as possible to stabilize batters, stockpiles and large surface areas.
- Scour protection and energy dissipation should be used around discharge points at local points to reduce erosion where necessary.

3.2.5 Sediment Controls

- Sediment controls will be installed around stormwater inlet pits where appropriate and where they will not cause or exacerbate flooding. Traffic management and safety will need to be considered if installing such devices on or near live traffic.

- Turbid construction runoff should be diverted into sediment retention devices such as sediment sumps, sediment fences and other sediment traps where feasible to prevent surface run-off from leaving the site.
- Sediment removed from any trapping device is to be relocated where further pollution to downslope lands and waterways cannot occur.
- Mulch bunds should not be used in concentrated flow areas or if they have the potential to result in tannin leachate into waterways.
- All erosion and sediment controls are to be inspected at least weekly, before a site closure of two days or more, and after rainfall exceeding 20 mm in 24 hours. Maintenance will be carried out as required prior to the next forecast rainfall event.
- Clean water diversions to be constructed and stabilized around work areas
- Stockpiles should not be placed within 2m of hazards areas including likely areas of high velocity flows such as paved areas and driveways.
- Temporary sediment traps are to be retained until after revegetation/rehabilitation.

3.2.6 Sediment Basins

As the soil loss estimated is less than 150m^3 per year using the RUSLE in accordance with "Blue Book" calculations, a sediment basin is **not required** for the development. However, the early work excavation for new Nepean Hospital Building can be utilized as a temporary sediment basin until the construction of the proposed building commences.
The purpose of using a temporary sediment basin is to provide additional environmental protection. This temporary sediment basin is to capture and provide settlement time for colloidal suspended particles with treatment.

3.3 Surface Water Management

The following measures are to be implemented to manage stormwater (i.e. clean and dirty water) and flood flows for small and large sized events.

3.3.1 Stormwater Management

Management of clean and dirty water catchments and the runoff entering and generated onsite is essential to effectively manage soil and water onsite.
Prior to construction works commencing, construction of upstream diversion drains or bunds is required to separate runoff entering from clean offsite upstream catchments and runoff generated from dirty catchments. In this case, sediment traps will be adopted for the existing stormwater pits. These stormwater pits will be maintained clean at any areas where construction runoff can enter.

3.3.2 Water Reuse

Where practicable, any water collected in excavations / work sites will be reused within the premises (e.g. dust suppression, watering retained vegetation). Approval must first be obtained from the Project's Environmental Representative (PER) prior to any discharge off the premises, or reuse within the premises, to ensure that water is suitable for reuse or discharge.
For reuse of water onsite, the following criteria must be met:

- pH – 6.5 to 8.5
- No visible oil and grease
- No potential for water to leave the premises
- No surface runoff will be generated from the reuse (reuse includes dust suppression, watering retained vegetation etc.)
- No potential for water to reach any watercourse

3.2.3 Off-site Discharge Management

The proposed site is located generally over an existing on grade carpark and roadway. The stormwater for North Block, East Block and the surrounding carparks and roadways is conveyed through a piped network to a discharge point on the eastern boundary opposite Rogers Road.

An overland flow path exists from Barber Avenue to Somerset Street, passing to the North of Gateway clinic and the Drug and Alcohol Unit. This overland flow path is not impacted by the proposed construction activities However, it is required to be maintained during construction.

The discharge point from the site during construction on the eastern boundary opposite Rogers Road is illustrated in Figure 3.2 below.

Figure 3.2: Site Layout showing existing overland flow path and discharge point

No water is to be discharged off site until it is tested. Water is to be tested and treated as necessary to meet the following water quality criteria:

- TSS: ≤ 50mg/L (~Turbidity 30NTU). If this cannot be achieved though natural settling, then the trapped sediment laden water is to be flocculated with gypsum applied at a rate of approx. 40kg/100m3.
- pH: Between 6.5 and 8.5
- No visible oil and grease

Prior approval from the Project's Environmental Representative (PER) is also required before any water can be discharged off-site.

3.2.4 Flooding

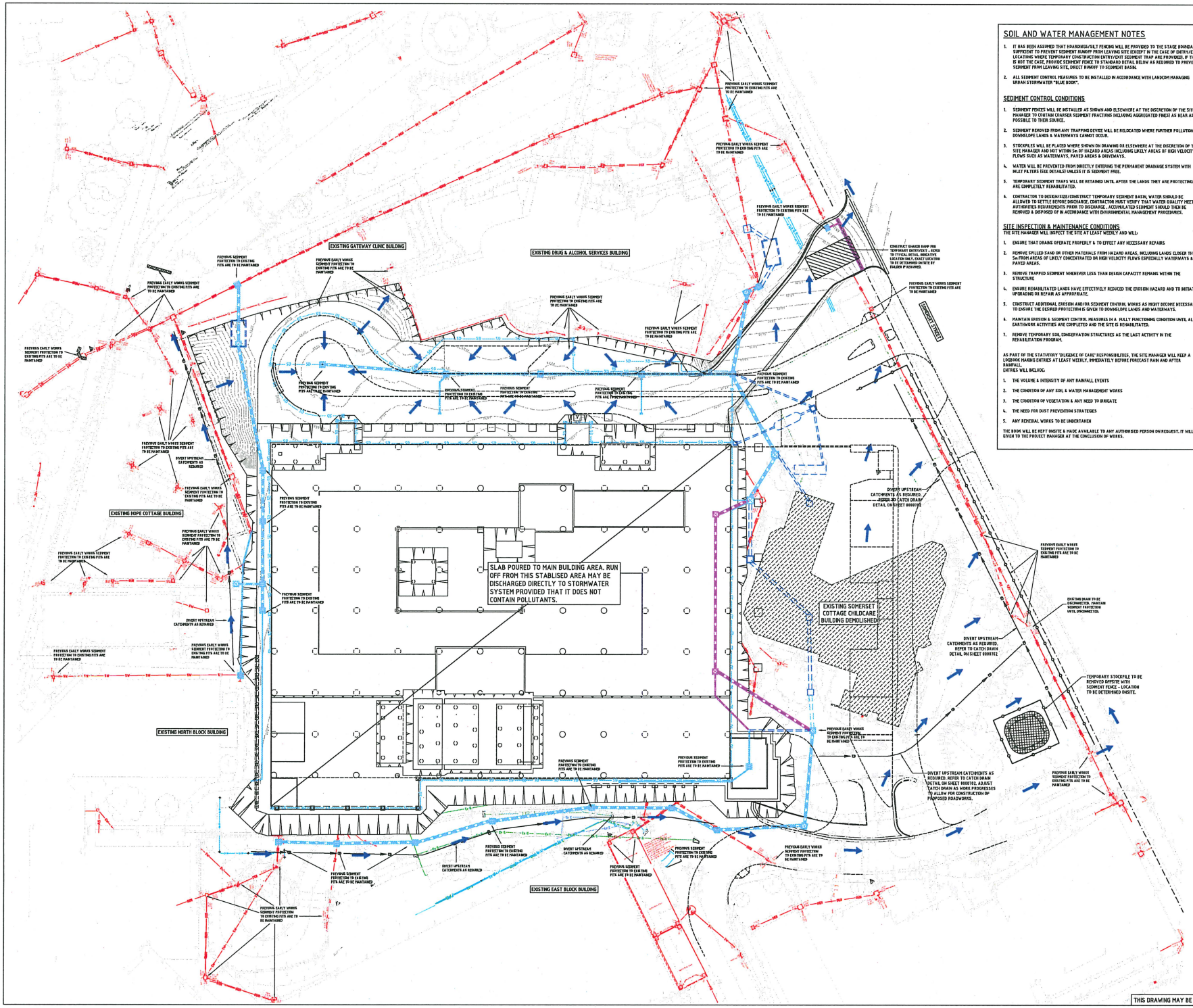
The site boundaries have been compared to flood modelling results prepared by Catchment Simulation Solutions dated 5th June 2017 (College, Orth and Werrington Creeks Catchment Overland Flow Flood Study Final Report). The findings of which indicate that the majority of the sites is not at risk of flooding under the 100-year ARI design storm event and PMF except the northern side of the subject site at Drug and Alcohol Buildings with the estimated PMF level of approximately 49 m. To avoid flooding impact, the sites at the location mentioned above would be laid out to avoid placement of material (i.e. stockpiles, storage of equipment) in flood affected areas. Additionally, the measures shown in Appendix B should be implemented to mitigate the impacts of stormwater and flood flows during storm events.

4. Conclusion and Recommendations

It is the contractor's responsibility to comply with the above measures and the following recommendations:

- Nomination of a suitably qualified environmental representative on site to complete self-audits and monitor Construction Soil and Water Management Sub-Plan (CSWMSP).
- Continuous improvement/amendment of this Sub-Plan will be required to achieve by on-going evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

Appendix A
Soil and Water Management Plan and Details



SOIL AND WATER MANAGEMENT NOTES

1. IT HAS BEEN ASSUMED THAT HOARDINGS/SILT FENCING WILL BE PROVIDED TO THE STAGE BOUNDARY SUFFICIENT TO PREVENT SEDIMENT RUNOFF FROM LEAVING SITE (EXCEPT IN THE CASE OF ENTRY/EXIT LOCATIONS WHERE TEMPORARY CONSTRUCTION ENTRY/EXIT SEDIMENT TRAP ARE PROVIDED). IF THIS IS NOT THE CASE, PROVIDE SEDIMENT FENCE TO STANDARD DETAIL BELOW AS REQUIRED TO PREVENT SEDIMENT FROM LEAVING SITE, DIRECT RUNOFF TO SEDIMENT BASIN.
2. ALL SEDIMENT CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH LANDCOM MANAGING URBAN STORMWATER "BLUE BOOK".

SEDIMENT CONTROL CONDITIONS

1. SEDIMENT FENCES WILL BE INSTALLED AS SHOWN AND ELSEWHERE AT THE DISCRETION OF THE SITE MANAGER TO CONTAIN COARSER SEDIMENT FRACTIONS INCLUDING AGGREGATED FINES) AS NEAR AS POSSIBLE TO THEIR SOURCE.
2. SEDIMENT REMOVED FROM ANY TRAPPING DEVICE WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS & WATERWAYS CANNOT OCCUR.
3. STOCKPILES WILL BE PLACED WHERE SHOWN ON DRAWING OR ELSEWHERE AT THE DISCRETION OF THE SITE MANAGER AND NOT WITHIN 5m OF HAZARD AREAS INCLUDING LIKELY AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS & DRIVEWAYS.
4. WATER WILL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM WITH INLET FILTERS (SEE DETAILS) UNLESS IT IS SEDIMENT FREE.
5. TEMPORARY SEDIMENT TRAPS WILL BE RETAINED UNTIL AFTER THE LANDS THEY ARE PROTECTING ARE COMPLETELY REHABILITATED.
6. CONTRACTOR TO DESIGN/SIZE/CONSTRUCT TEMPORARY SEDIMENT BASIN, WATER SHOULD BE ALLOWED TO SETTLE BEFORE DISCHARGE. CONTRACTOR MUST VERIFY THAT WATER QUALITY MEETS AUTHORITIES REQUIREMENTS PRIOR TO DISCHARGE. ACCUMULATED SEDIMENT SHOULD THEN BE REMOVED & DISPOSED OF IN ACCORDANCE WITH ENVIRONMENTAL MANAGEMENT PROCEDURES.

SITE INSPECTION & MAINTENANCE CONDITIONS

THE SITE MANAGER WILL INSPECT THE SITE AT LEAST WEEKLY AND WILL:

1. ENSURE THAT DRAINS OPERATE PROPERLY & TO EFFECT ANY NECESSARY REPAIRS
2. REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5m FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS & PAVED AREAS.
3. REMOVE TRAPPED SEDIMENT WHENEVER LESS THAN DESIGN CAPACITY REMAINS WITHIN THE STRUCTURE
4. ENSURE REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND TO INITIATE UPGRADING OR REPAIR AS APPROPRIATE.
5. CONSTRUCT ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS.
6. MAINTAIN EROSION & SEDIMENT CONTROL MEASURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS REHABILITATED.
7. REMOVE TEMPORARY SOIL CONSERVATION STRUCTURES AS THE LAST ACTIVITY IN THE REHABILITATION PROGRAM.

AS PART OF THE STATUTORY 'DILIGENCE OF CARE' RESPONSIBILITIES, THE SITE MANAGER WILL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL.
ENTRIES WILL INCLUDE:

1. THE VOLUME & INTENSITY OF ANY RAINFALL EVENTS
2. THE CONDITION OF ANY SOIL & WATER MANAGEMENT WORKS
3. THE CONDITION OF VEGETATION & ANY NEED TO IRRIGATE
4. THE NEED FOR DUST PREVENTION STRATEGIES
5. ANY REMEDIAL WORKS TO BE UNDERTAKEN

THE BOOK WILL BE KEPT ONSITE & MADE AVAILABLE TO ANY AUTHORISED PERSON ON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF WORKS.

SOIL AND WATER MANAGEMENT LEGEND

- SEDIMENT FENCE
- TEMPORARY SHAKER RAMP FOR ENTRY/EXIT
- DISTURBED AREA
- FINISHED SURFACE CONTOUR
- GEOTEXTILE PIT FILTER / FILTER SURROUND INSTALLED ON EXISTING PIT
- SANDBAGS INSTALLED ON EXISTING PIT
- STRAW BALE FILTER
- SW — EXISTING STORMWATER LINE SUPPLIED BY:
  - CARDNO PTY LTD DRAWING No. 70117SRE REV 04 DATED 07.06.2017
  - SURESEARCH UNDERGROUND SERVICES PTY LTD DRAWING FILE NAME 56628-CP9_NEPEAN HOSPITAL_V5 REV 1 DATED 01.09.2016
- EXISTING EARLY WORKS STORMWATER LINE. REFER TO DRAWING SHEET NHR-BON-DRW-CV-TB1-ALL-0000151
- 10 — EXISTING EARLY WORKS SUBSOIL DRAINAGE LINE. REFER TO DRAWING SHEET NHR-BON-DRW-CV-TB1-ALL-0000151
- TEMPORARY STORMWATER LINE DIVERSION. REFER TO DRAWING SHEET NHR-BON-DRW-CV-TB1-ALL-0000151
- TEMPORARY 300 WIDE GRATED DRAIN. REFER TO DRAWING SHEET NHR-BON-DRW-CV-TB1-ALL-0000151
- PROPOSED MAIN WORKS STORMWATER LINE. REFER TO DRAWING SHEET NHR-BON-DRW-CV-TB1-ALL-0000720
- OVERLAND FLOW
- CD — CATCH DRAIN

DIAL BEFORE YOU DIG www.1100.com.au The Essential First Step

ALL EXISTING PROPERTY SERVICES' LOCATIONS AND DEPTHS ARE APPROXIMATE AND MUST BE VERIFIED ON SITE. THE CONTRACTOR SHOULD SUPPLY PRECISE LOCATIONS AND DEPTHS TO THE ENGINEER FOR REVIEW PRIOR TO ANY WORKS THAT MAY AFFECT THESE SERVICES.

WARNING
NO DRAINAGE WORKS SHALL COMMENCE UNTIL THE CONTRACTOR CONFIRMS THE I.L. OF ALL EXISTING DRAINS, AND CONFIRMS IN WRITING WITH THE ENGINEERING SUPERVISOR.

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

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BONACCI

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NOTE
ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE TRADE PACKAGE COVER SHEET AND DATES

ISSUE	DATE	FOR
1	24.05.19	ISSUED FOR CONSTRUCTION
2	27.05.19	ISSUED FOR CONSTRUCTION
3	11.06.19	ISSUED FOR CONSTRUCTION
4	30.07.19	ISSUED FOR CONSTRUCTION

CLIENT
NSW GOVERNMENT Health Infrastructure
HEALTH INFRASTRUCTURE
MAIN/CIVIL CONTRACTOR
CBRE
PROJECT MANAGERS
CBRE
TEL 02 9333 3333
HIGH STREET
BVN Architecture
TEL 02 8297 7200
STRUCTURE / CIVIL
BONACCI
TEL 02 8247 8400
FACADE / CITE
SURFACE DESIGN
TEL 02 9249 1400
ROADS
BLACKETT MAGUIRE + GOLDSMITH
TEL 02 8211 7777
FIRE ENGINEERING
ARUP
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LANDSCAPE
ARCADIA
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FREDON AIR
TEL 02 9475 9400
ELECTRICAL / COMMS
STAR ELECTRICAL
TEL 02 9708 7555
HYDRAULIC
AXIS SERVICES GROUP
TEL 02 8708 5666
FIRE HYDRANTS
FORCE FIRE
TEL 1300 667 704
MEDICAL GAS
HOSLAB
TEL 02 8816 3555
PNEUMATIC TUBES
LAMSON GROUP
TEL 02 9743 7322
PROJECT
NEPEAN HOSPITAL REDEVELOPMENT (NHR)
DERBY STREET,
KINGSWOOD NSW 2747
BONACCI PROJECT NUMBER
2021820
DRAWING KEY

TRUE NORTH | PROJECT NORTH

SCALE
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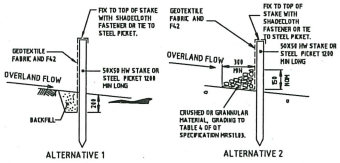
1:500 | 1:1000 | 1:2000
1:200mm
DRAWN BY JF | CHECKED BY RH
SCRIBED BY JH | APPROVED BY TH
STATUS
CONSTRUCTION
DRAWING

MAIN WORKS PHASE 3
SOIL AND WATER MANAGEMENT PLAN

DRAWING NUMBER
NHR-BON-DRW-CV-TB1-ALL-0000701
ISSUE
4

30.07.20 5:07 PM



SEDIMENT FENCE

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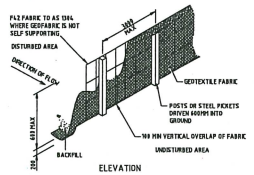

TEMPORARY CONSTRUCTION VEHICLE ENTRY/EXIT SEDIMENT TRAP

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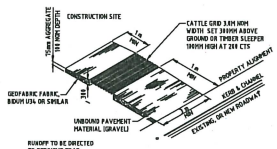

GEOTEXTILE PIT FILTER 1

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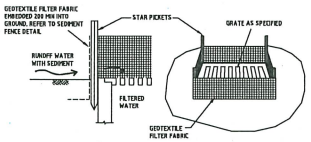

GEOTEXTILE PIT FILTER 2

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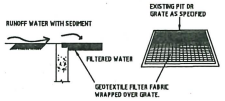

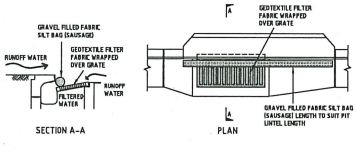

KERB INLET SEDIMENT TRAP

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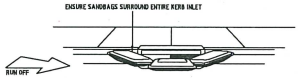

SANDBAG KERB INLET SEDIMENT TRAP

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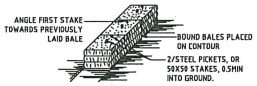

STRAW BALE BANK SEDIMENT CONTROL

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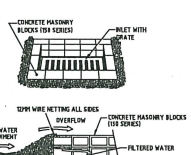

FIELD INLET SEDIMENT TRAP

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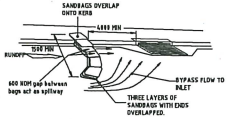

ON GRADE KERB INLET SEDIMENT TRAP

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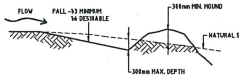

CATCH DRAIN

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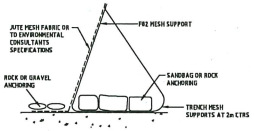

ALTERNATIVE SEDIMENT FENCE

NOT TO SCALE

ALTERNATIVE SEDIMENT FENCE NOTES

1. INSTALL THIS TYPE OF SEDIMENT FENCE WHEN USE OF SUPPORT POSTS IS NOT DESIRABLE OR NOT POSSIBLE. SUCH CONDITIONS MIGHT APPLY, FOR EXAMPLE, WHERE APPROVAL IS GRANTED FROM THE APPROPRIATE AUTHORITIES TO PLACE THESE FENCES IN HIGHLY SENSITIVE ESTUARINE AREAS.
2. USE BENT TRENCH MESH TO SUPPORT THE F82 WELDED MESH FACING AS SHOWN ON THE DRAWING ABOVE. ATTACH THE JUTE MESH TO THE WELDED MESH FACING USING UV-RESISTANT CABLE TIES.
3. STABILISE THE WHOLE STRUCTURE WITH SANDBAG OR ROCK ANCHORING OVER THE TRENCH MESH AND THE LEADING EDGE OF THE JUTE MESH. THE ANCHORING SHOULD BE SUFFICIENTLY LARGE TO ENSURE STABILITY OF THE STRUCTURE IN THE DESIGN STORM EVENT, USUALLY THE 10 YEAR EVENT.

SITE IS TO BE DIVIDED INTO 3 DISTURBED CATCHMENTS.
ANNUAL SOIL LOSS FROM THE 3 DISTURBED CATCHMENTS = [50×0.430 + 170×0.260 + 139×0.043] = 29.36 m^3/YR
IN GENERAL WHERE THERE IS LESS THAN 150 CUBIC METRES PER YEAR OF SOIL LOSS, THE BUILDING OF A SEDIMENT RETENTION BASIN CAN BE CONSIDERED UNNECESSARY (SECTION 6.3.2 "THE BLUE BOOK" BY LANDCOM). NONETHELESS, THE EXCAVATION OF THE MAIN TOWER PIT MAY ACT AS A SEDIMENT BASIN AND SEDIMENT EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH "THE BLUE BOOK" BY LANDCOM TO ENSURE SITE WATER QUALITY MEETS RELEVANT AUTHORITY'S REQUIREMENTS PRIOR TO DISCHARGE.

SWMP Commentary, Detailed Calculations

Note: These "Detailed Calculation" spreadsheets relate only to high erosion hazard lands as identified in figure 4.6 or where the designer chooses to use the RUSLE to size sediment basins. The "Standard Calculation" spreadsheets should be used on low erosion hazard lands as identified by figure 4.6 and where the designer chooses not to run the RUSLE in calculations.

1. Site Data Sheet

Site Name: Nepean Main Tower

Site Location: Nepean Hospital

Precinct: MAIN WORKS - PHASE 2

Description of Site: Area 1: Eastern Roadworks, Area 2: Southern Landscape, Area 3: Demolish temporary ED Access Road

Site area	Site 1	Site 2	Site 3				Remarks
Total catchment area (ha)	0.43	0.26	0.04				
Disturbed catchment area (ha)	0.43	0.26	0.04				
Soil analysis							
% sand (fraction 0.02 to 2.00 mm							Soil texture should be assessed through mechanical dispersion only. Dispersing agents (e.g. Calgon) should not be used
% 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)
Soil Texture Group							See Section 6.3.3(c), (d) and (e)
Rainfall data							
Design rainfall depth (days)	5	5	5				See Sections 6.3.4 (d) and (e)
Design rainfall depth (percentile)	80	80	80				See Sections 6.3.4 (f) and (g)
x-day, y-percentile rainfall event	27.4	27.4	27.4				See Section 6.3.4 (h)
Rainfall intensity: 2-year, 6-hour storm	7.97	7.97	7.97				See IFD chart for the site
							AR&2016 IFD DATA ADOPTED
RUSLE Factors							
Rainfall erosivity (R-factor)	1530	1530	1530				Automatic calculation from above data
Soil erodibility (K-factor)	0.04	0.04	0.04				K-FACTOR ADOPTED FOR THE BLACKTOWN REGION IN PENRITH SOIL LANDSCAPE GROUP
Slope length (m)	80	80	40				
Slope gradient (%)	4	1	3				RUSLE data can be obtained from Appendixes A, B and C
Length/gradient (LS-factor)	0.91	0.19	0.47				
Erosion control practice (P-factor)	1.3	1.3	1.3				CONTRACTOR TO ENSURE SLOPE LENGTH AND GRADIENT IS NOT EXCEEDED DURING SOIL DISTURBANCE
Ground cover (C-factor)	1	1	1				
Calculations							
Soil loss (t/ha/yr)	72	15	37				
Soil Loss Class	1	1	1				See Section 4.4.2(b)
Soil loss (m^3/ha/yr)	56	12	29				
Sediment basin storage volume, m^3	4	1					See Sections 6.3.4(i) and 6.3.5 (e)

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NOTE
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NSW GOVERNMENT Health Infrastructure
HEALTH INFRASTRUCTURE
HAWKINS CONSTRUCTION
PROJECT MANAGERS
CBRE
TEL 02 9333 3333
ARCHITECT
BVN Architecture
TEL 02 8297 7200
STRUCTURAL/CIVIL
BONACCI
TEL 02 8247 8400
FACADE/ESD
SURFACE DESIGN
TEL 02 9249 1400
BCA/DDA
BLACKETT MAGUIRE + GOLDSMITH
TEL 02 9211 7777
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FIRE (HYDRANT)
FORCE FIRE
TEL 1300 667 704
MEDICAL GAS
HOSLAB
TEL 02 9816 3555
PNEUMATIC TUBES
LAMSON GROUP
TEL 02 9743 7322
PROJECT
NEPEAN HOSPITAL REDEVELOPMENT (NHR)
DERBY STREET, KINGSWOOD NSW 2747
BONACCI PROJECT NUMBER
2021820
DRAWING KEY

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SCALE
NOT TO SCALE @A0 DO NOT SCALE @A1
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STATUS
CONSTRUCTION
DRAWING

MAIN WORKS PHASE 2
SOIL AND WATER MANAGEMENT DETAILS

DRAWING NUMBER
NHR-BON-RW-CIV-TB1-ALL-0000702
ISSUE
1

24.02.20 10:49 AM

Appendix B
Mitigation Measures during Storm Events

Measure/Requirement	When to implement	Responsibility	Storm events (Minor/Major)
Maintain overland flow path from Barber Ave to Somerset St, passing to the North of Gateway Clinic and the Drug and Alcohol Unit	Construction	Construction Manager / Enviornmental Site Representative	Both Minor and Major
Monitoring of weather forecasts and during rainfall events	Construction	Construction Manager / Enviornmental Site Representative	Both Minor and Major
Site Sheds and chemical stores to be placed out of flood affected areas	Construction	Construction Manager / Enviornmental Site Representative	Major
Site Inspection to be completed to ensure all erosion and sediment controls are in place prior to the storm events.	Construction	Construction Manager / Enviornmental Site Representative	Both Minor and Major
Debris and rubble to be prevented from discharging out of the site.	Construction	Construction Manager / Enviornmental Site Representative	Both Minor and Major
Disturbance and turbidity to be contained by installing self-containment such as silt curtains	Construction	Construction Manager / Enviornmental Site Representative	Both Minor and Major
Where applicable, temporary levess or bunds to be strategically placed to contain potential flooding impacts resulting from any temporary works on the floodplain and minimise the risk to surrounding properties which might otherwise be affected	Construction	Construction Manager / Enviornmental Site Representative	Major
Temporary sandbags or diversions to be strategically placed to partially divert excessive floodwater flows from the site and prevent overloading of stormwater dains and loss of large amounts of soil from site. Internal drainage systems to be inspected, reviewed and bolstered as necessary	Construction	Construction Manager / Enviornmental Site Representative	Major
In the event of flooding, the requirements set out in the Flood Emergency Response Plan (FERSP) to be implemented.	Construction	Construction Manager / Enviornmental Site Representative	Major

Note: Minor - up to 20 year ARI storm events
Major - from 20 to 100 year ARI storm events

10. Flood Emergency Response Plan

Nepean Hospital Redevelopment – Flood Emergency Response Plan

Bonacci Group (NSW) Pty Ltd Consulting Engineers
Level 6, 37 York Street, Sydney NSW 2000 Australia ABN 29 102 716 352 T: +61 2 8247 8400
reception.syd@bonaccigroup.com bonaccigroup.com

Document Status Note:

Revision	Date Issued	Prepared by	Updated by	Approved by	Title
A	29/03/2019	VC		SN	Associate Director
B	05/04/2019	VC		SN	Associate Director
C	01/08/2019	VC		SN	Associate Director
D	15/08/2019	VC		SN	Associate Director
E	04/03/2020		JB	SN	Associate Director
F	17/09/2020			GD	Principal Engineer
G	24/02/2021			GK	Senior Civil Engineer

Prepared by: Vincent Chu – Principal Civil Engineer

Updated by: George Krzywda - Senior Civil Engineer

Date: 24 February 2021

Project Name: Nepean Hospital

BG Project No: 20 21820

Discipline: Civil Engineering

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Report Amendment Register

Rev. No.	Section & Page No.	Issue/Amendment	Updated/Initials	Reviewer/Initials	Date
F		Reviewed – No Changes		GD	17/09/2020
G		Reviewed – No Changes		GK	24/02/2021

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1. Introduction

This Flood Emergency Response Sub-Plan (FERSP) has been developed as part of the Construction Environmental Management Plan (CEMP) to promote a satisfactory awareness of expected flood behavior and risks, identify measures to become flood prepared and recommend a course of action during and after flood events. This FERSP has been prepared to fulfil the Conditions of Consent issued by the Minister for Planning for the Project, specifically Condition B26.

2. Flooding

The site boundaries have been compared to flood modelling results prepared by Catchment Simulation Solutions dated 5th June 2017 (College, Orth and Werrington Creeks Catchment Overland Flow Flood Study Final Report). The findings of which indicate that the majority of the site is not at risk of flooding in the critical duration 100-year ARI design storm event and PMF. The exception is the northern side of the subject site at the Drug and Alcohol Building, which is shown as affected in all events (as it appears that the flood model has picked up the area on the southern side of the Drug and Alcohol building to the carpark as a trapped low point – this is an anomaly, as there is an overland flow path around the building that will ensure that this area drains), with the estimated PMF flood level of approximately 49 m.

Figure 1 – 1%AEP Event Flood Extract

3. Provision of Regional and Local Flood Plans

Upon reviewing the relevant materials listed below, the following points demonstrate the proposed Flood Emergency Response Plan is consistent with Hawkesbury Nepean Flood Emergency Sub Plan and Penrith City Council Flood Plan.

- According to the Nepean River Flood Study prepared by Advisian (WorleyParsons Group) dated 12 November 2018 (i.e. this flood study is prepared for Penrith City Council), the subject site (Nepean Hospital) is not impacted by the regional flood from Nepean River in the 100-year ARI design storm event and PMF.

- According to Hawkesbury Nepean Flood Emergency Sub Plan, the subject site is not defined as part of Penrith North and Penrith Evacuation Sectors. Therefore, the evacuation route defined in Sub Plan is not applicable to the subject site. For details, refer to Hawkesbury Nepean Flood Emergency Sub Plan Chapter 4 of Volume 3.
- The Flood and Evacuation Warnings details presented in Section 4 of this plan is consistent with Section 5.2, Volume 1 of Hawkesbury Nepean Flood Emergency Sub Plan.
- The College, Orth and Werrington Creeks Catchment Overland Flow Flood Study (June 2017) was prepared for Penrith City Council to identify mainstream and overland flood behavior across the catchment. This flood study is considered to be part of Penrith City Council Flood Plan. The findings of which indicate that the majority of the site is not at risk of flash flooding (i.e. overland flow) in the critical duration of the 100-year ARI design storm event and PMF.

Based on the above, the details presented in this Plan does not contradict the Hawkesbury Nepean Flood Emergency Sub Plan. It can be concluded that this Plan is therefore considered consistent with Hawkesbury Nepean Flood Emergency Sub Plan. As this Plan is developed based on the outcomes / details from College, Orth and Werrington Creeks Overland Flow Flood Study, it is also considered consistent with Penrith City Council Flood Plan.

4. Flood and Evacuation Warnings

A network of rainfall gauge stations is maintained by Bureau of Meteorology (BOM). These provide information to the BOM as one source of information informing their flood warning system. The BOM should issue one of five types of warnings through local radio, television and their website – http://www.bom.gov.au. In addition, the State Emergency Service (SES) may issue a flood bulletin, evacuation waring or evacuation order. The different warning types are as below.

4.1 Severe Weather Warning

Severe weather warnings are issued by the BOM for potentially dangerous weather conditions. A description of the threat will be included in the warning along with the time for next issue. It is noted that a severe weather warning does not imply that flooding will eventuate. Warnings are generally updated every six hours or as the event dictates.

4.2 Severe Thunderstorm Warning

A severe thunderstorm warning will be issued if there is strong evidence that a severe thunderstorm will develop or if a severe thunderstorm is reported. Flash flooding may occur during severe thunderstorms. Warnings are generally updated every three hours or shorter as required.

4.3 Flood Alert

A flood alert will be issued if flood producing rain is expected. This provides an early warning that flooding may occur.

4.4 Generalized Flood Warning

A generalized flood warning is to be issued when flooding is expected to occur in a given area. Three hours warning time is expected from issue of warning to peak flood level as per the “Service Level Specification for Flood Forecasting and Warning Services for New South Wales – Version 2.0” (BOM, 2013).

This is the most likely warning type for the subject site should evacuation need to occur.

4.5 Minor/Moderate/Severe Flood Warning

A more detailed flood warning may be issued based on any additional information available. Three hours warning time is expected from issue of warning to peak flood level.
Real time river and harbour height data is available from the BOM website.
(http://www.bom.gov.au/nsw/flood/)

4.6 SES Flood Bulletins

The SES may issue a flood bulletin providing information of the likely flood consequences and recommended actions.

4.7 Evacuation Warning

The SES may issue an evacuation warning allows time to prepare for evacuation.

4.8 Evacuation Order

The SES will issue an Evacuation Order if evacuation is required. If this occurs, evacuation must be undertaken. Broadcast will be through radio/TV, automated telephone message or SMS.

5. Assembly Point and Evacuation Routes

The area adjacent to East Block and at the southern side of subject site has been nominated as the emergency assembly point. Levels in this area are approximately 52.5m AHD which is above the PMF levels of 49m at the northern side of the subject site.

Once everyone is accounted for, evacuation will be undertaken to the agreed refuge under the control of the Flood Wardens. The nominated refuge point is the Public Car Park located at the south-west of the subject site. This location with levels of approximately 56m AHD is above the PMF level of 49m at the northern side of the subject site and provide safe refuge until the flood event has passed. The locations of emergency assembly point and nominated refuge point and evacuation route are shown in Figure 2 below.

Figure 2 – Evacuation Route during Construction

On-site refuge (i.e. second level or above) is also recommended for this site during operation of the hospital as minimum floor level of the proposed hospital building is at 49.02m AHD which is slightly above the PMF level.

6. Flood Response Preparation

6.1 Evacuation Drills and Trainings

Evacuation drills and trainings are designed to increase flood awareness within the site population. These drills and training are to be undertaken twice yearly to familiarize the employees and contractors of the procedures when responding to a flood event. It is an opportunity to outline flood levels and the dangers of entering flood water.

A map of the flood evacuation route, signage and notice should be displayed at a noticeable location of the subject site to raise awareness.

7. Conclusion

Although the majority of the site is not at risk of flooding under the 100-year ARI design storm event and PMF except the northern side of the subject site at Drug and Alcohol Buildings, it is still recommended to evacuate offsite to nominated refuge points in the event of a major flood. On-site refuge is only recommended for this site during operation of the proposed hospital.

This plan should be revised if the flood study for the subject site is revised to capture changes in the catchment since the last study.

11. Remediation Action Plan

CPB Contractors Pty Ltd

Remedial Action Plan

SSDA Main Works
Nepean Hospital Redevelopment
Nepean Hospital, Kingswood, NSW 2747

5 February 2021

54794/118777 (Rev 3)

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CPB Contractors Pty Ltd

Remedial Action Plan

SSDA Main Works
Nepean Hospital Redevelopment
Nepean Hospital, Kingswood, NSW 2747

5 February 2021

54794/118777 (Rev 3)

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Executive Summary

JBS&G Australia Pty Ltd (JBS&G) was engaged by CPB Contractors Pty Ltd (CPB, the client) to prepare a Remedial Action Plan (RAP) for the Main Works project of the Nepean Hospital Redevelopment located at Nepean Hospital, Derby St, Kingswood NSW (the site). The Stage 1 Tower Footprint is formally identified as Part Lot 1 in DP1114090 and has a total area of approximately 25,900 m^2. The site location and site layout are presented on **Figure 1** and **Figure 2** respectively.

It is understood that the redevelopment will involve civil earth works across the extent of the site which will result in surplus soil requiring off-site disposal as a result of landscaping, piling/footing installation, services infrastructure construction, as well as refurbishment/demolition of a number of existing buildings. Bulk excavation to facilitate the installation of the new main hospital building will occur in the location of the current on-grade carpark.

A range of previous environmental assessments have been undertaken by Environmental Investigation Services (EIS) across the Nepean Hospital Campus to facilitate the current redevelopment including:

- *Preliminary Environmental Site Assessment (Contamination), Proposed Hospital Upgrade, Nepean Hospital, Derby St, Kingswood NSW*, EIS, 24 February 2017 (EIS 2017A);
- *Preliminary Stage 2 Environmental Site Assessment, Nepean Hospital & Integrated Ambulatory Services Redevelopment – Concept & Stage 1 SSDA, Nepean Hospital, Derby St, Kingswood NSW*, EIS, 18 December 2017 (EIS 2017B);
- *Detailed Site Investigation (Asbestos Quantifications), Proposed Hospital Upgrade – Multistorey Car Park, Nepean Hospital, Derby St, Kingswood NSW, EIS*, 20 March 2018 (EIS 2018A); and
- *Data Gap Assessment (DGA), Main Works, Nepean Hospital Redevelopment, Nepean Hospital, Kingswood, NSW 2747*, JBS&G, 04 October 2018 (JBS&G 2019).

The previous environmental assessments identified the presence of non-friable (bonded) asbestos containing material (ACM) in fill material at TP259 and friable asbestos in soil at TP247 at concentrations considered to represent a potentially unacceptable risk to future receptors. To this extent, fill material present in the vicinity of both TP247 and TP259 sampling locations requires management/remediation to address the long term health exposure risks.

Furthermore, trace level[1] friable asbestos and/or bonded ACM below the site assessment criteria were identified within in-situ fill material in landscaped/garden areas at the site (BH134, BH135, MDF2, TP234, TP248 and TP270). Whilst not a concern from a long-term health exposure (contaminated land) assessment perspective, these conditions will require management from a Work Health and Safety (WHS) perspective during future activities that may result in ground disturbance in these areas of the site (i.e. during construction and/or maintenance works in these areas).

Given the presence of bonded ACM and trave level friable asbestos in soils at the site, an updated Asbestos Management Plan (AMP), inclusive of an Asbestos in Soils Register, is also required for the site.

JBS&G (2018a) considered that the site could be made suitable for the proposed hospital land use subject to development and implementation of site-specific Remedial Action Plan and Asbestos Management Plan during future redevelopment works.

[1] Trace level friable asbestos is defined as an asbestos in soil concentration of less than 0.01 mg/kg or 0.001% w/w.

The objective of this RAP is to document the procedures and standards to be followed in order to address the asbestos in soil impacts at the site, ensuring the protection of human health and the surrounding environment, such that the impact is remediated/managed in such a manner as to make the site suitable for the proposed hospital land use.

The scope of works completed for this RAP comprised:

- Review of existing environmental assessment reports (as discussed in **Section 3.2**):
- Review of the proposed development plans; and
- Preparation of the RAP.

Overall, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Sites Guidelines for the NSW Site Auditor Scheme (3nd Edition)* (EPA 2017) because they are: technically feasible; environmentally justifiable; and consistent with relevant laws, policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures detailed in this RAP and subject to the limitations in **Section 12**, it is considered the site can be made suitable for the intended hospital land use.

The existing AMP and Asbestos Register should be updated such that current/future occupational exposures may be appropriately managed under the WHS Act (2011).

Upon completion of the remediation works, a validation report shall be prepared to document that the site is suitable for the proposed hospital land use. Should onsite containment be adopted as the preferred remedial strategy, a Long Term Asbestos Management Plan will be required to be prepared and implemented at the site.

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by CPB Contractors Pty Ltd (CPB, the client) to prepare a Remedial Action Plan (RAP) for the Main Works project of the Nepean Hospital Redevelopment located at Nepean Hospital, Derby St, Kingswood NSW (the site). The Stage 1 Tower Footprint is formally identified as Part Lot 1 in DP1114090 and has a total area of approximately 25,900 m^2. The site location and site layout are presented on **Figure 1** and **Figure 2** respectively.

It is understood that the redevelopment will involve civil earth works across the extent of the site which will result in surplus soil requiring off-site disposal as a result of landscaping, piling/footing installation, services infrastructure construction, as well as refurbishment/demolition of a number of existing buildings. Bulk excavation to facilitate the installation of the new main hospital building will occur in the location of the current on-grade carpark. The proposed development plans are provided in **Appendix A.**

A range of previous environmental assessments have been undertaken by Environmental Investigation Services (EIS) across the Nepean Hospital Campus to facilitate the current redevelopment including:

- *Preliminary Environmental Site Assessment (Contamination), Proposed Hospital Upgrade, Nepean Hospital, Derby St, Kingswood NSW*, EIS, 24 February 2017 (EIS 2017A);
- *Preliminary Stage 2 Environmental Site Assessment, Nepean Hospital & Integrated Ambulatory Services Redevelopment – Concept & Stage 1 SSDA, Nepean Hospital, Derby St, Kingswood NSW*, EIS, 18 December 2017 (EIS 2017B);
- *Detailed Site Investigation (Asbestos Quantifications), Proposed Hospital Upgrade – Multistorey Car Park, Nepean Hospital, Derby St, Kingswood NSW, EIS*, 20 March 2018 (EIS 2018A). *EIS (2018a) was not within the site and was located to the west of the site*; and
- *Data Gap Assessment (DGA), Main Works, Nepean Hospital Redevelopment, Nepean Hospital, Kingswood, NSW 2747*, JBS&G, 04 October 2018 (JBS&G 2019).

The previous environmental assessments identified the presence of non-friable (bonded) asbestos containing material (ACM) in fill material at TP259 and friable asbestos in soil at TP247 at concentrations considered to represent a potentially unacceptable risk to future receptors. To this extent, fill material present in the vicinity of both TP247 and TP259 sampling locations requires management/remediation to address the long term health exposure risks.

Furthermore, trace level[2] friable asbestos and/or bonded ACM below the site assessment criteria were identified within in-situ fill material in landscaped/garden areas at the site (BH134, BH135, MDF2, TP234, TP248 and TP270). Whilst not a concern from a long-term health exposure (contaminated land) assessment perspective, these conditions will require management from a Work Health and Safety (WHS) perspective during future activities that may result in ground disturbance in these areas of the site (i.e. during construction and/or maintenance works in these areas).

Given the presence of bonded ACM and trave level friable asbestos in soils at the site, an updated Asbestos Management Plan (AMP), inclusive of an Asbestos in Soils Register, is also required for the site.

[2] Trace level friable asbestos is defined as an asbestos in soil concentration of less than 0.01 mg/kg or 0.001% w/w.

JBS&G (2018a) considered that the site could be made suitable for the proposed hospital land use subject to development and implementation of site-specific Remedial Action Plan and Asbestos Management Plan during future redevelopment works.

This RAP was developed in accordance with guidelines made or approved by the NSW Environment Protection Authority (EPA) and relevant Australian Standards.

1.2 Objective

The objective of this RAP is to document the procedures and standards to be followed in order to address the asbestos in soil impacts at the site, ensuring the protection of human health and the surrounding environment, such that the impact is remediated/managed in such a manner as to make the site suitable for the proposed hospital land use.

1.3 Scope of Works

The scope of works completed for this RAP comprised:

- Review of existing environmental assessment reports (as discussed in **Section 3.2**):
- Review of the proposed development plans; and
- Preparation of the RAP.

2. Site Conditions and Surrounding Environment

2.1 Site Identification

The location of the site shown on **Figure 1**. The layout of the site and approximate site boundary are shown on **Figure 2**. The site details are summarised in **Table 2.1**.

Table 2.1: Summary Site Details

Site Address	Derby St, Kingswood NSW, 2747
Lot / DP	Part Lot 1 in DP1114090
Local Government Authority	Penrith City Council
Site Owner	Health Administration Corporation
Site Area	The site area is approximately 25,900 m^2
Approximate Geographical Coordinates (MGA 56)	Easting: 288332.56 Northing: 6262216.79
Zoning	SP2 Infrastructure – Health Services Facility
Previous Land-use	Agricultural and carparking.
Current Land-use	Health Services Facility including child care centre
Proposed Land-use	Health Services Facility

2.2 Site Description

A detailed site investigation event was undertaken on 25 July to 06 August 2018 with additional investigations conducted on 18 to 19 September 2018. Both sampling events were conducted by JBS&G's trained and experienced field scientists. Site features are presented on **Figure 2**.

The site is an irregular shape formed by existing hospital buildings beyond the extent of the proposed works. The site is located in the eastern portion of the hospital campus and is generally constrained by existing hospital buildings.

The site at the time of the investigation was characterised by:

- A large on-grade carpark in the central portion of the site;
- A retaining wall located at the northern extent of the aforementioned on-grade carpark, which retains materials within the northern portion of the carpark;
- smaller road and on-grade car parking spaces in the north-western portion of the site;
- a child care centre in the south-eastern portion of the site;
- a covered walkway traversing the site north-east to south-west in the central northern portion of the site; and
- landscaped and turfed areas throughout the site.

The following buildings were present on the site at time of inspection:

- Population Health;
- Disaster Room;
- Doctors Accommodation;
- Hope Cottage;
- Short Term Equipment Services;
- Meeting Hub; and
- Somerset Cottage Child Care Centre.

No soil sampling was undertaken beneath the existing building footprints. Buildings were single level structures, and comprised varied brick, cladding and corrugated metal construction. Further information on the presence of hazardous buildings materials within the on-site buildings is provided in the concurrent Hazardous Building Materials Survey (HMBS, JBS&G 2018[3]).

No aboveground or underground storage tanks (AST/UST) were identified on the site at the time of inspection. No dangerous or hazardous goods were observed to be stored in the external portions of the site.

Fill material was observed to be present across the majority of the site to create site levels, road/carpark infrastructure and in the form of raised landscaped mounds. Landscaped and turfed areas were variable in ground coverage, with some areas of mulch, leaf litter, turf or exposed soils.

No asbestos containing material (ACM) was observed on the ground surface. Fragments of ACM were observed at two sample locations (TP259 and TP270) during asbestos quantification (AQ) sampling within fill material comprising minor anthropogenic inclusions such as bricks and concrete fragments. No odours or staining were observed on the within soils at the site.

2.3 Surrounding Land-use

The surrounding land-uses of the site are detailed below, with consideration to the irregular shape of the site.

North – Great Western Highway road corridor with the T1 Western Railway Line further afield bounded the northern most portion of the site. Commercial / industrial properties are located to the north of the railway lines. For the balance of the site, Barber Avenue and then the Nepean Private Hospital was located to the north of the west site portion; the North Block and East Block buildings were located to the north of the central and east portions of the site respectively.

East – The existing Cancer Care Centre, Gateway Clinic, Drug and Alcohol Services and Somerset Street bound the site to the east. Further afield were medium density apartments (3 storey buildings), an on-grade carpark used for health staff parking and low-density residential houses.

South – A range of hospital buildings including North Block, East Block and Oral Health.

West – Nepean Private Hospital bound the northern most portion of the site. Barber Avenue, North Block and East Block bound the Stage 1 Tower area to the west.

2.4 Topography

The site is located within an area of undulating to rolling low hills. The site slopes to the east from an approximate elevation of 51 m Australian Height Datum (AHD) at the north-western site boundary to an approximate elevation of 47 m AHD (Cardno Survey, 2017) at the eastern boundary near Somerset Street.

2.5 Geology and Soil

According to the Penrith 1:100 000 Geological Sheet 9130 (1983), the site is underlain by a Triassic Period geological formation, Bringelly Shale of the Wianamatta group, comprising of shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff.

Review of eSPADE[4] indicated that the site soils comprise erosional Luddenham soils, characterised by shallow dark podzolic soils or massive earthy red clays on crests, moderately deep red podzolic

[3] *Non-Destructive Hazardous Building Materials Survey, Main Works, Nepean Hospital Redevelopment, Nepean Hospital, Derby Street, Kingswood, NSW*, JBS&G, 24 August 2018 (HMBS, JB&G 2018).

[4] http://www.environment.nsw.gov.au/eSpade2Webapp# Department of Environment and Heritage, NSW Government. Accessed 04/06/2018.

soils on upper slopes, with moderately deep yellow podzolic soils and prairie soils on lower slopes and drainage lines.

Investigations encountered fill material across the site overlying residual clay soils and weathered shale, consistent with the regional geology and soils landscapes. Fill materials were reported at depths ranging from 0.1 m bgs to 2.0 m bgs (JBS&G 2019).

2.6 Acid Sulfate Soils

Review of the Acid Sulfate Soil Risk Mapping on eSPADE indicates the site is located in an area with no known occurrence of acid sulfate soils. This classification relates to sites where Acid Sulfate Soil (ASS) or Potential Acid Sulfate Soil (PASS) conditions are not known or not likely to occur. On this basis and with consideration of the site elevation, no further consideration of ASS management is required.

2.7 Hydrology

The site varies from sealed (asphalt roads, concrete and buildings) to unsealed land (turfed and landscaped areas). On this basis, rainfall at the site is expected to either infiltrate the unsealed areas of the site or be captured within the rainwater infrastructure at the site (rooftop collection and/or stormwater drains) and then enter the regional stormwater system which discharges to Werrington Creek located approximately 2 km to the east of the site.

The nearest surface water receptor is Werrington Creek, located approximately 2 km to the east of the site. Given the distance from the site, it is not anticipated any surface water generated from the site would reach Werrington Creek via overland flow paths.

2.8 Hydrogeology

No registered groundwater bores were present within 500 m of the site on the NSW Office of Water Groundwater Database[5].

It is anticipated that on a regional scale groundwater would move generally to the north following the regional topography toward the Nepean River which is located approximately 3 km from the site.

It is anticipated that on a local scale groundwater would move generally to the north-east as consistent with the site topography.

Given the relatively shallow bedrock underlying the site, it is anticipated groundwater in the vicinity of the site would be resident in cracks and deformities within the shale bedrock. As such, groundwater movement is expected to be low in volume and of a saline nature given the low permeability of the shale and its marine depositional environment.

2.9 Meteorology

Data from Penrith Lakes AWS Meteorological Station[6] approximately 5 kilometres north-west of the site has identified mean monthly temperatures range from 17.8 degrees Celsius to 31.0 degrees Celsius throughout the year. Mean monthly average rainfall figures range from 29.3 mm to 116.9 mm.

[5] http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 11/9/2017.
[6] http://www.bom.gov.au/climate/averages/tables/cw_066194.shtml. Accessed 05/06/2018.

3. Site History Summary and Previous Site Investigations

3.1 Site History Summary

A full site history was detailed in EIS 2017A. A summary of the site history is presented below.

Period	Activity
1940s	Site and broader Nepean Hospital Campus comprised vacant/broad acre agricultural land.
1950s	Nepean Hospital had been constructed to the south of the site. Some residential and commercial/industrial properties were located to the east and west of the site.
1960s to 1970s	Site remained vacant, with increased residential and commercial industrial properties apparent to the east, west and north (beyond the Western Rail line). An additional building at Nepean Hospital had been constructed (to the south of the site).
1982	Southern portion of the site was an on-grade carpark. The remainder of the site remained vacant. Additional buildings at Nepean Hospital had been constructed.
1991	The on-grade carpark had been extended to the north. A building in the location of the current child care centre had been constructed. Tresillian building was under construction.
2002	Additional health service buildings had been constructed on and adjacent to the site.
2010	EIS2017A reported than an earlier PSI report prepared by Golder that included soil and groundwater sampling across portions of the Nepean Hospital Campus was completed.
February 2017	PESA (EIS 2017A) included soil sampling at 16 locations across the Nepean Hospital Campus, including eight situated within the site.
September 2017	DESA (EIS 2017B) included soil sampling at 21 locations within the site.
October 2018	DGA (JBS&G 2018) included soil sampling at 78 locations within the site.

3.2 Previous Site Investigations

Three previous environmental reports relevant to the site were provided by the client for review. Previous sampling locations are presented on **Figure 3**.

3.2.1 Preliminary Environmental Site Assessment (EIS 2017A)

EIS (2017A) completed a PESA across the broader Nepean Hospital Campus, targeting areas of proposed redevelopment including the site. The PESA included a desktop review, site walkover and soil sampling at 16 locations (including eight locations within the site). EIS identified imported fill, fuel storage facilities, and historical agricultural use as areas of environmental concern (AECs) across the campus, including the site. A single fragment of ACM was identified during EIS site activities on the ground surface to the north of site (within the Cancer Care project footprint).

EIS considered the potential for significant, widespread soil contamination associated with fill material was low to moderate. Additional soil and groundwater investigation was recommended in areas of the site proposed to be redeveloped given the preliminary nature of this assessment.

Reported concentrations of heavy metals, PAHs, BTEX, TRH and asbestos in the eight sample locations completed within the current site boundary were reported to be below the (ecological) site assessment criteria nominated in **Section 6** with the exception of B(a)P in sample BH10-0.04-0.1 with a reported concentration of 1.9 mg/kg.

3.2.2 Preliminary Stage 2 Environmental Site Assessment, Nepean Hospital & Integrated Ambulatory Services Redevelopment – Concept & Stage 1 SSDA (EIS 2017B)

EIS (2017C) completed a Stage 2 ESA of the proposed Main Hospital Area. Soil sampling was undertaken at 17 locations, all of which fall within or directly adjacent to the site. Four groundwater monitoring wells were installed and sampled. Three of the four groundwater monitoring wells were located within the current (JBS&G) site boundaries, with MW12 located offsite to the south-west of

the site. The reported standing water levels of groundwater ranged from 1.35 m bgs to 3.67 m bgs. Concentrations of COPCs were generally below the adopted site assessment criteria (NEPC 2013 HIL/HSL – B and C, and ecological criteria) in both soil and groundwater. ACM was identified at three surface or near surface sample locations (MDF2, BH134-S and BH135) across the assessment area. EIS considered the risk to future onsite receptors from ACM to be moderate. The extent of ACM was not defined, however, EIS considered that all fill materials may be impacted by ACM. Building demolition rubble was observed in soil at a number of sample locations.

B(a)P exceeded the adopted ESL criterion at one location, BH139-0.1-0.3, with a reported concentration of 0.9 mg/kg. The minor B(a)P exceedances of ecological assessment criteria in soil in this and the prior EIS 2017A assessment were considered not to pose an unacceptable risk to future fauna and flora receptors.

In addition, reported heavy metal criteria exceedances in groundwater were considered to be typical of urban/regional groundwater conditions and were considered not to present an unacceptable risk to off-site freshwater receptors. EIS considered the site could be made suitable for the proposed redevelopment subject to implementation of a Remedial Action Plan (RAP) that addressed assessment of previously inaccessible areas, the characterisation of fill across the extent of the site, the status of the diesel UST (located further to the south-west, outside of the current site boundary) and assessment of all new areas added to the redevelopment footprint subsequent to the completion of the Stage 2 ESA.

The diesel UST is located cross-gradient to the main portion of the site and is approximately 80 metres from the proposed services upgrade trenching works.

3.2.3 Data Gap Assessment (JBS&G 2019)

JBS&G was engaged by CPB to conduct a DGA for the site. The DGA sought to address existing data gaps with respect to the characterisation of contamination conditions in soils, preliminary waste classifications of likely surplus fill material and characterisation of groundwater conditions at the site. Soil analytical results are summarised in **Tables A**, **B** and **C**. Soil sampling locations and criteria exceedances are presented on **Figure 3.**

The scope of work for the DGA comprised:

- Review of any available previous environmental assessments or audits;
- Completion of a detailed site inspection;
- Soil sampling including asbestos quantification at 78 locations;
- Sampling of four existing groundwater monitoring wells;
- Laboratory analysis of representative soil and groundwater samples;
- Assessment of the resulting data set via consideration of site contaminant criteria; and
- Preparation of this DGA report in general accordance with relevant EPA guidelines.

The following conclusions were provided within the DGA (JBS&G 2018a):

- The broader Nepean Hospital Campus is understood to have been utilised for agricultural purposes until the 1950s. The site itself was not developed until the 1970s.
- Fill material was observed across the site at depths ranging from 0.1 to 2.0 m bgs. Minor anthropogenic inclusions such as plastic, tiles and concrete and occasional ACM were identified within the fill soil matrix at sample locations. Natural soils underlying the fill material comprised clay, generally grey to mottled red in colour.

- The concentration of bonded ACM in fill material at TP259 exceeded the site criteria and therefore was considered to require management/remediation with regard to future proposed land uses. Friable asbestos in soil concentrations at TP247 also exceeded the site criteria and was also considered to represent a potentially unacceptable risk to future receptors. To this extent, fill material present in the vicinity of both TP247 and TP259 sampling locations will require management/remediation to address the long term health exposure risks.
- Concentrations of asbestos (in bonded and friable form) at all other sample locations were reported below the adopted site criteria. To this extent, other reported incidences of asbestos in soil at the site, whilst not a concern from a long-term health exposure (contaminated land) assessment perspective, will require management from a WHS perspective during future activities that may result in ground disturbance in this area of the site and as such conditions should be noted on a site Asbestos Register.
- Concentrations of B(a)P in several fill material samples were reported to exceed the established ecological assessment criteria. However, further evaluation has identified that under the proposed land use scenarios these are not considered to pose an unacceptable risk to site ecological receptors, and therefore will not require remediation/ management.
- Concentrations of other COPCs in soil samples analysed were reported below the site health and ecological assessment criteria.
- Concentrations of COPCs in groundwater sample locations were less than the site assessment criteria. The reported depth of groundwater ranged from 1.83 m to 3.84 m or 47.56 m AHD to 49.17 m AHD.
- No soil background issues, chemical mixtures, significant aesthetic issues or offsite migration risks were identified.
- Fill material at the site has a preliminary waste classification as either:
    - Special waste (asbestos) mixed with general solid waste (non-putrescible) or;
    - General solid waste (non-putrescible).
- On this basis, it was considered that, subject to development and implementation of site-specific Remedial Action Plan and Asbestos Management Plan during future redevelopment works, the site can be made suitable for the proposed hospital land use.

The following recommendations were provided within the DGA (JBS&G 2018a):

- A RAP should be prepared subsequent to identification of a firm redevelopment scenario to document the procedures and standards to be followed in order to address the identified asbestos in soil impacts, such that the identified impact is remediated / managed in a way as to make the site suitable for the proposed land use; and
- The existing AMP and Asbestos Register should be updated to include the findings of this report such that current/future occupational exposures may be appropriately managed under the WHS Act (2011).

4. Contamination Status and Conceptual Site Model

4.1 Contamination Issues and Conceptual Site Model

Based on the previous assessments of the site, contamination issues have been identified. Bonded ACM concentrations in soil at TP259 (TP259-0-0.8) exceeded the site criteria and is considered to represent a potentially unacceptable risk to future receptors. Likewise, friable asbestos in TP247 (TP247-0-0.3) exceeded the site criteria and is also considered to represent a potentially unacceptable risk to future receptors. To this extent, fill material in the vicinity of locations TP247 and TP259 will require management/remediation to address the ACM impacts.

Fill materials at TP259 were brown gravelly clays and were present across the landscaped areas in the northern portion of the site. A comprehensive asbestos quantification was undertaken across the brown gravelly clay fill materials in this portion of the site which did not identify the presence of bonded ACM, AF or FA above the adopted site criteria in any other sampling locations in the northern portion of the site. On this basis, the identified ACM at TP259 is considered to be a localised exceedance of the land use criteria based on the representative sampling completed in accordance with WA DoH (2009) and NEPC (2013). To this extent, the proposed extent of remediation in the northern portion of the site has been limited to the locality of TP259.

Friable asbestos was identified within silty sandy topsoil/garden mix fill materials at TP247. This sample location was located within garden beds constructed during the 2010/2011 redevelopment works. A comprehensive asbestos quantification was undertaken across the topsoil/garden mix fill materials within this area of the site which did not identify the presence of bonded ACM, AF or FA above the adopted site criteria in any other sampling locations. Furthermore, TP247 was located within a small, isolated garden bed between a footpath and roadway. 2 additional asbestos quantification sampling locations less than 5 metres from TP247 did not identify the presence of any bonded ACM, AF or FA above the site criteria.

On this basis, the identified FA at TP247 is considered to be a localised exceedance of the land use criteria based on the representative sampling completed in accordance with WA DoH (2009) and NEPC (2013). To this extent, the proposed extent of remediation in the southern portion of the site has been limited to the locality of TP247.

Table 4.1 below outlines the remedial extents initially nominated at each location that will require remediation and successful validation for the site to be considered suitable for permissible land uses. The approximate remedial extents are shown on **Figures 4.**

Table 4.1: Estimated Remedial Extents

Location	Contamination/Aesthetic Issue	Depth (m bgs)	Area (m)	Volume of Impact (m^3)
TP259	Bonded ACM	0.0-0.8 m bgs	5 x 5 m	~20
TP247	Friable asbestos	0.0-0.3 m bgs	7 x 7 m	~15

Note: All depths, area and volumes provided are approximate in nature based upon the findings of the previous environmental assessments at the site.

No contamination was identified in previous environmental assessment in the current on-grade carpark in the central portion of the site.

4.2 Potential Aesthetic Issues

Should earthworks result in the presence of additional visible ACM on the ground surface this would be considered to be an aesthetic concern and would require management. As per guidance in WA

DoH (2009)[7] and NEPC (2013)[8], there should be no visible ACM within accessible surface soils (top 100 mm) of the site upon completion of the development activities.

4.3 Data Gaps

Soils underlying existing buildings across the site have not been assessed to date given the existing access limitations and current site buildings/infrastructure. Subsequent to demolition and prior to construction commencement, assessment of the remaining above data gaps (as shown on **Figure 4**) is required to be undertaken in accordance with the sampling regime in **Table 8.1**. The sampling results will be compared to the adopted site validation criteria. Should contamination conditions be identified that require further management, the Unexpected Finds Protocol as discussed in **Section 7.1** will be implemented to achieve suitable remedial/management outcomes.

4.4 WHS Management

Concentrations of asbestos (in bonded and friable form) below the relevant land use criteria was identified a number of locations within the landscaped and garden bed areas at the site, but not below existing road pavements/carparks. This impact does not necessarily require remediation as discussed in **Section 4.1** above, but still requires management from a WHS perspective under NSW SafeWork NSW requirements. To this extent, it is recommended that all ground disturbance/civil works within the landscaped (non-road or carpark) areas of the site be conducted in accordance with relevant WHS requirements for asbestos exposure.

[7] *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia,* WA Department of Health, 2009 (WA DoH 2009).

[8] *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1),* National Environment Protection Council, 2013 (NEPC 2013).

5. Remediation Options

5.1 Remediation Objectives

The remediation objectives are outlined as follows:

- Removal of unacceptable risks to human health from the asbestos impacted soils such that the site is suitable for the proposed use;
- Remove unacceptable aesthetic impacts from the site;
- Assess data gaps below the existing building footprints;
- Validate the remedial works in accordance with the relevant NSW EPA Guidelines and with reference to the adopted site criteria; and
- Document the validation process.

This RAP has been prepared with reference to the following guidelines and legislation:

- *Managing Land Contamination, Planning Guidelines, SEPP 55 – Remediation of Land.* Department of Urban Affairs and Planning. NSW Environment Protection Authority (DUAP 1998);
- *Contaminated Sites: Sampling Design Guidelines, September 1995*. NSW EPA 1995 (EPA 1995);
- *Guidelines for Consultants Reporting on Contaminated Sites.* Office of Environment and Heritage, 2011 (OEH 2011);
- *Guidelines for the NSW Site Auditor Scheme (3rd Edition).* Environment Protection Authority, October 2017 (EPA 2017);
- *National Environment Protection (Assessment of Site Contamination Measure) Measure 1999 (as amended 2013).* National Environment Protection Council (NEPC 2013);
- *Work Health and Safety Regulation 2017*. NSW Government Legislation. (*WHS Regulations 2017*);
- *How to Safely Remove Asbestos - Code of Practice*. NSW Government, Safe Work NSW, 2016 (SWA 2016a);
- *How to Manage and Control Asbestos in the Workplace - Code of Practice.* NSW Government Safe Work Australia, 2016 (SWA 2016b);
- *Management of Asbestos in the Non-occupational Environment*. enHealth Council, 2005 (enHealth 2005); and
- *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.* WA Department of Health, 2009 (WA DoH 2009).

5.2 Extent of Remediation

Based on the findings of the previous investigations (refer to **Section 3**) and subject to the limitations of these investigations, the anticipated extent of the proposed remedial works is shown on **Figure 4** and summarised in **Table 4.1**.

5.3 Remedial Options

5.3.1 EPA (2017) Guidance

The *Contaminated Sites Guidelines for the NSW Auditor Scheme* (EPA 2017) provides guidance on the preference for soil remediation and management:

1. On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
2. Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;
3. Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill; and
4. Consolidation and isolation of the soil on-site by containment within a properly designed barrier.

In addition, it is also a requirement that remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed. In addition, where there are large quantities of soil with low levels of contamination, alternative strategies are required to be considered or developed (EPA 2017).

Consideration of each of the available options (EPA 2017) is presented in **Table 5.1**, taking into account the proposed future reuse of the site.

5.3.2 WA DoH (2009) Guidance

WA DoH (2009) provides specific guidance in the remediation and management of asbestos impact is referred to in the NEPC (2013) NEPM. WA DoH (2009) note the following considerations as important when assessing the acceptability of any remediation:

- Minimisation of public risk;
- Minimisation of contaminated soil disturbance; and
- Minimisation of contaminated material/soil moved to landfill.

Consideration of each of the WA DOH (2009) guidance is presented in **Table 5.1**, taking into account the proposed future reuse of the site.

Table 5.1: Remedial Options Matrix

Option of Treatment	Discussion	Conclusion
Option 1: Onsite treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level.	ACM only impacted soils Bonded ACM can be removed from impacted soils by hand-picking (emu-picking). Hand picking of ACM within fill material is labour intensive and can be costly and time consuming. The success of the remediation method is highly dependent upon the soil type and the amount of other building rubble present within the fill, and also on the adopted validation criterion. The more clayey the soil, or the more building rubble present, the harder it is to remove all ACM. Fill materials at the site are known to be clayey in nature, and will therefore inhibit the treatment process. Given the small volume of material requiring treatment, it may be uneconomical to establish the controls required to complete on-site treatment. Furthermore, there is limited space within the site to complete on-site treatment and no viable locations on the broader campus given the operational nature of the hospital campus.	A Potential Option.
	FA / AF impacted soils FA / AF are typically heterogeneously distributed throughout impacted soils and are not readily visible to the naked eye. On this basis, there is no option considered appropriate to remove asbestos fibres from impacted soils on site. Furthermore, attempted removal of FA / AF from impacted soil would results in increased disturbance of FA / AF impacted soils and therefore a greater risk of airborne asbestos fibre generation.	Not a Suitable Option.
Option 2: Offsite treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site.	ACM only impacted soils As above (Option 1), however, there are reductions in noise and dust emissions on site in comparison to onsite treatment (Option 1), but these are offset by increased truck movements. Typically, the costs associated with returning the treated materials to site may be equivalent to the costs associated with disposal to landfill. There are no offsite licensed facilities for such treatment.	Not a Suitable Option.
	FA / AF impacted soils As with Option 1, treatment of these materials is not a viable option.	Not a Suitable Option.
Option 3: Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill.	ACM only impacted soils Offsite disposal is a suitable remedial option for areas where ACM impact is present above a threshold that renders it commercially unviable to remediate for onsite reuse. This may be due to an inability to effectively remove bonded ACM due to soil type and building rubble concentration. Given the space and operational constraints of the existing site, off-site disposal of bonded ACM is a preferred option. Off-site disposal of bonded ACM impacted materials will minimise future time and cost management implications.	**A preferred option.**
	FA / AF impacted soils There are currently suitably licensed waste facilities in the Sydney Metropolitan region capable of accepting asbestos contaminated soils.	**A preferred option.**

	Offsite disposal of FA / AF impacted soils is likely the fastest method of remediation, but also involves disturbance of the FA / AF impacted materials and should be limited to excess material that cannot remain contained onsite. This option generates the highest quantity of waste, since the materials are disposed to landfill rather than retained on site (Option 4). This option also generates additional truck movements and associated fuel/emissions over Option 4. However, given the location of the FA / AF impacted soils, it is anticipated that the off-site disposal of FA / AF impacted materials will facilitate efficiencies within the redevelopment programme. Off-site disposal of FA / AF impacted materials will minimise future time and cost management implications.	
Option 4: Consolidation and isolation of the soil by on-site containment within a properly designed barrier and on-going management.	<u>ACM only impacted soil</u> Onsite containment is a suitable remedial option for areas where ACM impact is present above a threshold that renders it commercially unviable to remediate for onsite reuse. This may be due to an inability to effectively remove non-friable ACM due to soil type and building rubble concentration. The amount of material able to be contained onsite will be dependent upon final design levels and the total volumes of fill materials required. However, given the small volume of ACM impacted materials, on-site containment may not be feasible from an economic perspective. On-site containment of impacted materials is in accordance with guiding principles of ecologically sustainable development (ESD) and the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act 2001).	**A preferred option.**
	<u>FA / AF impacted soils</u> On-site containment of FA / AF impacted soils is an appropriate remedial strategy and is in accordance with state and national guidance. However, given the small volume of FA / AF impacted materials, on-site containment may not be feasible from an economic perspective. It is noted that containment of contaminated soil would require the potential exposure to contamination to be managed by the implementation of a Long Term Asbestos Management Plan (LTAMP). There must be acceptance by the ultimate custodian of the land that future controls will be implemented. Implementation of a LTAMP is considered feasible for the site given the proposed long term uses as a health services facility. On-site containment of impacted materials would be in accordance with guiding principles of ecologically sustainable development (ESD) and the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act 2001).	**A preferred option.**

5.4 Preferred Remedial Strategy

A number of potential remedial options have been outlined in **Table 5.1**. The preferred remedial strategy for the site is:

1. Offsite disposal of bonded ACM and friable asbestos impacted materials; and/or
2. Onsite containment of bonded ACM and friable asbestos impacted materials.

6. Remedial Plan

6.1 Approvals, licences and notifications

State Environment Planning Policy Number 55 (SEPP55) Remediation of Land

Under Clause 9 (d) of SEPP 55, remediation work is considered Category 1 remediation work (i.e., requiring development consent) when the development for which another State environmental planning policy or a regional environmental plan requires development consent. As per **Section 10.1**, the site is located within the boundary of the Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No .2 – 1997) (SREP20) and therefore any remediation works require development consent under SREP20.

On this basis, the proposed remedial works at the site are considered to be Category 1 Remedial Works (as per SEPP 55) and require consent.

Asbestos Works

Friable asbestos has been detected above trace levels at TP247. To this extent, there is a requirement to notify SafeWork NSW for the friable asbestos removal works and a requirement to engage a Class A Licensed Asbestos Removalist for the removal of this material.

The remainder of asbestos removal/related works at the site must be completed under a separate notification to SafeWork NSW for the bonded ACM removal works, with a Class B Licensed Asbestos Removalist engaged.

With respect to the trace level friable asbestos, there is no requirement to notify SafeWork NSW for removal works and no requirement to engage a Class A Licensed Asbestos Removalist should this material require removal. Management / removal within these areas will require the implementation of asbestos controls such as donning PPE, air monitoring and suppressing dust in accordance with the AMP, Code of Practice SWA 2016a[9] and SWA 2016b[10].

Remediation works shall not commence until all required approvals, licences and notifications have been granted and/or received.

6.2 Site Establishment

The boundary of the extent of remediation will be defined by the Remediation Consultant. The Remediation Contractor (herein referred to as the "Contractor") shall secure these areas to ensure that all safety and environmental controls are implemented. These controls will include, but not be limited to:

- Locate and isolate all required utilities in the proximity of the works;
- Assess need for and implement any necessary traffic controls;
- Work area security fencing;
- Site signage and contact numbers;
- Stabilised site entry gate;
- Appropriate decontamination areas for personnel and plant;
- Sediment fencing (attached to security fencing) where necessary; and

[9] *How to Safely Remove Asbestos - Code of Practice*. NSW Government, Safe Work NSW, 2016 (SWA 2016a)

[10] *How to Manage and Control Asbestos in the Workplace - Code of Practice.* NSW Government Safe Work Australia, 2016 (SWA 2016b);

- Stormwater runoff and sediment controls (e.g. silt fences) where necessary.

6.3 Data Gaps

Existing structures on the site require demolition and removal from the site. The key processes are briefly summarised below:

- Conduct pre-demolition destructive hazardous materials survey;
- Removal and disposal of hazardous materials in accordance with relevant regulatory guidance including WHS Regulations 2017 and Waste Classification Guidelines 2014 (EPA 2014);
- Conduct hazardous materials clearance inspection;
- Demolish remainder of buildings;
- Expose underlying soils for validation sampling by Remediation Consultant; and
- Should validation sampling not meet the adopted site criteria, further remediation of these areas may be required, in order to achieve the remediation objective.

6.4 Remedial Works – Offsite Disposal Option

Where management of asbestos impacted soils will be completed via excavation and off-site disposal, procedures as documented following will require to be implemented to ensure all environmental/health objectives are addressed.

6.4.1 Excavation of Asbestos Impacted Soils

The asbestos impacted soils shall be 'chased' under the direction and supervision of the Remediation Consultant. The procedure for undertaking this excavation activity will be:

- Excavation of impacted soils to lateral and vertical extent (refer to **Section 5.2**), until the soils meet the adopted validation criteria (**Section 8.5**);
- Excavated soils shall be stockpiled on a hardstand or plastic liner pending offsite disposal or loaded directly into the back of a truck for disposal; and
- Any unexpected finds will be managed as per **Section 7**.

6.4.2 Offsite Disposal of Material

Any material requiring disposal shall be classified in accordance with *Waste Classification Guidelines Part 1: Classifying Waste,* NSW EPA (2014) and relevant waste regulations by the Remediation Consultant. Disposal of waste to licensed waste facilities in accordance with relevant waste regulations will be undertaken by the Contractor. All waste tracking documentation including disposal dockets must be maintained by the Contractor and must be provided to the Principal and the Remediation Consultant for inclusion in the validation report. Any asbestos waste exceeding 100 kilograms or more than 10 m^2 of bonded ACM in one load disposed off-site must be tracked using the NSW EPA online system WasteLocate.

6.4.3 Validation

Validation of the remedial works will be conducted by the Remediation Consultant to demonstrate the remediation objectives have been achieved. Details of the validation program are provided in **Section 8**.

6.4.4 Backfilling of excavations and Imported Fill Materials

Upon confirmation of soil validation, excavations will be reinstated using validated material which has been treated onsite, existing on-site materials and/or validated imported fill material where

required. Materials proposed to be imported to the site will be assessed in accordance with **Section 8.5**.

6.5 Remedial Works – Onsite Containment Option

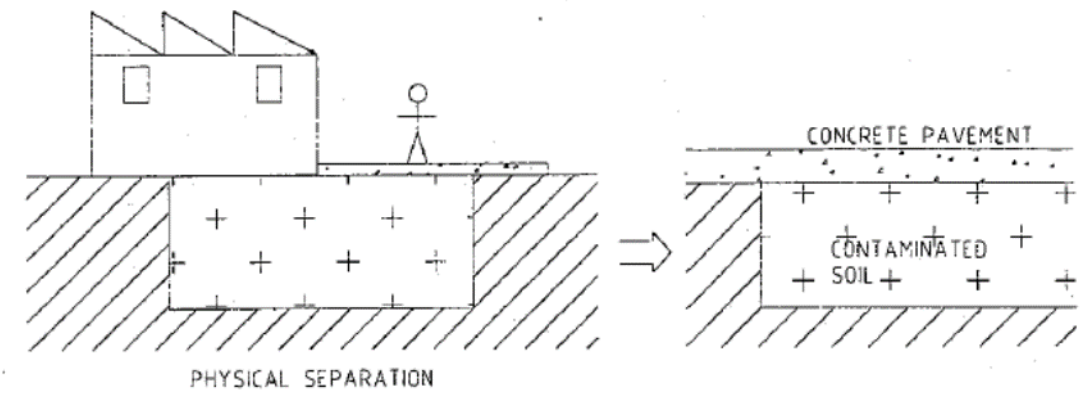
Where management of asbestos impacted soils will be completed via onsite containment beneath future finished levels, procedures as documented following will require to be implemented to ensure all environmental/health objectives are addressed.

6.5.1 Containment Overview

Asbestos impacted fill may be alternatively be managed via containment and the implementation of permanent physical separation or within a "Containment Cell", which eliminates the inhalation exposure pathway for airborne asbestos fibres. The minimum requirements for the physical separation to be adopted in remediation of the site include:

- A minimum soil cover thickness of 0.5 m in landscaped or mass planting/shallow landscaped areas and 1.5 m in tree pit zones which is underlain by a visual "marker layer" in unpaved areas, i.e., parks, gardens and green open spaces etc.; or
- Permanent concrete floor/ground/wall slabs or asphaltic concrete surfaced pavements and underlain by a visual "marker layer", i.e., underlying buildings, roads, pathways; or
- Top (concrete) of pile foundations (no marker layer required for below pile foundations).

A conceptual sketch, sourced from ANZECC 1999[11], is shown following:



The marker layer shall consist of a bright orange coloured non-woven polyester continuous filament or PET (such as nonwoven geotextiles) or similar with a minimum density of approximately 150 grams per square metre (or equivalent). The marker layer must:

- Be easily recognisable within soils (i.e., bright orange in colour);
- Be durable as a long term marker layer (i.e., > 140 grams per square metre); and
- Maintain integrity during remedial/civil works such as capping layer insulation and road/building construction.

Additionally, the marker layer must meet geotechnical and civil specifications where required, i.e., underlying roads.

The specific details of the marker layer are required to be included in the site validation report and LTEMP documents in addition to surveyed plans showing the extent of capped area within the site.

[11] *Guidelines for the Assessment of On-site Containment of Contaminated Soil,* Australian and New Zealand Environment and Conservation Council, September 1999. (ANZECC 1999).

6.5.2 Specific Capping Arrangements

The following capping procedures will be applied to appropriate scenarios across the site, prior to completion of construction works:

- Beneath permanent basement structures – installation of a marker layer over contaminated fill material and permanent concrete slab as the physical barrier.
- Permanent hardstand structures (i.e., concrete slabs, pile caps or asphaltic concrete or similar, but not bricks or pavers) – installation of a marker layer overlying potentially contaminated material followed by sub-grade material validated as environmentally suitable materials for human exposure and then the permanent structure (e.g., exterior concrete footpaths, asphaltic roads, etc.).
- Turfed areas – installation of the marker layer at a minimum depth of 500 mm below final finished site levels, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure.
- Mass planting / shallow landscaping areas – installation of the marker layer at a minimum depth of 500 mm below the final finished site levels, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure.
- New tree pit zones – installation of the marker layer at a minimum depth of 1500 mm below the final finished site levels, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure, noting that the maker layer should extend the depth required for installation of the new tree's existing root ball.
- Existing tree zones – installation of the marker layer consistent with immediately adjacent marker layer depths (e.g., 500 mm in turfed areas and 500 mm in mass planting areas) to the extent practicable, with a capping layer consisting of environmentally suitable materials for potential human and/or ecological exposure.
- Within underground services trenches / services – service infrastructure will require remediation to 150 mm below the depth of services, with a marker layer and capping layer installed consisting of environmentally suitable materials for potential human and/or ecological exposure.
- Within road reserves – the entire width of newly constructed road reserves, in conjunction with service infrastructure will be required to a depth 150 mm below the depth of the services, with a marker layer and capping layer installed consisting of environmentally suitable materials for potential human and/or ecological exposure.

Material above the marker layer extending to the final finished ground level will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate). This may include: virgin excavated natural material (VENM) sourced from on-site, imported VENM, excavated natural material (ENM) or similar material certified in accordance with an exemption issued by the NSW EPA that also meets site suitability criteria; or imported road making materials comprising fresh quarried material or material covered by a beneficial reuse exemption issued by the NSW EPA.

Additionally, material underlying load bearing structures such as roads, should be geo-technically suitable, in accordance previously prepared geo-technical reports.

In the interface of remediated and non-remediated areas, the extent of the marker and capping layer should be extended a minimum of 300 mm laterally outside the extent of remediated area, where practicable. This may include battering of the marker/capping layer to tie-in with existing site levels within the 300mm outside of the remediated area, where practicable.

Validation of the interim and permanent capping arrangements will be required as outlined in **Section 8,** including inspections by the Remediation Consultant, a survey plan prepared by a registered surveyor showing the level and lateral extent of the marker layer, interim capping and permanent capping in relation to the site boundaries.

6.6 Site Disestablishment

On completion of the remediation works all plant/equipment and safety/environmental controls shall be removed from the site by the Contractor. All equipment used during asbestos remediation works will need to be appropriately decontaminated or disposed of as asbestos waste by the Contractor, in accordance with SWA (2016a), EPA (2014) and relevant waste regulations.

7. Contingency Plan

A review of remediation works has been undertaken to identify potential risks to meeting the specified site validation criteria. A number of potential risks have been identified. These are listed following with contingencies that will be implemented to ensure that validation criteria are met.

Additionally, the associated remedial works health and environmental risks/hazards and their minimisation/mitigation are further discussed in **Sections 9.**

7.1 Unexpected Finds Protocol

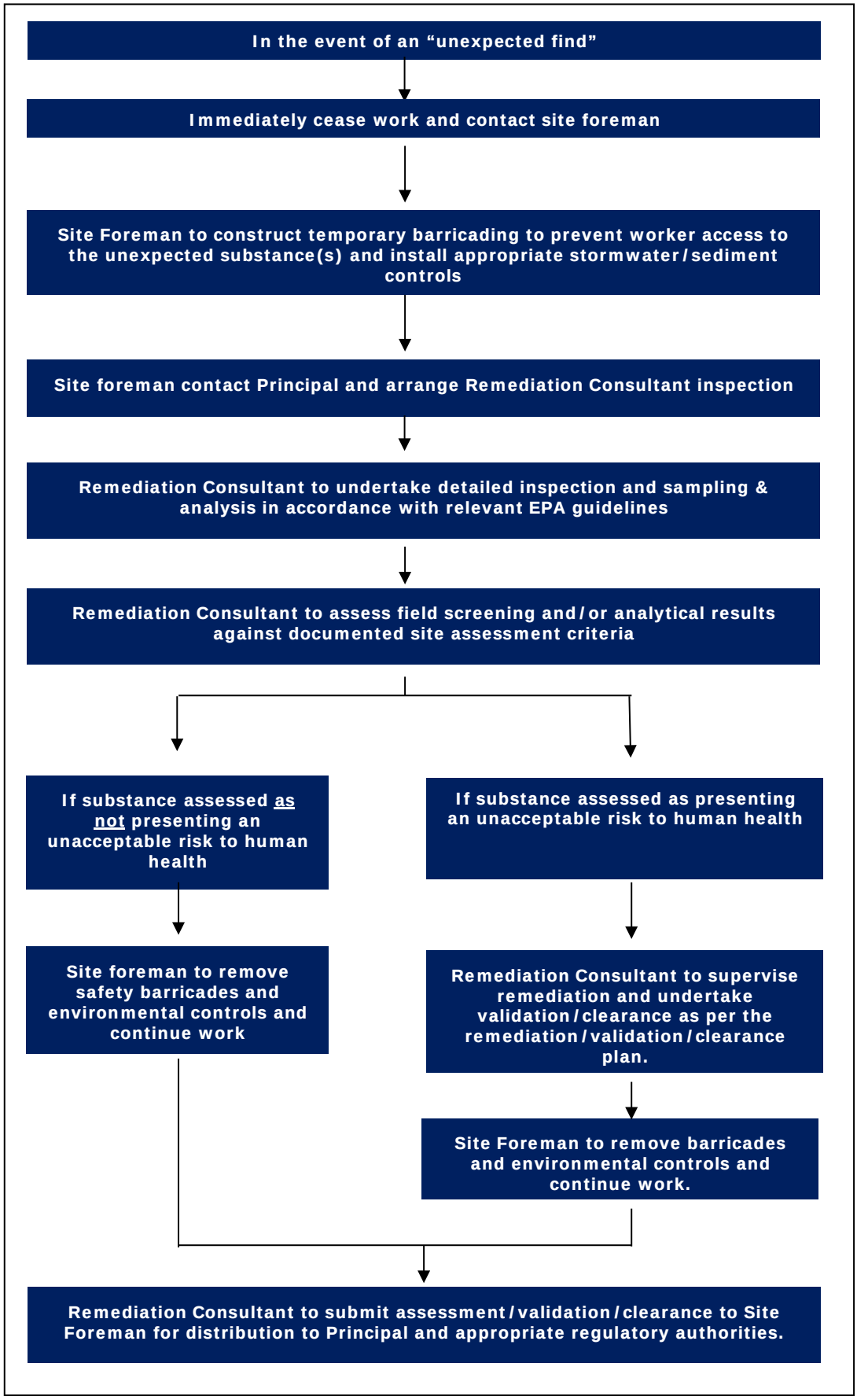
It is acknowledged that previous investigations of the site have been undertaken to assess the identified contaminants of potential concern in selected parts of the site. However, ground conditions between sampling points may vary, and further hazards may arise from unexpected sources and/or in unexpected locations during remediation. The nature of any residual hazards which may be present at the site are generally detectable through visual or olfactory means, for example:

- >10 m^2 of ACM fragments encountered in one location (visible) outside the extent of known asbestos impacted fill materials (TP257);
- Friable ACM such as lagging (visible) encountered;
- Drums of soil/chemicals/waste;
- Petroleum infrastructure;
- bottles/containers of chemicals (visible); and
- ash and/or slag contaminated soils/fill materials (visible).

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances be identified (or any other unexpected potentially hazardous substance), the procedure summarised in **Flowchart 7.1** is to be followed.

An enlarged version of the unexpected finds protocol, suitable for use onsite, should be posted in the Site Office and referred to during the site-specific induction by the Contractor.

Flowchart 7.1: Unexpected Finds Protocol



7.2 Contingency Scenarios

7.2.1 Remedial Strategy Constraints

In the event that the proposed remedial works do not meet the validation criteria, or if the selected remedial strategy is not able to proceed, the following actions will be considered to ensure, firstly, the safety and health of people and the environment and, secondly, that the overall project objectives are achieved:

- Reassessment of remedial and validation options for asbestos impacted materials; and
- Continued controlled excavation/sorting of impacted soils; or
- Containment of impacted materials onsite and development and implementation of a suitable Long Term Asbestos Management Plan (LTAMP) to manage any residual asbestos contamination (if appropriate).

7.2.2 Material Storage Breach

In the event any stockpiled materials escape (or have the potential to escape), then the management controls shall be rectified and investigations undertaken to review the adequacy of the controls and any improvements implemented.

7.2.3 Complaints

Due to the nature of the activities and type of contaminants identified at the site there is a potential for complaints to be received from members of the public relating to environmental emissions including:

- Dust emissions arising from soil excavation, material handling and transport; and
- Noise and vibration from excavation.

Monitoring of all environmental emissions shall be undertaken as detailed in **Section 9** and appropriate actions taken to further control emissions following receipt of a complaint. Such additional controls may include the following actions:

- Disturbance of soils during meteorologically favourable periods only; and/or
- Increasing environmental controls including covering and/or wetting down soils which are generating dust.

7.2.4 Severe Weather

Weather will be monitored on a daily basis via checking an internet based weather service provider. Should severe weather be forecast, especially strong winds, works will stop until safe to re-commence. All site management controls will be implemented to the extent practicable as outlined in **Section 9** prior to any severe weather events.

8. Validation Plan

8.1 Overview

Validation data is required to be collected to verify the effectiveness of the remediation works and document the condition of the site as being suitable for the permissible land uses. Validation activities will be required for the following:

- Excavations formed by removal of bonded ACM impacted material;
- Excavations formed by removal of friable asbestos impacted material;
- Waste materials requiring offsite disposal;
- Residual soils underneath stockpiles where contaminated material has been stored;
- Confirmation the site surface (0 – 100 mm) does not contain visually identifiable asbestos or other unacceptable aesthetic issues; and
- Importation of materials to site (if required).

8.2 Data Quality Objectives

Data Quality Objectives (DQOs) were developed for the validation program, as discussed in the following sections.

8.2.1 State the Problem

The site contains bonded ACM and friable asbestos impacted fill material that require remediation for the site to be considered suitable for future proposed land uses.

To appropriately demonstrate that the remedial works have been completed in accordance with this RAP, sufficient data in the form of observations, sample analytical data, material tracking records, etc. are required to be collected and assessed in a defensible manner.

8.2.2 Identify the Decision

The following decisions are required to be made during the validation works:

- Are there any unacceptable risks to onsite or offsite receptors following the remediation of impacted soil?
- Have all aesthetic issues been addressed?
- Have excavated/sorted materials classified and disposed of offsite to a facility licensed to accept the classified waste?
- Was imported material used as backfill suitable for the intended land use?
- Is there any potential migration of contaminants from the site?
- Have the works been completed in accordance with the RAP, or where variations to the works were required, have these met the objectives of the RAP?
- Is the site suitable for the proposed land uses?

8.2.3 Identify Inputs to the Decision

The inputs to the decision are:

- Previous investigation data;
- Field observations, sampling and analytical data during remedial works;
- Field observations, sampling and analytical data for offsite disposal of waste materials;

- Documentation of appropriate classification of imported materials (if required);
- Assessment criteria for soils; and
- Data quality indicators as assessed by quality assurance/quality control procedures (QA/QC).

8.2.4 Define the Study Boundaries

The study boundaries of the site are defined as follows:

- The approximate lateral extent of the works relevant to this RAP is shown on **Figures 4**; and
- The vertical extent of the works varies between the remedial areas as discussed in **Section 4.1**.

Ultimately the study boundaries will comprise the lateral and vertical extent of the site successfully validated in accordance with the requirements of this plan. The temporal limits of the assessment will comprise the duration of the remedial works and validation programs.

8.2.5 Decision Rules

The decision rules adopted to answer the decisions identified in **Table 8.1** below.

Table 8.1: Decision Rules

Decision Required to be Made	Decision Rule
1. Are there any unacceptable risks to onsite or offsite receptors from any residual soil contamination?	Soil analytical data will be compared EPA endorsed criteria. Statistical analyses of the data in accordance with relevant guidance documents will be undertaken, if appropriate, to facilitate the decisions. The following statistical criteria will be adopted with respect to soils: Either: the reported concentrations are all below the site criteria; Or: the average site concentration for each analyte must be below the adopted site criterion; no single analyte concentration exceeds 250% of the adopted site criterion; and the standard deviation of the results must be less than 50% of the site criteria. And: the 95% upper confidence limit (UCL) of the average concentration for each analyte must be below the adopted site criterion. If the statistical criteria stated above are satisfied, the decision is **No**. If the statistical criteria are not satisfied, the decision is **Yes**. Note: it is not appropriate to apply 95% UCL to asbestos validation samples.
2. Are there any aesthetic issues remaining following remediation works?	If there were any remaining unacceptable aesthetic impacts including , the answer to the decision will be **Yes**. Otherwise, the answer to the decision will be **No**.
3. Was excess excavated soil classified and disposed of offsite to a facility licensed to accept the classified waste?	Soil analytical data will be compared against EPA Waste Classification Guidelines (2014). Statistical analyses of the data in accordance with relevant guidance documents will be undertaken, if appropriate, to facilitate the decisions (as detailed above). Appropriate waste classification and disposal documents to be obtained. If the statistical criteria stated above are satisfied, the decision is **Yes**, and if receipts are provided recording the disposal of material to an offsite licensed facility, the decision is **Yes**. If criteria or statistical assessment are not satisfied, or no disposal receipts are provided, the answer is **No**.
4. Was imported material used as backfill suitable for the intended land use?	Material required to be imported onto the site as capping, trench backfill or road building purposes (or any other purpose) are required to be demonstrated to be Virgin Excavated Natural Material (VENM), Excavated Natural Materials (ENM) or material considered suitable for beneficial reuse in accordance with a resource recovery exemption issued by NSW EPA under clauses 51 and 51A of the Protection of the Environment Operations (Waste) Regulation 2014. All imported material must not be classified as containing asbestos. All imported materials will be assessed to ensure the entirety of the capping layer from surface to the marker layer is validated upon conclusion of remedial works.

Decision Required to be Made	Decision Rule
	VENM Laboratory analysis results will be compared to published background levels (metals) and nominated laboratory LORs (for all man-made chemical constituents) for VENM. The Remediation Consultant will conduct a site inspection of all VENM source sites and approve any VENM Certificates prior to importation of material. If either the source site or supporting documentation is unsatisfactory in regards to certainty of the material comprising VENM, the Remediation Consultant will undertake additional sampling to confirm chemical characterisation of VENM material and prepare any required documentation. ENM ENM will be assessed in accordance with the "Excavated Natural Material Exemption 2014". The Remediation Consultant will conduct a site inspection of all ENM source sites and approve any ENM material characterisations prior to importation of material. If either the source site or supporting documentation is unsatisfactory in regards to certainty of the material comprising ENM, the Remediation Consultant will undertake additional sampling to confirm chemical characterisation of ENM material and prepare any required documentation. Resource Recovery Exemptions Any materials falling under this category will be assessed in accordance with the relevant resource recovery exemption. The Remediation Consultant will undertake additional assessment and reporting if required to ensure compliance with the relevant resource recovery exemption.
5. Is there any potential migration of contaminants from the site?	Should concentrations of contaminants remain at the site following validation, which could pose an unacceptable risk from migration (or should off-site sources pose a potentially unacceptable risk to the site), the answer is **Yes**, and further investigation or management may be required. Otherwise the answer is **No**.
6. Have all remediation works been completed in accordance with the requirements of the RAP, or where variations were required, have these been appropriate to meed the RAP objectives?	Evaluation of the RAP requirements and completed scope of works will be completed on a qualitative basis. If the completed works are inconsistent with the RAP objectives, the answer will be **No**. In this instance, evaluation of the works will be undertaken with consideration to the RAP objectives. If the works are inconsistent with the stated objectives, the answer is **No**. Otherwise the answer to the decision is **Yes**.
7. Is the site suitable for the permissible uses?	If there are no potentially unacceptable risks to human health and the environment remaining onsite, then the answer is **Yes**. Otherwise the answer is **No**.

8.2.6 Specify Limits of Decision Error

This step seeks to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting inherent uncertainty in the data. Data generated during this project needs to robust and reliable to facilitate decisions to be made with confidence.

Specific limits for this project were adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), appropriate indicators of data quality indicators (DQIs) used to assess QA/QC and standard JBS&G procedures for field sampling and handling.

To assess the useability of the data prior to making decisions, the data were assessed against pre-determined DQIs to assess precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters). The acceptable limit on decision error was 95% compliance with DQIs.

The QA/QC program is documented in **Table 8.2**.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples for chemical COPCs. For asbestos

precision is assessed by whether the identification results for duplicate samples were in agreement with the original sample.

- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards. Note only applied to chemical COPC.
- **Representativeness** –expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; and ensuring analysing laboratories use consistent analysis techniques; and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 8.2 Summary of Data Quality Indicators for Soil Validation Program

Data Quality Indicators	Frequency	Data Quality Criteria
Precision		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD[1], agreement for asbestos
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD[1], agreement for asbestos
Laboratory Duplicates	1 / 20 samples	<50% RPD[1]
Accuracy		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	70-130%
Matrix spikes	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes	All samples	-[2]
Samples extracted and analysed within holding times.	All samples	Soil: organics (14 days), inorganics (6 months) Metals (6 months)
Laboratory Blanks	1 per lab batch	<LOR
Trip spike	1 per lab batch	70-130% recovery
Storage blank	1 per lab batch	<LOR
Rinsate sample	1 per sampling event/media	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All Samples
Standard analytical methods used for all analyses	All Samples extracted and analysed within holding times	NATA accreditation
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples[2]
Limits of reporting appropriate and consistent	All Samples extracted and analysed within holding times	All samples[2]
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples[2]
Appropriate documentation	All Samples	All samples[2]
Satisfactory frequency and result for QC samples		95% compliance
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All samples	LOR<= Site assessment criteria

[1] If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

[2] A qualitative assessment of compliance with standard procedures and appropriate sample collection methods will be completed during the DQI compliance assessment.

8.2.7 Optimise the Design for Obtaining Data

The purpose of this step is to identify a resource-effective field investigation sampling design that generates data that are expected to satisfy the performance criteria, as specified in the preceding steps of the DQO Process.

For these works, after the removal of asbestos impacted materials, the resultant excavation walls/base/stockpile footprint will be inspected/sampled in accordance with **Table 8.3** with the results assessed against the validation criteria in **Section 8.5**.

Following the removal of extraneous anthropogenic materials from the soil profile, remediated soils will be inspected for the presence of extraneous anthropogenic materials (and glass), as per **Table 8.3** and the validation criteria in **Section 8.5**.

Imported materials (where/if required) will also require validation to ensure their appropriateness (from a contamination perspective) for use on the site in accordance with the NEPC (2013) guidelines or relevant exemptions (such as VENM and ENM). Sample densities are outlined in **Table 8.3**. The validation criteria are discussed in **Section 8.5.3**.

Materials requiring offsite disposal are required to be classified in accordance with EPA (2014) Waste Classification Guidelines. Sample densities are outlined in **Table 8.3**.

Table 8.3: Validation Analytical Schedule

Item	Sampling Frequency			Analytes
	Excavation Base	Excavation Walls	Materials	
Excavation formed by the removal asbestos impacted soils	1 sample / 25 m^2 (5 m grid)	1 sample / 5 linear metres; and 1 sample / 1 m depth	N/A	Field asbestos quantification and Asbestos (500 mL)
Stockpile footprints	1/100 m^2 (10 m grid) with a minimum of 2 samples	N/A	N/A	Field asbestos quantification and Asbestos (500 mL)
Data gaps below existing buildings and structures	1 / 400 m^2 (20 m grid)	N/A	N/A	Heavy Metals TRH/BTEX OCPs/PCBs PAHs Asbestos (500mL)
Waste classification of materials requiring offsite disposal	N/A	N/A	1/100 m^3 with a minimum of 3 samples	Heavy Metals TRH/BTEX OCPs/PCBs PAHs Asbestos (500mL)
Imported Materials of VENM, if required	N/A	N/A	Minimum 5 samples per source site. Maximum of 10 samples.	<u>As a minimum:</u> Heavy metals TRH/BTEX PAHs OCPs/PCBs Asbestos (500mL)
Imported Materials of ENM, if required	N/A	N/A	As per ENM Order.	Heavy metals TPH/BTEX PAHs pH

Item	Sampling Frequency			Analytes
	Excavation Base	Excavation Walls	Materials	
				EC RTA 276 (foreign materials) Asbestos (500mL)
Recycled/Recovered Products	N/A	N/A	As per relevant exemption	As per exemption plus Asbestos (500mL)

8.3 Validation Methodology

The soil sampling method shall be determined by the Remedial Consultant as consistent with the observations and appropriate to generate representative samples. The soil sampling method shall be consistent with the data quality indicators in **Section 8.2.6**.

8.3.1 Bonded and Friable Asbestos Impact Remedial Excavations

The validation program for bonded asbestos contaminated fill excavations is:

- Inspection of representative samples of the excavation base and walls, obtained by an excavator bucket, by a suitably trained and experienced person. If any ACM or friable asbestos is observed, the excavation will be extended and the affected excavation surface re-inspected until such time as visual validation (limited prevalence of ACM) is obtained.
- Asbestos validation sampling samples will be conducted at the rate in **Table 8.3** for asbestos quantification and laboratory analyses.
- The AQ samples will comprise a volume of fill material no less than 50 litres. The sampled material shall be spread on plastic and raked. All ACM within the AQ sample shall be recovered, bagged and weighed. The volume of the fill material within the AQ sample shall be calculated based on the dimensions of the sampled area within the excavation wall. The mass of fill will be calculated using a conservative soil density of 1.63 g/cm^3 (from US EPA 2003[12]) as adopted from JBS&G 2018.
- The mass of recovered ACM and the mass of fill material within the sample will be used to calculate the concentration of ACM within the AQ sample which is representative of that wall or base.
- A 500 mL soil sample will be collected for laboratory analysis from within the AQ sample to confirm that AF/FA are below the adopted validation criteria.
- If the concentration of ACM within an AQ sample is calculated to be above the adopted criterion, or if AF/FA is detected above the adopted criterion, the excavation will be extended in the direction of the failed wall or base, and the validation process repeated.
- Alternatively, where the concentration of ACM and AF/FA (laboratory) is calculated below the adopted criteria for all walls and the base, the excavation will be deemed to have been successfully validated.

8.3.2 Footprint of Contaminated Stockpiles

The validation program for the footprint of asbestos contaminated stockpiles is:

[12] *User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings.* US EPA Office of Emergency and Remedial Response, June 19 2003 (US EPA 2003)

- Inspection of the stockpile footprint by a suitably trained and experienced person. If bonded ACM is identified, surface soils are required to be emu-picked (to depth of 100 mm) or scraped (100 mm), and the footprint re-inspected until such time as visual validation is obtained;
- Following visual validation, soil samples will be collected from the footprint on a 10 m grid, and analysed in accordance with **Table 8.3**; and
- If asbestos is identified in a validation sample at concentrations above the site validation criteria, the soil represented by the failed validation sample will be scraped and disposed offsite (or capped onsite), and the validation inspection and sampling process repeated for the failed area. Alternatively, where asbestos is not identified in the samples by laboratory analysis, the footprint will be deemed to have been successfully validated.

8.3.3 Ground Surface Validation (Aesthetics)

Prior to the completion of remedial works, the ground surface of the site shall be thoroughly inspected by the remediation consultant to confirm the absence of visual ACM. Should any observable ACM be identified, the area should be emu-picked or capped with 100 mm of environmentally validated soil prior to re-inspection by the remediation consultant.

8.3.4 Imported Materials

Fill materials imported on site are required to be either VENM, ENM or any other suitable material. Imported materials will require validation prior to being imported to site.

Imported material source sites will be visited by the remediation consultant. Supporting documentation must be provided by the Contractor for imported materials to be assessed against the validation plan, relevant guidelines/exemptions and adopted site criteria. The Remediation Consultant will collect additional samples and prepare appropriate documentation for imported materials in lieu of adequate information provided by the Contractor to ensure all material imported to site is validated.

Validation sampling will be undertaken in accordance with **Table 8.3**.

8.3.5 Data Gap Sampling Under Buildings and Structures

Soil validation sampling for asbestos and chemical constituents will be conducted by the Remediation Consultant under structures or slabs where data gaps remain. An approximate 20 m grid sampling density will be applied, with sample locations targeting identified areas of concern. The sample locations will comprise both chemical constituent sampling and asbestos quantification sampling as outlined in **Table 8.3**. All results will be compared to the adopted site soil validation criteria.

8.3.6 Validation of Onsite Containment

Marker Layer

Visual inspection will be undertaken by the Remediation Consultant to verify the installation of the marker layer across required areas. Photographic records and a survey prepared by a Registered Surveyor of the marker layer installation, including vertical and lateral extents by the Contractor will be retained for inclusion in the validation report.

Capping Layer

Material to be used as a capping layer must be validated by the Remediation Consultant to be environmentally suitable, consisting of VENM, ENM, suitable on-site materials (i.e. VENM from southern portion of the site) or material considered suitable for beneficial reuse via a resource recovery exemption issued by NSW EPA. Additionally, contaminant concentrations in any capping layer material must not exceed the adopted site validation criteria for soils.

The capping layer must be placed at the thicknesses specified for each capping scenario as detailed in **Section 6.5.** Photographic records and a survey of the capping layer installation, which details the final thicknesses of the capping layer, including the vertical and lateral extents prepared by the Contractor will be retained for inclusion in the validation report.

Surveys

The remedial contractor must provide a survey of the marker layer and capping layer that demonstrates the lateral and vertical extents each layer. The capping layer survey must demonstrate that the minimum capping thicknesses (as per **Section 6.5**) have been achieved.

8.4 Laboratory Analysis

NATA accredited laboratories shall be used for all analysis of samples. Appropriate methods and limits of reporting (LORs) are required for comparison to relevant criteria.

8.5 Soil Validation Criteria

8.5.1 Assessment Criteria Selection

As per the decision process for assessment of urban development sites (EPA 2017), a set of health and ecological assessment thresholds derived from NEPC (2013) or other EPA endorsed guidelines was used for evaluation of site contamination data collected for this assessment.

The hospital land use represents a scenario that does not fall under the standard health investigation land use scenarios presented in NEPM (2013). Schedule B7 of NEPM (2013) states "the HILs developed for the commercial/industrial land use scenario are not applicable to a site used frequently by more sensitive groups such as children (within childcare centres, hospitals and hotels) and the elderly (within hospitals, aged care facilities and hospices)." Given that sensitive sub-populations (such as patients with immunosuppression and pre-existing illness) are frequent users of the site, it is considered that a more sensitive land use scenario should be adopted.

To this extent, the HIL B – standard residential land use scenario with minimal opportunities for soil access has been adopted as the site validation criteria for the Stage 1 Towers area. No remediation is proposed within the childcare centre portion of the site.

8.5.2 Soil Validation Criteria

The site validation criteria for the Stage 1 Tower are presented on **Tables A** and **B** and summarised as follows:

- Health based investigation levels (HILs) for residential with minimal opportunities for soil access (HIL B);
- Health Screening Levels (HSLs) for petroleum hydrocarbons considering potential for vapour intrusion within fine grained soils for low-high density residential land use (HSL A & HSL B);
- Management limits for TRH fractions for Residential, Parkland and Public Open Space, land use, fine soils;
- HSLs for asbestos in soil for residential with minimal opportunities for soil access land use (HSL B); and
- Ecological Investigation/Screening Levels (EILs/ESLs) for urban residential land use.

The adopted HSLs for petroleum hydrocarbons will be dependent upon the depth of validation samples relative to the proposed final site levels. As a conservative approach, the most conservative HSL for each petroleum COPC will be adopted as an initial screening tool.

EILs were calculated via the summing of ambient background concentrations (ABC) and added contaminant limits (ACL), based on soil characteristics of the site. ABCs were based on Olszowy et al (1995)[13].

Where no criteria are present for a contaminant, the laboratory limit of reporting (LOR) will be used as an initial screening criteria.

8.5.3 Application of Soil Assessment Criteria

For soils to be considered as meeting the adopted validation criteria (i.e., not posing an unacceptable risk), the following criteria will be adopted:

- Either:
  - All contaminant concentrations will be less than the adopted site assessment criteria,
- Or:
  - The upper 95% confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) is below the adopted criterion;
  - No single analyte concentration exceeded 250% of the adopted criterion; and
  - The standard deviation of the results is less than 50% of the criterion.

It is not proposed to apply 95% UCLs to asbestos validation samples. Rather the adopted site criteria and multiple lines of evidence will be used for asbestos validation works.

8.6 Waste Disposal Off-site

All wastes requiring off-site disposal must be classified in accordance with *Waste Classification Guidelines* (EPA 2014). The Contractor is responsible for the lawful disposal of the classified waste to a licensed waste disposal facility lawfully able to accept the waste.

Disposal dockets for each individual off-site waste disposal load must be provided to the Principal and to the Remediation Consultant by the Contractor to demonstrate appropriate off-site disposal of waste occurred for site validation purposes.

8.7 Material Tracking Plan

The movement of all earth/aggregate based materials on the site, to the site and from the site is required to be subject to a Material Tracking Plan (MTP). The MTP shall be administered by the Remediation Consultant with the provision of all required information by the Contractor.

Material tracking shall be required for all materials that are moved / excavated from a location on the site and not wholly replaced in the same locations within 12 hours of material movement (i.e., soils excavated for testpitting / assessment do not require material tracking, however all other material will require tracking).

8.8 Material Tracking Data

To this extent, all excavation and filling works as undertaken for the purposes of site remediation require the following information to be recorded by the Contractor on Material Tracking Forms (MTFs) and in an electronic Material Tracking Spreadsheet (MTS) and verified by the Remediation Consultant, with respect to material placement activities:

- Date (yyyy/mm/dd);

[13] *Trace element concentrations in soils from rural and urban areas of Australia*, H Olszowy, P Torr, P Imray, Department of Human Services and Health, Environmental Protection Agency, published 1995 (Olszowy *et* al. 1995)

- Unique MTF identification (starting at 001);
- Site figure showing source (cut) and placement (fill);
- Estimated volume (cubic metres);
- Type of material (refer to classification scheme in **Section 9.6.2**);
- Depth of source (RL)
- Depth of placement (RL);
- Source (from) information in terms of MGA56 co-ordinates as established by site GPS and/or survey;
- Placement (to) information in terms of MGA56 co-ordinates as established by site GPS and/or survey;
- Source (from) information in terms of site feature (e.g. Remedial Zone);
- Placement (to) information in terms of site feature (e.g. Remedial Zone);
- Source (from) information from off-site source site (e.g., Quarry A);
- Placement (to) information for off-site disposal (e.g., tip, EPA tracking number, docket reference);
- Reference document (where necessary, i.e. virgin excavated natural material / excavated natural material classification);
- Purpose of placement (i.e. containment, surplus to site requirements etc); and
- Comments (when required).

For material which has been removed for the purposes of environmental remediation, and is proposed to be moved again subsequent to the completion / validation of environmental remediation works, MTFs for the replacement of the material shall make reference to the initial MTFs generated by the excavation of the materials for remediation. As part of the validation of the material tracking forms, mass / material balances shall be assessed at each stage where additional material tracking forms are generated for particular site material.

It is the responsibility of the Contractor to ensure the MTF(s) are completed and submitted to the Remediation Consultant at the end of each day's work. The Remediation Consultant has ownership of the MTFs on receipt of all the necessary information from the Contractor.

The Remediation Consultant is required to review the submitted MTFs and to investigate/resolve any discrepancies. Following this review, a copy of the MTFs will be forwarded to the Principal. Ideally this would occur within two days of the Remediation Consultant verifying the MTFs from the Contractor.

The MTP is considered an active process and revisions of the MTP will be undertaken to improve the MTFs and MTS to ensure comprehensive and efficient material tracking.

8.9 Reporting

8.9.1 Validation Report

At the completion of remediation works, a validation report will be prepared in general accordance with EPA (2017) and OEH (2011) *Guidelines for Consultants Reporting on Contaminated Site*, documenting the works as completed.

This report will contain information including:

- Details of the remediation works conducted;

- Information demonstrating that the objectives of this RAP have been achieved, in particular the validation sample results and assessment of the data against both the pre-defined DQO and the remediation acceptance (validation) criteria;
- Information demonstrating compliance with appropriate regulations and guidelines;
- Any variations to the strategy undertaken during the implementation of the remedial works;
- Results of all environmental monitoring undertaken during the course of the remedial works;
- Details of any environmental incidents occurring during the course of the remedial works and the actions undertaken in response to these incidents;
- Verification of regulatory compliance;
- Details on waste classification, tracking and off-site disposal including landfill dockets; and
- Clear statement of the suitability of the site with respect to permissible land uses.

The report will serve to document the remediation works for future reference.

8.9.2 Long Term Asbestos Management Plan

Should the remediation result in on-site containment of asbestos impacted fill materials, a Long Term Asbestos Management Plan (LTAMP) will be required. The LTAMP will document provisions for the f long-term management of the marker and capping layers integrity and detail the required controls for future works below the marker layer.

9. Site Management Plan

9.1 Overview

Additional management controls in any development consent will need to be met, together with general requirements of Council's applicable Development Control Plans (DCPs).

9.2 Hours of Operation

All remediation works shall be conducted within the following hours or as specified on the development consent:

- Monday to Friday: 7am to 6pm.
- Saturday: 8am to 1pm.
- Sunday and public holidays: No work permitted.

9.3 Erosion and Sediment Control Policy

All works shall be conducted in general accordance with Soils and Construction Managing Urban Stormwater Standards (Landcom 2004), which outlines the general requirements for the preparation of a soil and water management plan.

9.4 Stockpile Management

All materials stockpiled onsite will be managed by the Contractor. Unique numbers will be provided for each stockpile, the source of the stockpile, its estimated volume, material characterisation and its location onsite will also be recorded.

The following general procedures will be implemented by the Contractor:

- No stockpiles of soil or other materials shall be placed on footpaths or road reserves unless prior Council approval has been obtained; and
- All stockpiles of soil or other materials shall be placed away from drainage lines, gutters or stormwater pits or inlets.

9.4.1 Temporary Management

Any temporary stockpiles must be kept damp (not flooded) and covered by geo-fabric/plastic or sealed with a soil binding product as soon as practical. Where weather conditions are appropriate (cool/cold weather, minimal wind and/or precipitation), temporary stockpiles may be kept moist as a temporary control measure. The control measure will extend beyond the perimeter of the stockpiles and shall be secured to prevent being blown away by wind. Stockpiles must be placed in a secured, signed and excluded location onsite.

9.4.2 Long Term Management

Long term stockpiles must be covered with geo-fabric or sealed with a soil binding product (dust-bloc) or sealed with hydro mulch. Large stockpiles should be bunded to prevent asbestos impacted water runoff.

Regular inspections of long term stockpiles should be undertaken to ensure the controls implemented are in good condition, no dust is being generated from the stockpile and no runoff is occurring.

When the seal is broken on long term stockpiles, such as moving, excavation or tracking over the stockpile, the interim management measures must be implemented until such a time that the long term controls can be re-implemented on the stockpile.

9.5 Site Access

All vehicle access to the site shall be stabilised to prevent the tracking of sediment onto the roads and footpaths. All materials must be removed from the roadway on a daily or as required basis.

9.6 Excavation Pump-out

It is unlikely that any remedial excavation pump-out will be required given the limited excavation requirements.

9.7 Landscaping / Rehabilitation

All exposed soils shall be progressively stabilised and revegetated consistent with surrounding areas. Any imported soils should be filled only to a level consistent with the previously removed soils (if required).

9.8 Noise

Remediation work shall not give rise to 'offensive noise' as defined in the *Protection of the Environment Operations* (POEO) Act 1997. All equipment and machinery associated with the remediation work shall be operated by the Contractor in accordance with the *POEO Act* (*1997*) and its *Noise Control Regulations 2000*.

Noise generated should be managed so as not to adversely impact the amenity or residents/business adjoining or nearby the site.

All machinery and equipment used on site will be in good working order and fitted with appropriate silencers when necessary.

9.9 Vibration

Vibration generated should be managed so as not to adversely impact the amenity or residents/business adjoining or nearby the site.

9.10 Dust Control

During the remedial works, as necessary, excavation areas will be wetted down using a water spray to minimise the potential for dust to be generated by the Contractor. A wetting or bonding agent may be used to further bind the soil to minimise asbestos fibre release.

All asbestos impacted soils must be wetted (but not flooded) prior to and during excavation and movement of the soils. To control dust in significant areas of exposed asbestos contaminated fill, industrial misting fans, placed at the outer extents of remedial/excavation areas, must be utilised by the Contractor.

Dust shall also be controlled by ensuring vehicles leave via the designated (stabilised) site access and all equipment have dust suppressors fitted by the Contractor.

Where significant fugitive emissions are observed from asbestos inspection / treatment pads, or bioremediation areas, these areas shall be wetted and/or covered by the Contractor.

Meteorological conditions will be monitored by the Remediation Consultant and Contractor. Remedial work will be stopped or modified where meteorological conditions are adverse (i.e., dry conditions and strong winds towards sensitive receptors).

Plant and vehicles should limit their speed when working within asbestos exclusion zones and only traverse wetted haul roads. Only essential vehicles are permitted to traverse the asbestos exclusion zone.

9.11 Air Quality

9.11.1 Airborne Asbestos Fibre Monitoring

Airborne asbestos fibre monitoring will be conducted in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC*) Asbestos Code of Practice and Guidance Notes*, in particular the Guidance note for the estimation of airborne asbestos dust [NOHSC 3002:2005]. The consultant shall undertake airborne asbestos fibres monitoring at a minimum of five static locations daily during remediation works that will disturb asbestos impacted or contaminated materials. Monitoring locations will include site perimeter locations and downwind locations. Wind Rose information available from the Bureau of Meteorology (BOM) for the nearest weather stations will be used to determine common prevailing winds in the area.

Air filters shall be analysed by a NATA accredited laboratory and results shall be required to be below 0.01 fibres/mL. All detections of fibres shall be further analysed by scanning electron microscope (SEM) to confirm the fibres are asbestos.

If respirable asbestos fibres are confirmed and present between 0.01 and 0.02 fibres/mL, the following controls must be implemented by the licensed asbestos removalist, in accordance with SWA 2016a;

- Review control measures;
- Investigate the cause; and
- Implement controls to eliminate or minimise exposure and prevent further release.

If respirable asbestos fibres are confirmed and present above 0.02 fibres/mL, the following controls must be implemented by the licensed asbestos removalist, in accordance with SWA 2016a;

- Stop removal work;
- Notify SafeWork NSW by phone, then by fax or written statement that work has ceased;
- Investigate the cause;
- Implement controls to eliminate or minimise exposure and prevent further release; and
- Do not recommence removal work until further air monitoring is conducted and fibre levels are detected below 0.01 fibres/mL.

A daily report air monitoring report will be prepared documenting the previous/same days airborne asbestos fibre air monitoring results. This report will be made available to all relevant stakeholders.

9.11.2 Dust Monitoring

Preference is given for all environmental monitoring to be undertaken using real time methods. To this extent, the Remediation Consultant shall monitor potentially dust generating remedial works on the site by the use of a dust-trak real-time aerosol monitor. A minimum of five locations will be monitored twice daily (AM and PM) for ten minutes per location. It is only proposed to conduct real-time dust monitoring during contaminated soil remedial works (i.e., excavation and disposal of TP247 and TP259).

The consultant will advise the Principal and Contractor when the time averaged dust-trak particulate measurement exceeds 0.05 mg/m^3. WA DoH (2009) reports that this level is protective of potential asbestos fibre exposures. Further, this level is well below the inspirable dust inhalation standard, and is further protective of potential respirable dust impacts at the site boundary. The remediation works shall not comprise excavation / handling of silica rich materials, and maintenance of particulates at this level is considered to be similarly protective of potential silica exposures.

If dust levels exceed the adopted criteria of 0.05 mg/m^3, the Principal and Contractor will be notified, and works will require to be modified to reduce dust emissions to below the adopted criteria. All exceedances will be required to be "closed-out" by re-sampling at the exceedance location subsequent to implementation of modified work routines (such as increased dust controls).

9.12 Transport of Material Offsite

Trucks will be loaded in designated areas. The Contractor shall ensure that there is no material tracked out onto the street and that the load is securely covered. In addition, all site vehicles must leave the site in a forward direction.

The Contractor shall also log truck movements and approximate volume, via registration number and consignment number (where applicable), into and out of the site. Truck load details will be included as part of the Validation Report.

All appropriate road rules shall be observed and state roads will be selected as far as practicable over local roads when deciding on the transport route to the off-site material disposal location.

Plant and vehicles should limit their speed when working within asbestos exclusion zones and only traverse designated paths.

9.13 Hazardous Materials

Hazardous and/or intractable wastes arising from the remediation work shall be removed and disposed of in accordance with the requirements of NSW EPA, SafeWork NSW and the relevant regulations by the Contractor.

In particular, any hazardous wastes will be transported by a NSW EPA licensed transporter.

9.14 Disposal of Contaminated Soil

All soils will be classified, managed and disposed in accordance with the *Waste Classification Guidelines* (EPA 2014). Documentary evidence for all soil disposal shall be kept for inclusion in the Validation Report.

Trucks will be loaded in designated areas. The Contractor shall ensure that there is no material tracked out onto the street and that the load is securely covered. In addition, all site vehicles must leave the site in a forward direction.

The Contractor shall also log truck movements and approximate volume, via registration number and consignment number (where applicable), into and out of the site.

All appropriate road rules shall be observed and state roads will be selected as far as practicable over local roads when deciding on the transport route to the off-site material disposal location.

Plant and vehicles should limit their speed when working within asbestos exclusion zones and only traverse designated paths.

WasteLocate is now operational within NSW and any loads of asbestos waste that trigger the values of WasteLocate must be tracked via the online system.

Additional requirements for offsite disposal of soils are presented in **Section 8**.

9.15 Groundwater

It is anticipated no dewatering will be required for the remediation works. If dewatering is required as part of the remediation works, a licence shall be applied for from the Office of Water for approval to extract groundwater.

9.16 Site Signage and Contact Numbers

A sign/s shall be displayed adjacent to the site access point/s throughout the duration of the works with the contact details of the Contractor and project manager as provided and maintained by the Contractor.

9.17 Site Security

The remedial areas shall be secured against unauthorised access by means of an appropriate fence or barricade or other means by the Contractor. All persons working in asbestos remedial areas must be inducted, have undertaken required training and don appropriate PPE. The access gates to the site will be locked at all times when remedial works are not occurring.

9.18 Community Consultation

Owners and/or occupants of adjacent premises and across the road from the site will be notified at least seven days prior to the commencement of preparation for the remediation works. As a minimum, the notification shall include the details of an appropriate contact person.

9.19 Health and Safety Management

A Work Health & Safety Management Plan (WHSP) shall be prepared by the Contractor prior to commencement of remediation works on the site. The Plan shall contain procedures and requirements that are to be implemented as a minimum during the works.

The objectives of the WHSP are:

- Ensure all regulatory requirements for the proposed works are satisfied;
- To apply standard procedures that minimises risks resulting from the works;
- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the general public.

These objectives will be achieved by:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards, mandatory safety practices and procedures;
- Monitoring of potential hazards and implementation of corrective measures; and

Provision for contingencies that may arise while operations are being conducted at the site.

10. Regulatory Approvals / Licensing

10.1 Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No .2 – 1997)

The site is located within the boundary of SREP20. In accordance with Part 3 Clause 11 (4) of SREP20, development consent is required for remediation of contaminated land.

10.2 State Environment Planning Policy Number 55 (SEPP55) Remediation of Land

Under Clause 9 (d) of SEPP 55, remediation work is considered Category 1 remediation work (i.e., requiring development consent) when the development for which another State environmental planning policy or a regional environmental plan requires development consent. As per Section 10.1, the site is located within the boundary of SREP20 and therefore any remediation works require development consent under SREP20. On this basis, the proposed remedial works at the site are considered to be Category 1 Remedial Works (as per SEPP 55) and require consent.

10.3 Protection of the Environment Operations Act 1997

The proposed remediation/validation activities are not required to be licensed under *the Protection of the Environment Operation Act (1997)* since the works do not involve:

- Treat otherwise than by incineration and store more than 30 000 cubic metres of contaminated soil originating exclusively from the site, or
- Disturb more than an aggregate area of 3 hectares of contaminated soil originating exclusively from the site.

10.4 Protection of The Environment Operations (Waste) Regulation 2014

The regulations make requirements relating to non-licensed waste activities and waste transporting. The proposed works on the site will not require to be licensed.

Under Clauses 76 and 79 of the POEO Regulation 2014, asbestos waste (> 100 kgs, or more than 10 m^2 in a single load), must be tracked using WasteLocate.

Section 42 of the Regulation stipulates special transportation, reporting, re-use and recycling requirements relating to asbestos waste and must be complied with regardless whether the activity is licensed.

The requirements for the transportation of asbestos waste include:

- Bonded asbestos material must be securely packaged at all times;
- Friable asbestos material must be kept in a sealed container;
- Asbestos-contaminated soils must be wetted down; and
- All asbestos waste must be transported in a covered, leak-proof vehicle.

The transporter of asbestos waste must cause the following information to be given to the EPA prior to the transportation of asbestos waste loads:

- Source site details including address, name and contact details;
- Date of proposed transportation commencement;
- Name, address and contact details of disposal site; and
- Approximate weight of each class of asbestos in each load.

The transporter of asbestos waste must ensure the following information is given to the disposal site before or at delivery:

- Unique consignment code issued by EPA in relation to that load; and

- Any other information specified in the Asbestos and Waste Tyres Guidelines.

The requirements relating to the off-site disposal of asbestos waste are as follows:

- Asbestos waste in any form must be disposed of only at a landfill site that may lawfully receive the waste,
- When asbestos waste is delivered to a landfill site, the occupier of the landfill site must be informed by the person delivering the waste that the waste contains asbestos,
- When unloading and disposing of asbestos waste at a landfill site, the waste must be unloaded and disposed of in such a manner as to prevent the generation of dust or the stirring up of dust,
- Asbestos waste disposed of at a landfill site must be covered with virgin excavated natural material or other material as approved in the facility's environment protection licence.

Section 48 of the Regulation requires that wastes are stored in an environmentally safe manner. It also stipulates that vehicles used to transport waste must be covered when loaded.

10.5 Waste Classification Guidelines (EPA 2014)

All wastes generated and proposed to be disposed offsite shall be assessed, classified and managed in accordance with this guideline. Where wastes require immobilisation prior to offsite disposal (to reduce waste classifications) an immobilisation approval shall be sought in accordance with Part 2 of this guideline. Immobilisations are only anticipated to be required with unexpected finds that cannot be retained on site and cannot be disposed directly offsite to a licensed facility.

10.6 Asbestos Removal Regulations and Codes of Practice

The remediation of fill containing asbestos will be managed in accordance with the Work Health and Safety Act (2011) and Work Health and Safety Regulation (2017), "*How to Safely Remove Asbestos: Code of Practice,* SafeWork Australia (SWA 2016a), *How to Manage and Control Asbestos in the Workplace Code of Practice*, SafeWork Australia (SWA 2016b), NSW WorkCover Guidelines and the NSW EPA Waste Classification Guidelines.

Excavation, onsite remediation and removal of asbestos impacted soils are required to be conducted by a Class A (Friable) or B (Bonded) Asbestos Removal licensed contractor.

All airborne asbestos fibre monitoring works must be undertaken by a competent person or Licenced Asbestos Assessor, in accordance with SafeWork NSW requirements.

Before starting the affected works, licensed asbestos removal contractor shall be responsible for submitting the appropriate WorkSafe NSW permit (friable or non-friable) to remove asbestos at least five business days prior to the proposed works where required.

11. Conclusions and Recommendations

11.1 Conclusions

Overall, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Sites Guidelines for the NSW Site Auditor Scheme (3nd Edition)* (EPA 2017) because they are: technically feasible; environmentally justifiable; and consistent with relevant laws, policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures detailed in this RAP and subject to the limitations in **Section 12**, it is considered the site can be made suitable for the intended hospital land use.

11.2 Recommendations

The existing AMP and Asbestos Register should be updated such that current/future occupational exposures may be appropriately managed under the WHS Act (2011).

Upon completion of the remediation works, a validation report shall be prepared to document that the site is suitable for the proposed hospital land use. Should onsite containment be adopted as the preferred remedial strategy, a Long Term Asbestos Management Plan will be required to be prepared and implemented at the site.

12. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

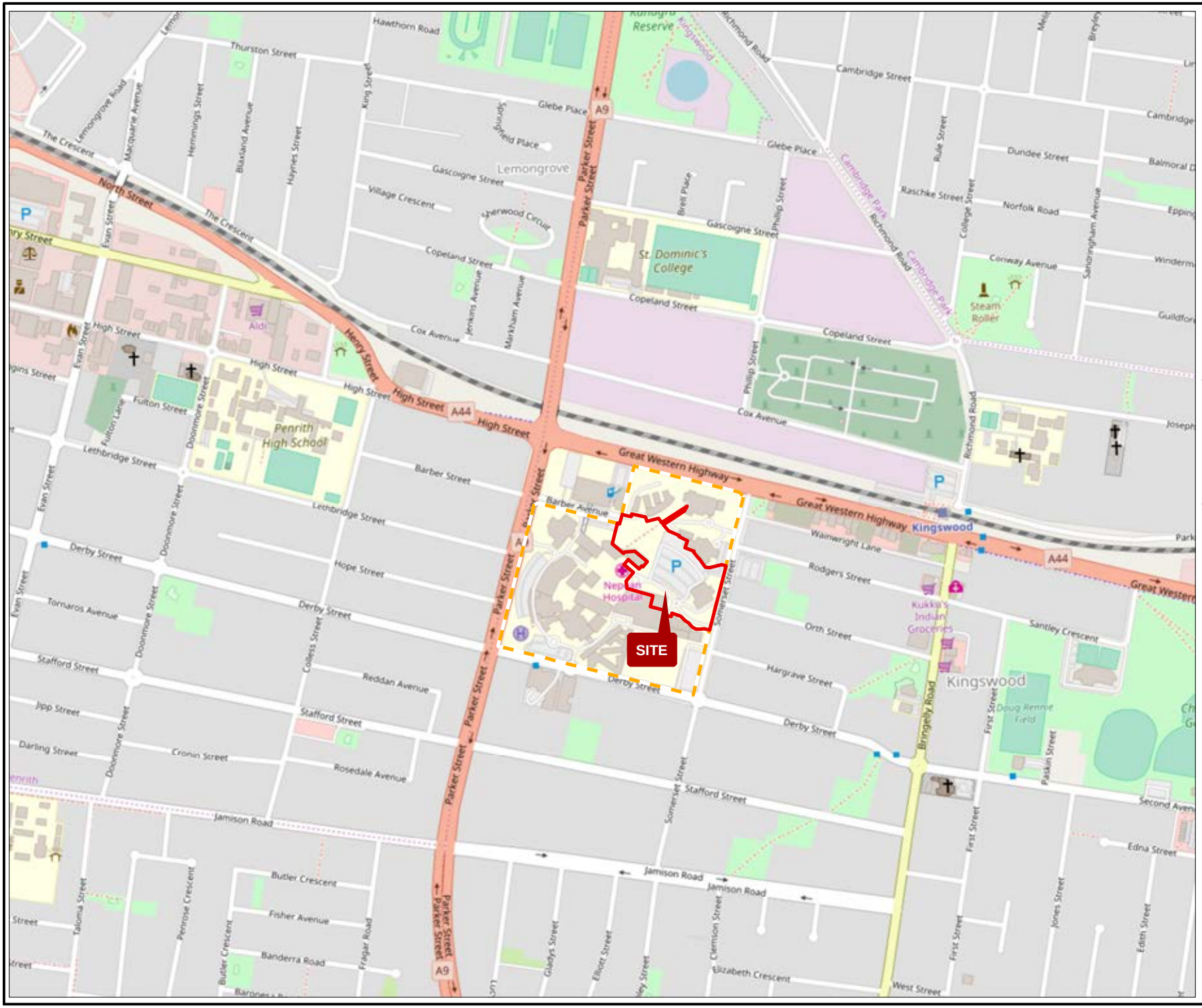
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Figures



Legend:

- Approximate Precinct Boundary
- Approximate Site Boundary

JBS&G

Job No: 54794

Client: CPB Contractors

Version: R05 Rev 0	Checked By: MH
Date 9/11/2018	Drawn By: AV

Scale 1:10,000

0 120 240

metres

Coor. Sys. GDA 1994 MGA Zone 56

Nepean Hospital
Derby Street
Kingswood NSW 2747

Lot 1 DP1114090

SITE LOCATION

FIGURE: 1

File Name: 54794_01_SiteLoc

Reference: © OpenStreetMap (and) contributors, CC-BY-SA

Legend:

- Approximate Site Boundary
- Approximate Precinct Boundary
- Building Footprint / Hardstand

JBS&G

Job No: 54794

Client: CPB Contractors

Version: R05 Rev 0	Checked By: MH
Date 9/11/2018	Drawn By: AV

Scale 1:2,550

0 30 60

metres

Coor. Sys. GDA 1994 MGA Zone 56

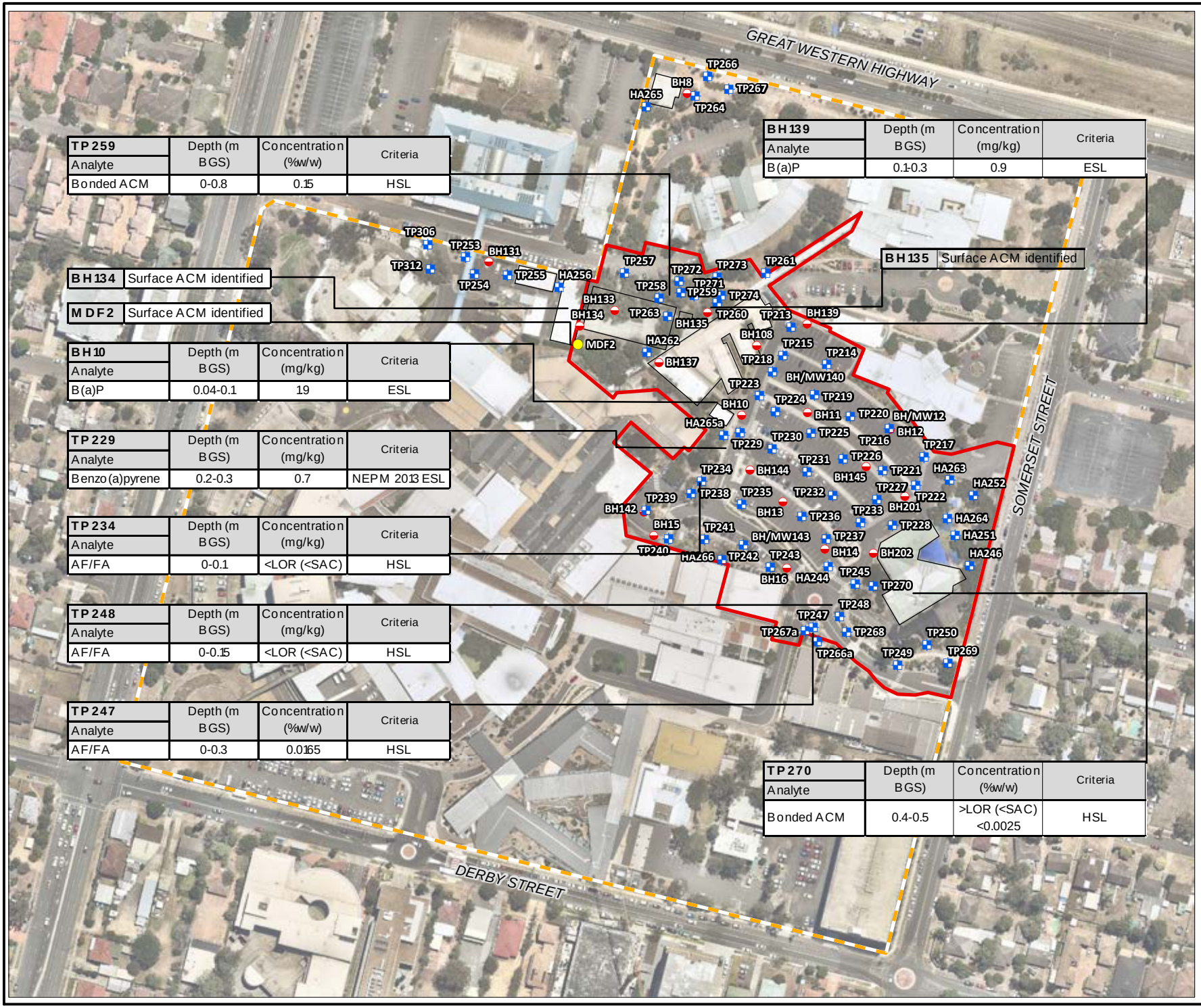
Nepean Hospital
Derby Street
Kingswood NSW 2747

Lot 1 DP1114090

SITE LAYOUT

FIGURE: 2

File Name: 54794_02_SiteLay
Reference: Nearmap - nearmap.com.au - Imagery 20-01-2018



TP259	Depth (m BGS)	Concentration (%w/w)	Criteria
Analyte			
Bonded ACM	0-0.8	0.15	HSL

BH139	Depth (m BGS)	Concentration (mg/kg)	Criteria
Analyte			
B(a)P	0.1-0.3	0.9	ESL

BH134	Surface ACM identified

BH135	Surface ACM identified

MDF2	Surface ACM identified

BH10	Depth (m BGS)	Concentration (mg/kg)	Criteria
Analyte			
B(a)P	0.04-0.1	19	ESL

TP229	Depth (m BGS)	Concentration (mg/kg)	Criteria
Analyte			
Benzo(a)pyrene	0.2-0.3	0.7	NEPM 2013 ESL

TP234	Depth (m BGS)	Concentration (mg/kg)	Criteria
Analyte			
AF/FA	0-0.1	<LOR (<SAC)	HSL

TP248	Depth (m BGS)	Concentration (mg/kg)	Criteria
Analyte			
AF/FA	0-0.15	<LOR (<SAC)	HSL

TP247	Depth (m BGS)	Concentration (%w/w)	Criteria
Analyte			
AF/FA	0-0.3	0.0165	HSL

TP270	Depth (m BGS)	Concentration (%w/w)	Criteria
Analyte			
Bonded ACM	0.4-0.5	>LOR (<SAC) <0.0025	HSL

Legend:

- Approximate Precinct Boundary
- Approximate Site Boundary
- Building Footprint / Hardstand
- Data Gap Sample Location

Former Sample Location (EIS 2017)

- ACM
- Borehole
- Test Pit

JBS&G

Job No: 54794

Client: CPB Contractors

Version: R05 Rev 0 | Checked By: MH

Date 16/04/2019 | Drawn By: AV

Scale 1:2,550

0 30 60

metres

Coor. Sys. GDA 1994 MGA Zone 56

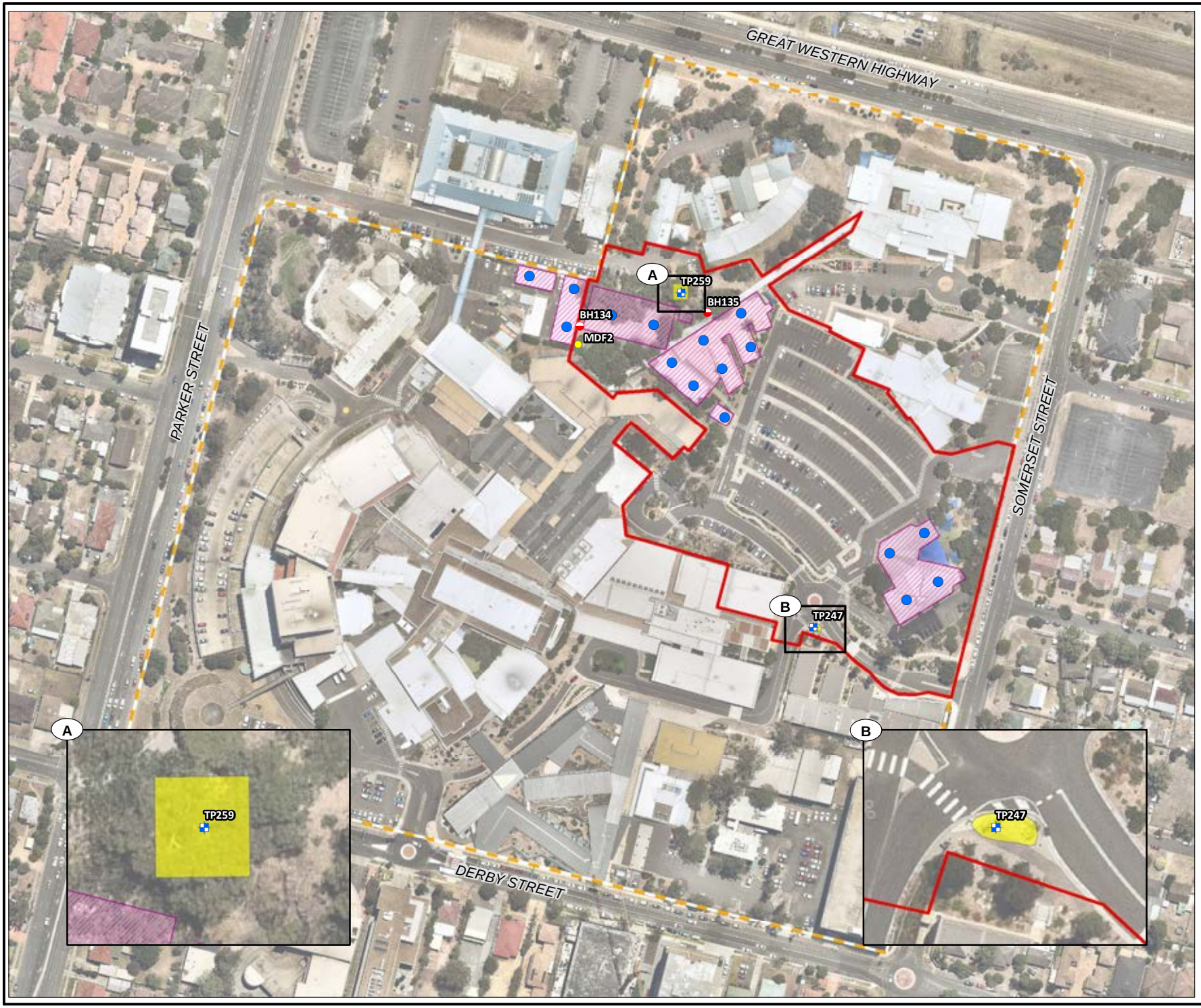
Nepean Hospital
Derby Street
Kingswood NSW 2747

Lot 1 DP1114090

PREVIOUS SAMPLE LOCATIONS AND SOIL EXCEEDANCES

FIGURE: 3

File Name: 54794_03_PreviousSamples
Reference: Nearmap - nearmap.com.au - Imagery 20-01-2018



Legend:

- Approximate Precinct Boundary
- Approximate Site Boundary
- Data Gap Requiring Further Assessment
- Proposed Sample Location - 20m

Remedial Extent

- On-site Containment or Off-site Disposal
- Data Gap Sample Location

Former Sample Location (EIS

- ACM
- Borehole

JBS&G

Job No: 54794

Client: CPB Contractors

Version: R05 Rev 0	Checked By: MH
Date 16/04/2019	Drawn By: AV

Scale 1:2,550

0 30 60

metres

Coor. Sys. GDA 1994 MGA Zone 56

Nepean Hospital
Derby Street
Kingswood NSW 2747

Lot 1 DP1114090

REMEDIAL EXTENTS

FIGURE: 4

File Name: 54794_04_RemExtents
Reference: Nearmap - nearmap.com.au - Imagery 20-01-2018

Appendix A Proposed Development Plans

GREAT WESTERN HIGHWAY

CANCER SERVICES

TRESILLIAN

GATEWAY

DRUG & ALCOHOL

PRIVATE HOSPITAL

HOPE COTTAGE

PUBLIC AND STAFF CARPARK

CHILD CARE

BARBER AVENUE

MAINTENANCE & ASSET MANAGEMENT

POPULATION HEALTH

MEDICAL ACCOMMODATION

STES

NORTH BLOCK

NORTH BLOCK

CARPARK

NORTH BLOCK

EAST BLOCK

ORAL HEALTH

NON CLINICAL SUPPORT

NON CLINICAL SUPPORT

SEXUAL HEALTH

CARPARK

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(02) 8247 8400

CONSULTANT
STEENSEN VARMING
(02) 9967 2200

CONSULTANT
WARREN SMITH & PARTNERS
(02) 9272 5100

CONSULTANT
MBM (02) 9270 1000

CONSULTANT
BLACKETT MAGUIRE AND GOLDSMITH
(02) 9211 7777

PROJECT MANAGER
CBRE
(02) 9333 3333

MANAGING CONTRACTOR
CPB CONTRACTORS

CLIENT
NSW GOVERNMENT Health Infrastructure

HEALTH INFRASTRUCTURE
CLIENT NUMBER

NHR
PROJECT

NEPEAN
DERBY ST
KINGSWOOD NSW 2747
BVN PROJECT NUMBER

S1607004.INH
DRAWING KEY

TRUE NORTH PROJECT NORTH

GRAPHIC SCALE
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STATUS

DEVELOPMENT APPLICATION
DRAWING

EXISTING SITE PLAN

NHR-BVN-AR-K-DWG
A0 - 105

ISSUE
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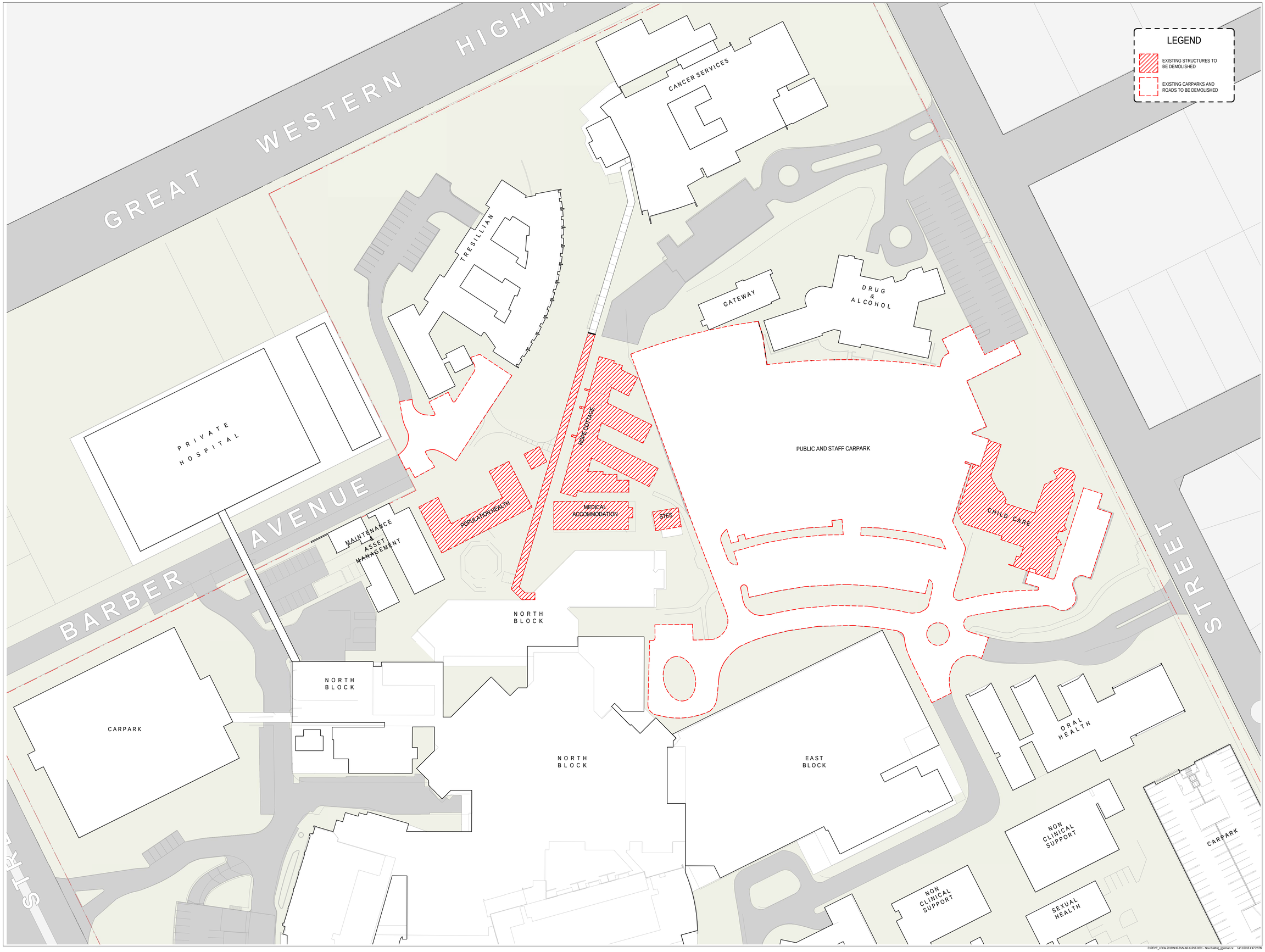

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DEVELOPMENT APPLICATION
DRAWING

DEMOLITION PLAN

NHR-BVN-AR-K-DWG
A0 - 106
ISSUE
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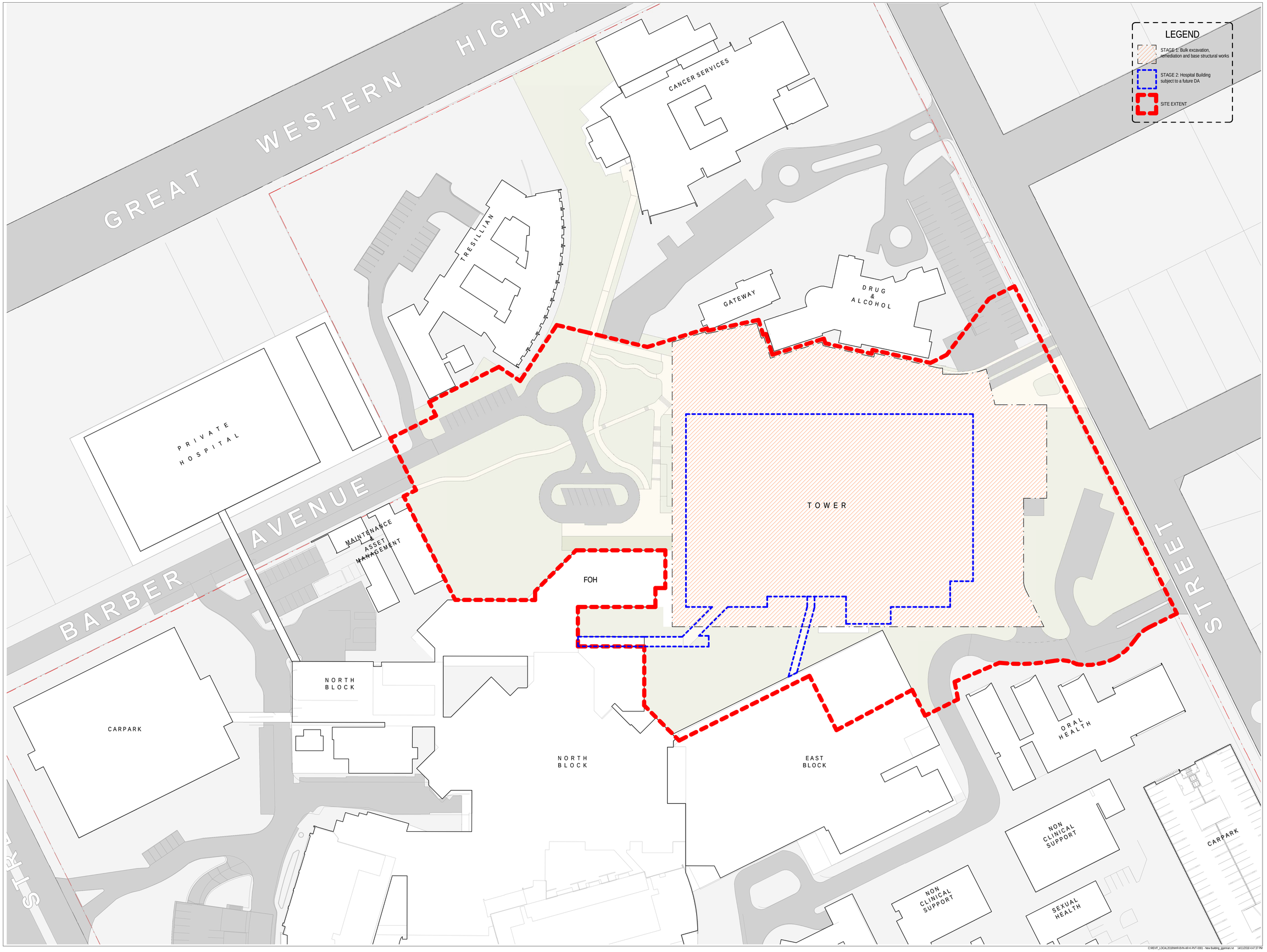

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(02) 9272 5100

CONSULTANT
MBM (02) 9270 1000

CONSULTANT
BLACKETT MAGUIRE AND GOLDSMITH
(02) 9211 7777
PROJECT MANAGER

CBRE
(02) 9333 3333
MANAGING CONTRACTOR

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HEALTH INFRASTRUCTURE
CLIENT NUMBER

NHR
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DEVELOPMENT APPLICATION
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NHR-BVN-AR-K-DWG
A0 - 107

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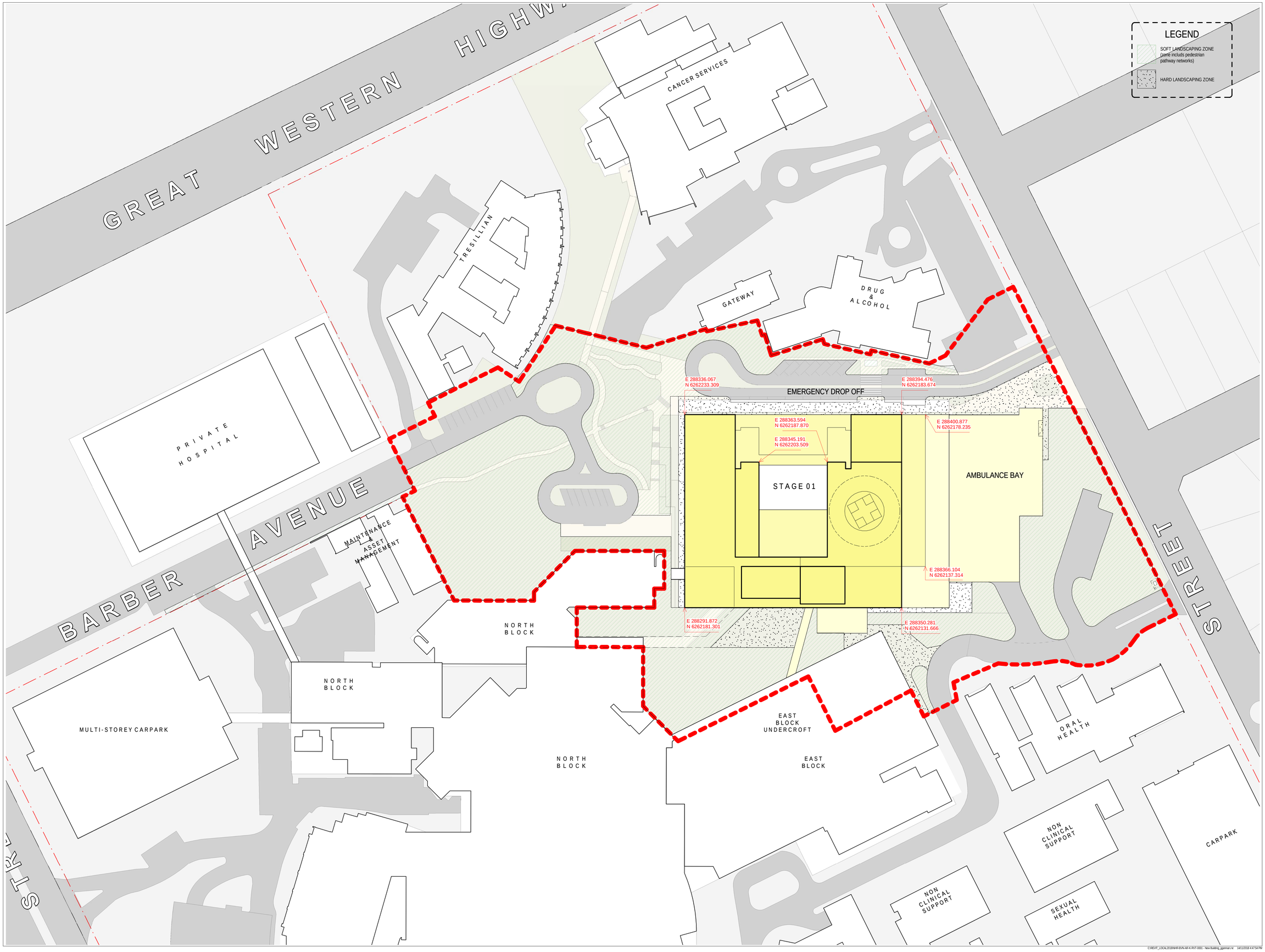

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DRAWING
PROPOSED SITE PLAN

NHR-BVN-AR-K-DWG
A0 - 108

ISSUE
B

Appendix B Summary Tables

Table A: Asbestos Quantification Summary Table
Job #: 54794
Client: CPB
Name: Main Works DGA

Health Screening Level Asbestos Concentration in Soil (% w/w)	
Category	**HSL A / HSL B**
Bonded ACM in soils	**0.01 / 0.04**
FA and AF in soils	**0.001**
Visible Surface Asbestos	**No Visible ACM**

Sample Information			Field Asbestos Quantification								Laboratory Analysis									
Sample ID	Date	Lab Report Number	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Sample Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	AF Mass (g)	Mass Asbestos in AF (g)	Mass Asbestos in FA & AF (g)	[Asbestos from FA & AF in soil] (%w/w)
HA244-0.05-0.15	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	609	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA244-0.15-0.35	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	578	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA246-0.3-0.4	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	760	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA246-0-0.3	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	642	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA251-0.2-0.3	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	685	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA251-0.3-0.6	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	614	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA251-0-0.2	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	637	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA252-0.05-0.52	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	492	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA252-0.52-0.65	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	840	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA262-0-0.4	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	544	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
QC20180806-01	2018/08/06	611286	50	81500.00	0.0	0.0	0.00	0	0	0	591	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
QC20180806-02	2018/08/06	611286	50	81500.00	0.0	0.0	0.00	0	0	0	466	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
QC20180806-03	2018/08/06	611286	50	81500.00	0.0	0.0	0.00	0	0	0	493	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP213-0.02-0.4	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	775	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP213-0.4-1.0	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	594	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP213-1.0-1.55	2018/07/26	610354	50	81500.00	0.0	0.0	0.00	0	0	0	616	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP214-0.03-0.4	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	747	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP214-0.4-1.4	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	563	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP214-1.4-2.0	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	537	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP215-0.03-0.45	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	700	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP215-0.45-1.1	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP216-0.04-0.15	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	876	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP216-0.15-0.6	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	840	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP216-0.6-1.1	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	511	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP217-0.06-0.45	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	709	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP217-0.45-1.15	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	589	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP218-0.04-0.4	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	746	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP218-0.4-0.8	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	545	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP219-0.03-0.3	2018/07/30	610354	50	81500.00	0.0	0.0	0.00	0	0	0	800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP219-0.3-1.0	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	494	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP220-0.04-0.25	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	682	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP221-0.04-0.4	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	721	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP221-0.4-0.9	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	723	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP222-0.05-0.5	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	669	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP222-0.5-1.0	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	717	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP223-0.05-0.3	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	934	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP223-0.4-0.5	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	504	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP224-0.04-0.4	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	770	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP224-0.4-0.6	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	556	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP225-0.1-0.2	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	683	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP225-0.3-0.4	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	650	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP225-0.4-0.65	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	534	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP226-0.06-0.2	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	798	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP226-0.2-0.45	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	912	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP227-0.06-0.2	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	644	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP227-0.2-0.4	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	886	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP228-0.05-0.2	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	863	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP228-0.2-0.45	2018/08/02	611286	50	81500.00	0.0	0.0	0.00	0	0	0	522	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP229-0.06-0.3	2018/07/28	610354	50	81500.00	0.0	0.0	0.00	0	0	0	629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP229-0.3-0.5	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	768	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP230-0.06-0.45	2018/07/28	610354	50	81500.00	0.0	0.0	0.00	0	0	0	683	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP231-0.06-0.43	2018/07/28	610354	50	81500.00	0.0	0.0	0.00	0	0	0	732	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP232-0.06-0.3	2018/07/28	610354	50	81500.00	0.0	0.0	0.00	0	0	0	772	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP232-0.3-0.6	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	614	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP233-0.3-0.4	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	698	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP233-0.4-0.8	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	562	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP234-0.1-0.3	2018/07/27	610354	25	40750.00	0.0	0.0	0.00	0	0	0	675	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP234-0-0.1	2018/07/27	610354	50	81500.00	0.0	0.0	0.00	0	0	0	546	0.0000	0.0000	0.0000	0.0058	0.0015	0.0000	0.0000	0.0015	**0.0003**
TP236-0.06-0.3	2018/07/28	610354	50	81500.00	0.0	0.0	0.00	0	0	0	809	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP236-0.3-0.5	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	609	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP237-0.06-0.3	2018/07/28	610354	50	81500.00	0.0	0.0	0.00	0	0	0	849	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP237-0.3-0.5	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	561	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP238-0.15-0.3	2018/07/27	610354	50	81500.00	0.0	0.0	0.00	0	0	0	688	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP238-0-0.15	2018/07/27	610354	20	32600.00	0.0	0.0	0.00	0	0	0	459	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP239-0-0.3	2018/07/27	610354	50	81500.00	0.0	0.0	0.00	0	0	0	442	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP240-0-0.05	2018/07/27	610354	20	32600.00	0.0	0.0	0.00	0	0	0	381	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP241-0-0.1	2018/07/27	610354	20	32600.00	0.0	0.0	0.00	0	0	0	534	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP242-0-0.1	2018/07/27	610354	20	32600.00	0.0	0.0	0.00	0	0	0	685	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP243-0-0.1	2018/08/01	611286	20	32600.00	0.0	0.0	0.00	0	0	0	671	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table A: Asbestos Quantification Summary Table
Job #: 54794
Client: CPB
Name: Main Works DGA

Health Screening Level Asbestos Concentration in Soil (% w/w)	
Category	**HSL A / HSL B**
Bonded ACM in soils	**0.01 / 0.04**
FA and AF in soils	**0.001**
Visible Surface Asbestos	**No Visible ACM**

Sample Information			Field Asbestos Quantification								Laboratory Analysis									
Sample ID	Date	Lab Report Number	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Sample Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	AF Mass (g)	Mass Asbestos in AF (g)	Mass Asbestos in FA & AF (g)	[Asbestos from FA & AF in soil] (%w/w)
TP245-0-0.15	2018/07/27	610354	50	81500.00	0.0	0.0	0.00	0	0	0	465	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP247-0.3-0.9	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	744	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP247-0-0.3	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	524	0.0000	0.0000	0.0000	0.0865	0.0865	0.0000	0.0000	0.0865	**0.0165**
TP248-0-0.15	2018/08/01	611286	50	81500.00	0.0	0.0	0.00	0	0	0	482	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0005	0.0005	**0.0001**
TP249-0.1-0.3	2018/07/27	610354	20	32600.00	0.0	0.0	0.00	0	0	0	577	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP249-0-0.1	2018/07/27	610354	50	81500.00	0.0	0.0	0.00	0	0	0	536	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP250-0.15-0.35	2018/07/27	610354	50	81500.00	0.0	0.0	0.00	0	0	0	699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP250-0-0.15	2018/07/27	610354	20	32600.00	0.0	0.0	0.00	0	0	0	553	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP253-0.04-0.45	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	805	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP254-0.035-0.45	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	883	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP255-0.035-0.45	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	687	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP257-0.1-0.65	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	550	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP257-0-0.1	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	299	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP258-0.05-0.45	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	748	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP258-0-0.05	2018/08/03	611286	10	16300.00	0.0	0.0	0.00	0	0	0	259	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP259-0-0.05	2018/08/03	611286	20	32600.00	0.0	0.0	0.00	0	0	0	334	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP259-0-0.8	2018/08/03	611286	50	81500.00	**800.0**	**120.0**	**0.15**	0	0	0	620	1.5690	0.2668	**0.0430**	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP260-0-0.1	2018/08/03	611286	20	32600.00	0.0	0.0	0.00	0	0	0	373	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP261-0.1-0.3	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	576	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP261-0-0.1	2018/08/03	611286	50	81500.00	0.0	0.0	0.00	0	0	0	500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP262-0.15-0.6	2018/08/06	611286	50	81500.00	0.0	0.0	0.00	0	0	0	600	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP262-0-0.15	2018/08/06	611286	50	81500.00	0.0	0.0	0.00	0	0	0	572	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP263-0.04-0.14	2018/08/06	611286	50	81500.00	0.0	0.0	0.00	0	0	0	590	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP263-0-0.05	2018/08/03	611286	20	32600.00	0.0	0.0	0.00	0	0	0	455	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP264-0.08-0.8	2018/08/06	611286	50	81500.00	0.0	0.0	0.00	0	0	0	567	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP264-0.8-0.85	2018/08/06	611286	50	81500.00	0.0	0.0	0.00	0	0	0	469	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA263_0-0.1	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	459	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA264_0-0.1	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	675	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
QC20180918-01	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	760	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
QA20180918-01	2018/09/18	201205	50	81500.00	0.0	0.0	0.00	0	0	0	694	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
(HA265a) HA265_0.4-0.5	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	708	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
(HA265a) HA265_0-0.1	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	664	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA266_0.3-0.4	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	529	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HA266_0-0.1	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	571	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
(TP266a) TP266_0.2-0.3	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	694	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
(TP266a) TP266_0.6-0.7	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	911	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP267_0.2-0.3	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	510	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP267_0.6-0.7	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	659	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP268_0.4-0.5	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	716	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP269_0.5-0.6	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	681	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
QC20180918-02	2018/09/18	618347	50	81500.00	0.0	0.0	0.00	0	0	0	723	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
QA20180918-02	2018/09/18	201205	50	81500.00	0.0	0.0	0.00	0	0	0	731	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP270_0.4-0.5	2018/09/18	618347	50	81500.00	**14.0**	**2.1**	**0.0025**	0	0	0	701	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP271_0.5-0.8	2018/09/19	618564	50	81500.00	0.0	0.0	0.00	0	0	0	825	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP272_0.3-0.5	2018/09/19	618565	50	81500.00	0.0	0.0	0.00	0	0	0	1041	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP273_0.5-0.7	2018/09/19	618566	50	81500.00	0.0	0.0	0.00	0	0	0	863	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TP274_0.6-0.7	2018/09/19	618567	50	81500.00	0.0	0.0	0.00	0	0	0	951	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table B: Stage 1 Tower Soil Analytical Sumamry
Project Number: 54794
Project Name: Main Works DGA

	Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEX					
	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	>C6-C9 Fraction	>C10-C14 Fraction	>C15-C28 Fraction	>C29-C36 Fraction	>C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Total)	>C10-C16 less Naphthalene (F2)	>C6-C10 Fraction	>C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	2.00	0.40	1.00	1.00	1.00	0.10	1.00	1.00	20.00	20.00	50.00	50.00	50.00	50.00	100.00	100.00	50.00	50.00	20.00	20.00	0.10	0.10	0.10	0.10	0.20	0.30
NEPM 2013 EIL - Urban Residential (site specific)	100		190	60	1100		270	770																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil															1300	5600		120		180	65	125	105			45
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine														1000	3500	10000			800							
NEPM 2013 Soil HIL B	500	150	500	30000	1200	120	1200	60000																		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		280		50	0.7	NL	480			110
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		NL		90	1	NL	NL			310

Field_ID	LocCode	Sample Date	Sample Type	Lab Report																								
HA244-0.2-0.3	HA244-0.2-0.3	2018/07/30	FILL	610482	8.6	<0.4	23	37	24	<0.1	40	70	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA251-0.2-0.3	HA251-0.2-0.3	2018/07/26	FILL	610482	5.9	<0.4	16	22	21	<0.1	16	95	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA251-0-0.1	HA251-0-0.1	2018/07/26	FILL	610482	5	<0.4	12	20	19	<0.1	9	61	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA252-0.55-0.65	HA252-0.55-0.65	2018/07/26	FILL	610482	4.4	<0.4	28	46	<5	<0.1	150	80	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA264_0-0.1	HA264_0-0.1	2018/09/18	Additional DGA - WC	618884	5.5	<0.4	17	28	13	<0.1	19	240	<20	<20	120	110	230	<50	180	<100	180	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA266_0.3-0.4	HA266_0.3-0.4	2018/09/18	Additional DGA - WC	618884	4.4	<0.4	12	21	18	<0.1	7.2	69	<20	<20	120	210	330	<50	270	120	390	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QA20180726-01	HA251-0-0.1	2018/07/26	FILL	197709	<4	<0.4	22	17	15	<0.1	17	72	<25	<50	<100	<100	-	<50	<100	<100	<50	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1
QA20180727-01	TP241 0.2-0.3	2018/07/27	VENM	197708	<4	<0.4	14	13	13	<0.1	7	25	<25	<50	<100	<100	-	<50	<100	<100	<50	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1
QA20180801-04	TP243 0-0.1	2018/08/01	FILL	198047	<4	<0.4	10	51	22	<0.1	7	92	<25	<50	<100	<100	-	<50	<100	<100	<50	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1
QC20180726-01	HA251-0-0.1	2018/07/26	FILL	610482	4.8	<0.4	12	20	19	<0.1	8.4	78	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QC20180727-01	TP241 0.2-0.3	2018/07/27	VENM	610636	6.2	<0.4	24	23	15	<0.1	6.7	33	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QC20180801-04	TP243 0-0.1	2018/08/06	FILL	611277	3.4	<0.4	13	42	22	<0.1	7.6	95	<20	<20	59	84	143	<50	120	<100	120	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QC20180918-02	TP269_0.5-0.6	2018/09/18	Additional DGA - WC	618884	9.2	<0.4	28	23	23	<0.1	9.9	49	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP213 1.55-1.65	TP213	2018/07/26	VENM	610636	8.5	<0.4	23	14	17	<0.1	<5	18	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP213-0.1-0.2C	TP213-0.1-0.2C	2018/07/26	REC-AGG	610632	2.8	<0.4	20	37	53	<0.1	21	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP214-0.2-03C	TP214-0.2-03C	2018/07/30	REC-AGG	610632	2.8	<0.4	31	34	34	<0.1	40	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP215-0.3-0.4C	TP215-0.3-0.4C	2018/07/30	REC-AGG	610632	3.2	<0.4	20	28	27	<0.1	20	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP215-0.5-0.6	TP215-0.5-0.6	2018/07/30	FILL	610482	22	<0.4	32	20	24	<0.1	5.9	26	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP216-0.05-0.15C	TP216-0.05-0.15C	2018/08/01	REC-AGG	611251	3.3	<0.4	21	37	47	<0.1	23	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP218-0.1-0.2C	TP218-0.1-0.2C	2018/08/01	REC-AGG	611251	3.4	<0.4	21	43	28	<0.1	26	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP219-0.05-0.15C	TP219-0.05-0.15C	2018/07/30	REC-AGG	610632	2.3	<0.4	19	40	62	<0.1	27	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP220-0.1-0.2C	TP220-0.1-0.2C	2018/08/01	REC-AGG	611251	2.5	<0.4	18	30	39	0.1	33	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP221_0.9-1.0	TP221_0.9-1.0	2018/08/02	VENM	611234	10	<0.4	18	23	13	<0.1	8.2	33	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP221-0.2-0.3C	TP221-0.2-0.3C	2018/08/01	REC-AGG	611251	3.2	<0.4	81	42	15	<0.1	92	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP223-0.2-0.3C	TP223-0.2-0.3C	2018/08/01	REC-AGG	611251	2.5	<0.4	33	30	16	<0.1	51	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP224-0.1-0.2C	TP224-0.1-0.2C	2018/08/01	REC-AGG	611251	3.3	<0.4	26	26	39	0.2	18	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP225 0.4-0.5	TP225 0.4-0.5	2018/08/01	FILL	611277	14	<0.4	35	25	28	<0.1	7.8	38	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP225-0.1-0.2C	TP225-0.1-0.2C	2018/08/01	REC-AGG	611251	2.7	<0.4	19	19	20	<0.1	21	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP227-0.1-0.2C	TP227-0.1-0.2C	2018/08/01	REC-AGG	611251	3	<0.4	24	36	19	<0.1	29	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP228-0.1-0.2C	TP228-0.1-0.2C	2018/08/01	REC-AGG	611251	4.9	<0.4	27	34	19	<0.1	18	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP229-0.2-0.3	TP229-0.2-0.3	2018/07/28	FILL	610482	2.1	<0.4	23	36	15	<0.1	35	57	<20	<20	90	190	280	<50	230	150	380	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP229-0.3-0.4C	TP229-0.3-0.4C	2018/08/01	REC-AGG	611251	3.3	<0.4	54	40	18	<0.1	81	96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP230-0.06-0.45C	TP230-0.06-0.45C	2018/07/28	REC-AGG	610632	2.3	<0.4	66	36	12	<0.1	87	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP231 0.5-0.6	TP231	2018/07/27	VENM	610636	11	<0.4	23	19	16	<0.1	<5	25	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP232-0.2-03C	TP232-0.2-03C	2018/08/01	REC-AGG	611251	2.8	<0.4	70	40	14	<0.1	110	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP233-0.1-0.3C	TP233-0.1-0.3C	2018/07/28	REC-AGG	610632	4.6	<0.4	39	33	22	<0.1	37	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP235 0.8-0.85	TP235	2018/07/27	VENM	610636	7.2	<0.4	13	14	13	<0.1	<5	9.3	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP236-0.1-0.3C	TP236-0.1-0.3C	2018/07/28	REC-AGG	610632	2.3	<0.4	47	41	14	<0.1	54	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP236-0.2-0.3	TP236-0.2-0.3	2018/07/28	FILL	610482	2.1	<0.4	94	30	8.6	<0.1	100	59	<40	<20	<50	110	110	<50	120	<100	120	<50	<40	<40	<0.2	<0.2	<0.2	<0.2	<0.4	<0.6
TP237-0.1-0.3C	TP237-0.1-0.3C	2018/07/28	REC-AGG	610632	2.5	<0.4	48	26	14	<0.1	53	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP238-0.3-0.4	TP238-0.3-0.4	2018/07/26	FILL	610482	12	<0.4	25	17	23	<0.1	9.6	40	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP239 0.3-0.4	TP239	2018/07/27	VENM	610636	5.8	<0.4	22	18	15	<0.1	8.3	29	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP240-0-0.05	TP240-0-0.05	2018/07/26	FILL	610482	3.8	<0.4	14	29	19	<0.1	6.7	70	<20	<20	130	190	320	<50	260	<100	260	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP241 0.2-0.3	TP241	2018/07/27	VENM	610636	6	<0.4	23	21	15	<0.1	6.6	31	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP243 0-0.1	TP243 0-0.1	2018/08/01	FILL	611277	<2	<0.4	7.2	25	14	<0.1	6.2	52	<20	<20	<50	81	81	<50	110	<100	110	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP249 0.4-0.5	TP249	2018/07/27	VENM	610636	7.4	<0.4	23	20	15	<0.1	6.9	31	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP258_0.45-0.55	TP258_0.45-0.55	2018/08/02	VENM	611234	14	<0.4	27	18	34	<0.1	7.8	38	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP260_0.2-0.3	TP260_0.2-0.3	2018/08/02	VENM	611234	16	<0.4	42	17	29	<0.1	6.7	28	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP261_0.3-0.4	TP261_0.3-0.4	2018/08/02	VENM	611234	6.9	<0.4	11	26	31	<0.1	6.2	31	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP268_0.4-0.5	TP268_0.4-0.5	2018/09/18	Additional DGA - WC	618884	3.2	<0.4	17	15	13	<0.1	7.8	41	<20	<20	98	170	268	<50	220	<100	220	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP269_0.5-0.6	TP269_0.5-0.6	2018/09/18	Additional DGA - WC	618884	13	<0.4	31	25	26	<0.1	10	47	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP272_0.3-0.5	TP272_0.3-0.5	2018/09/19	Additional DGA - WC	618884	5.1	<0.4	31	37	20	<0.1	76	76	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP274_0.6-0.7	TP274_0.6-0.7	2018/09/19	Additional DGA - WC	618884	17	<0.4	31	19	29	<0.1	8.4	41	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3

Statistical Summary

Number of Results	53	53	53	53	53	53	53	53	34	34	34	34	31	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Number of Detects	49	0	53	53	52	2	50	53	0	0	6	8	8	0	8	2	8	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<2	<0.4	7.2	13	<5	<0.1	<5	9.3	<20	<20	<50	<50	<50	<50	<100	<100	<50	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3		
Minimum Detect	2.1	ND	7.2	13	8.6	0.1	5.9	9.3	ND	ND	59	81	81	ND	110	120	110	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Maximum Concentration	22	<0.4	94	51	62	0.2	150	240	<40	<50	130	210	330	<50	270	150	390	<50	<40	<40	<0.2	<1	<0.5	<1	<2	<1		
Maximum Detect	22	ND	94	51	62	0.2	150	240	ND	ND	130	210	330	ND	270	150	390	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Average Concentration	5.8	0.2	28	28	22	0.054	28	60	11	11	41	55	75	25	83	55	88	25	11	11	0.056	0.091	0.069	0.091	0.18	0.19		
Median Concentration	4.4	0.2	23	26	19	0.05	16	59	10	10	25	25	25	25	50	50	50	25	10	10	0.05	0.05	0.05	0.05	0.1	0.15		
Standard Deviation	4.5	0	18	9.6	11	0.022	32	33	1.8	4.3	32	56	99	0	67	21	92	0	1.8	1.8	0.016	0.13	0.058	0.13	0.26	0.1		
Number of Guideline Exceedances	0	0	0	0	0	0	15	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	15	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Table B: Stage 1 Tower Soil Analytical Sumamry
Project Number: 54794
Project Name: Main Works DGA

	Polycyclic Aromatic Hydrocarbons																							Chlorinated Benzenes	Polychlorinated Biphenyls							
	Acenaphthene	Acenaphtylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	fluoranthene	Carcinogenic PAHs as B(a)P TEQ	fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Total)	Phenanthrene	Pyrene	Total Positive PAHs	Hexachlorobenzene	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.10	0.10	0.10	0.10	0.05	0.50	0.50	0.50	0.50	0.10	0.50	0.10	0.10	0.10		0.10	0.10	0.10	0.50	0.10	0.10		0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NEPM 2013 EIL - Urban Residential (site specific)																		170														
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil					0.7																											
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																
NEPM 2013 Soil HIL B						4	4	4							4				400				15								1
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		5														
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		NL														

Field_ID	LocCode	Sample Date	Sample Type	Lab Report																														
HA244-0.2-0.3	HA244-0.2-0.3	2018/07/30	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA251-0.2-0.3	HA251-0.2-0.3	2018/07/26	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA251-0-0.1	HA251-0-0.1	2018/07/26	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA252-0.55-0.65	HA252-0.55-0.65	2018/07/26	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA264_0-0.1	HA264_0-0.1	2018/09/18	Additional DGA - WC	618884	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HA266_0.3-0.4	HA266_0.3-0.4	2018/09/18	Additional DGA - WC	618884	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA20180726-01	HA251-0-0.1	2018/07/26	FILL	197709	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	<0.1	-	<0.1	<0.1	<0.1	<0.172 [#7]	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA20180077-01	TP241 0.2-0.3	2018/07/27	VENM	197708	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	<0.1	-	<0.1	<0.1	<0.1	<0.172 [#7]	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA20180801-04	TP243 0-0.1	2018/08/01	FILL	198047	<0.1	<0.1	<0.1	0.1	0.1	<0.5	<0.5	<0.5	-	0.2	-	0.1	<0.1	0.1	0.173 [#6]	<0.1	0.1	<0.1	-	<0.1	0.1	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QC20180726-01	HA251-0-0.1	2018/07/26	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QC20180727-01	TP241 0.2-0.3	2018/07/27	VENM	610636	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QC20180801-04	TP243 0-0.1	2018/08/06	FILL	611277	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QC20180918-02	TP269_0.5-0.6	2018/09/18	Additional DGA - WC	618884	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP213 1.55-1.65	TP213	2018/07/26	VENM	610636	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP213-0.1-0.2C	TP213-0.1-0.2C	2018/07/26	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP214-0.2-03C	TP214-0.2-03C	2018/07/30	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP215-0.3-0.4C	TP215-0.3-0.4C	2018/07/30	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP215-0.5-0.6	TP215-0.5-0.6	2018/07/30	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP216-0.05-0.15C	TP216-0.05-0.15C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP218-0.1-0.2C	TP218-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP219-0.05-0.15C	TP219-0.05-0.15C	2018/07/30	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP220-0.1-0.2C	TP220-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP221_0.9-1.0	TP221_0.9-1.0	2018/08/02	VENM	611234	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP221-0.2-0.3C	TP221-0.2-0.3C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP223-0.2-0.3C	TP223-0.2-0.3C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP224-0.1-0.2C	TP224-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP225 0.4-0.5	TP225 0.4-0.5	2018/08/01	FILL	611277	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP225-0.1-0.2C	TP225-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP227-0.1-0.2C	TP227-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP228-0.1-0.2C	TP228-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP229-0.2-0.3	TP229-0.2-0.3	2018/07/28	FILL	610482	<0.5	<0.5	<0.5	1.3	1.1	1.6	1.8	2.1	1	1.5	1.1	1.3	<0.5	3.1	1.828 [#10]	<0.5	1.1	<0.5	15.5	0.9	3.1	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP229-0.3-0.4C	TP229-0.3-0.4C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP230-0.06-0.45C	TP230-0.06-0.45C	2018/07/28	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP231 0.5-0.6	TP231	2018/07/27	VENM	610636	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP232-0.2-03C	TP232-0.2-03C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP233-0.1-0.3C	TP233-0.1-0.3C	2018/07/28	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP235 0.8-0.85	TP235	2018/07/27	VENM	610636	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP236-0.1-0.3C	TP236-0.1-0.3C	2018/07/28	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP236-0.2-0.3	TP236-0.2-0.3	2018/07/28	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP237-0.1-0.3C	TP237-0.1-0.3C	2018/07/28	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP238-0.3-0.4	TP238-0.3-0.4	2018/07/26	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP239 0.3-0.4	TP239	2018/07/27	VENM	610636	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP240-0-0.05	TP240-0-0.05	2018/07/26	FILL	610482	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP241 0.2-0.3	TP241	2018/07/27	VENM	610636	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP243 0-0.1	TP243 0-0.1	2018/08/01	FILL	611277	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP249 0.4-0.5	TP249	2018/07/27	VENM	610636	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP258_0.45-0.55	TP258_0.45-0.55	2018/08/02	VENM	611234	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP260_0.2-0.3	TP260_0.2-0.3	2018/08/02	VENM	611234	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP261_0.3-0.4	TP261_0.3-0.4	2018/08/02	VENM	611234	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP268_0.4-0.5	TP268_0.4-0.5	2018/09/18	Additional DGA - WC	618884	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP269_0.5-0.6	TP269_0.5-0.6	2018/09/18	Additional DGA - WC	618884	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP272_0.3-0.5	TP272_0.3-0.5	2018/09/19	Additional DGA - WC	618884	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP274_0.6-0.7	TP274_0.6-0.7	2018/09/19	Additional DGA - WC	618884	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21 [#16]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.05	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Statistical Summary

Number of Results	34	34	34	34	34	34	34	34	31	34	31	34	34	34	34	34	34	34	31	34	34	3	34	34	34	34	34	34	34	34	34	34	34	34
Number of Detects	0	0	0	2	2	1	31	31	1	2	1	2	0	2	2	0	2	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.1	<0.1	<0.1	<0.172	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Minimum Detect	ND	ND	ND	0.1	0.1	1.6	0.6	1.2	1	0.2	1.1	0.1	ND	0.1	0.173	ND	0.1	ND	15.5	0.9	0.1	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.5	<0.5	<0.5	1.3	1.1	1.6	1.8	2.1	1	1.5	1.1	1.3	<0.5	3.1	1.828	<0.5	1.1	<0.5	15.5	0.9	3.1	1.1	<0.1	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Maximum Detect	ND	ND	ND	1.3	1.1	1.6	1.8	2.1	1	1.5	1.1	1.3	ND	3.1	1.828	ND	1.1	ND	15.5	0.9	3.1	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.23	0.23	0.23	0.26	0.26	0.29	0.6	1.1	0.27	0.27	0.28	0.26	0.23	0.32	0.6	0.23	0.26	0.23	0.74	0.25	0.32	0.38	0.027	0.091	0.05	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	0.605	0.25	0.25	0.25	0.25	0.25	0.25	0.025	0.025	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Standard Deviation	0.058	0.058	0.058	0.19	0.16	0.23	0.23	0.32	0.13	0.22	0.15	0.19	0.058	0.49	0.26	0.058	0.16	0.058	2.7	0.13	0.49	0.62	0.0072	0.082	0	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
Number of Guideline Exceedances	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table B: Stage 1 Tower Soil Analytical Sumamry
Project Number: 54794
Project Name: Main Works DGA

	Organochlorine Pesticides																								
	4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	DDD	DDT	DDT+DDE+DDD (Sum of Total)	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	gamma-Chlordane	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	0.05	0.05	0.05		0.05	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		0.05	0.05	0.05	0.05	0.05	0.05	0.05	1.00
NEPM 2013 EIL - Urban Residential (site specific)										180														
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																								
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																								
NEPM 2013 Soil HIL B			10				90				600						20			10			500	30
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																								
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																								

Field_ID	LocCode	Sample Date	Sample Type	Lab Report																						
HA244-0.2-0.3	HA244-0.2-0.3	2018/07/30	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
HA251-0.2-0.3	HA251-0.2-0.3	2018/07/26	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
HA251-0-0.1	HA251-0-0.1	2018/07/26	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
HA252-0.55-0.65	HA252-0.55-0.65	2018/07/26	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
HA264_0-0.1	HA264_0-0.1	2018/09/18	Additional DGA - WC	618884	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
HA266_0.3-0.4	HA266_0.3-0.4	2018/09/18	Additional DGA - WC	618884	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
QA20180726-01	HA251-0-0.1	2018/07/26	FILL	197709	<0.1	<0.1	<0.2 [#15]	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
QA20180727-01	TP241 0.2-0.3	2018/07/27	VENM	197708	<0.1	<0.1	<0.2 [#15]	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
QA20180801-04	TP243 0-0.1	2018/08/01	FILL	198047	<0.1	<0.1	<0.2 [#16]	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-
QC20180726-01	HA251-0-0.1	2018/07/26	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
QC20180727-01	TP241 0.2-0.3	2018/07/27	VENM	610636	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
QC20180801-04	TP243 0-0.1	2018/08/06	FILL	611277	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
QC20180918-02	TP269_0.5-0.6	2018/09/18	Additional DGA - WC	618884	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
TP213 1.55-1.65	TP213	2018/07/26	VENM	610636	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP213-0.1-0.2C	TP213-0.1-0.2C	2018/07/26	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP214-0.2-03C	TP214-0.2-03C	2018/07/30	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP215-0.3-0.4C	TP215-0.3-0.4C	2018/07/30	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP215-0.5-0.6	TP215-0.5-0.6	2018/07/30	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP216-0.05-0.15C	TP216-0.05-0.15C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP218-0.1-0.2C	TP218-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP219-0.05-0.15C	TP219-0.05-0.15C	2018/07/30	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP220-0.1-0.2C	TP220-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP221_0.9-1.0	TP221_0.9-1.0	2018/08/02	VENM	611234	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP221-0.2-0.3C	TP221-0.2-0.3C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP223-0.2-0.3C	TP223-0.2-0.3C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP224-0.1-0.2C	TP224-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP225 0.4-0.5	TP225 0.4-0.5	2018/08/01	FILL	611277	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP225-0.1-0.2C	TP225-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP227-0.1-0.2C	TP227-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP228-0.1-0.2C	TP228-0.1-0.2C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP229-0.2-0.3	TP229-0.2-0.3	2018/07/28	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP229-0.3-0.4C	TP229-0.3-0.4C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP230-0.06-0.45C	TP230-0.06-0.45C	2018/07/28	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP231 0.5-0.6	TP231	2018/07/27	VENM	610636	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP232-0.2-03C	TP232-0.2-03C	2018/08/01	REC-AGG	611251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP233-0.1-0.3C	TP233-0.1-0.3C	2018/07/28	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP235 0.8-0.85	TP235	2018/07/27	VENM	610636	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP236-0.1-0.3C	TP236-0.1-0.3C	2018/07/28	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP236-0.2-0.3	TP236-0.2-0.3	2018/07/28	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP237-0.1-0.3C	TP237-0.1-0.3C	2018/07/28	REC-AGG	610632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP238-0.3-0.4	TP238-0.3-0.4	2018/07/26	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP239 0.3-0.4	TP239	2018/07/27	VENM	610636	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP240-0-0.05	TP240-0-0.05	2018/07/26	FILL	610482	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP241 0.2-0.3	TP241	2018/07/27	VENM	610636	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP243 0-0.1	TP243 0-0.1	2018/08/01	FILL	611277	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP249 0.4-0.5	TP249	2018/07/27	VENM	610636	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP258_0.45-0.55	TP258_0.45-0.55	2018/08/02	VENM	611234	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP260_0.2-0.3	TP260_0.2-0.3	2018/08/02	VENM	611234	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP261_0.3-0.4	TP261_0.3-0.4	2018/08/02	VENM	611234	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
TP268_0.4-0.5	TP268_0.4-0.5	2018/09/18	Additional DGA - WC	618884	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
TP269_0.5-0.6	TP269_0.5-0.6	2018/09/18	Additional DGA - WC	618884	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
TP272_0.3-0.5	TP272_0.3-0.5	2018/09/19	Additional DGA - WC	618884	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1
TP274_0.6-0.7	TP274_0.6-0.7	2018/09/19	Additional DGA - WC	618884	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1

Statistical Summary

Number of Results	34	34	34	34	3	34	31	34	34	34	34	34	34	34	34	3	34	34	31	34	34	34	34	31
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.2	<1
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.027	0.027	0.032	0.027	0.05	0.027	0.05	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.05	0.027	0.027	0.025	0.027	0.027	0.027	0.043	0.5
Median Concentration	0.025	0.025	0.025	0.025	0.05	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.5
Standard Deviation	0.0072	0.0072	0.022	0.0072	0	0.0072	0	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	0	0.0072	0.0072	0	0.0072	0.0072	0.0072	0.03	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C: Childcare Soil Analtyical Summary
Project Number: 54794
Project Name: Mains Works DGA

	Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEX					
	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Total)	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	2.00	0.40	1.00	1.00	1.00	0.10	1.00	1.00	20.00	20.00	50.00	50.00	50.00	50.00	100.00	100.00	50.00	50.00	20.00	20.00	0.10	0.10	0.10	0.10	0.20	0.30
NEPM 2013 EIL - Urban Residential (generic)	100		190	60	1100		270	770																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil															1300	5600		120		180	65	125	105			45
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine														1000	3500	10000			800							
NEPM 2013 Soil HIL A	100	20	100	6000	300	40	400	7400															160			
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																		280		50	0.7	NL	480			110
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																		NL		90	1	NL	NL			310
Sample Name	**Location**	**Sample Date**	**Lab Report**																								
HA265 0.1-0.2	HA265 0.1-0.2	2018/08/02	611277	12	<0.4	24	26	29	<0.1	8.8	87	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP264 0.4-0.5	TP264 0.4-0.5	2018/08/06	611277	6.8	<0.4	14	31	14	<0.1	12	62	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP264 0.8-0.85	TP264 0.8-0.85	2018/08/06	611277	11	<0.4	11	25	11	<0.1	<5	24	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP264-0.08-0.8	TP264-0.08-0.8	2018/08/06	611286	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP264-0.8-0.85	TP264-0.8-0.85	2018/08/06	611286	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP266 0-0.1	TP266 0-0.1	2018/08/06	611277	8.2	<0.4	18	27	38	<0.1	12	58	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
TP267 0.04-0.14	TP267 0.04-0.14	2018/08/06	611277	9.2	<0.4	23	23	40	<0.1	9.7	90	<20	<20	62	84	146	<50	120	<100	120	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
Statistical Summary																													
Number of Results				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Number of Detects				5	0	5	5	5	0	4	5	0	0	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0
Minimum Concentration				6.8	<0.4	11	23	11	<0.1	<5	24	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
Minimum Detect				6.8	ND	11	23	11	ND	8.8	24	ND	ND	62	84	146	ND	120	ND	120	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration				12	<0.4	24	31	40	<0.1	12	90	<20	<20	62	84	146	<50	120	<100	120	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
Maximum Detect				12	ND	24	31	40	ND	12	90	ND	ND	62	84	146	ND	120	ND	120	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration				9.4	0.2	18	26	26	0.05	9	64	10	10	32	37	49	25	64	50	64	25	10	10	0.05	0.05	0.05	0.05	0.1	0.15
Median Concentration				9.2	0.2	18	26	29	0.05	9.7	62	10	10	25	25	25	25	50	50	50	25	10	10	0.05	0.05	0.05	0.05	0.1	0.15
Standard Deviation				2.1	0	5.6	3	13	0	3.9	27	0	0	17	26	54	0	31	0	31	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances				0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)				0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C: Childcare Soil Analtyical Summary
Project Number: 54794
Project Name: Mains Works DGA

	Polycyclic Aromatic Hydrocarbons																						Chlorinated Benzenes	Polychlorinated Biphenyls							
	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(a)pyrene TEQ (WHO)	Benzo(b,j)fluoranthene	Benzo(b,k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Carcinogenic PAHs as B(a)P TEQ	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Total)	Phenanthrene	Pyrene	Hexachlorobenzene	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.10	0.10	0.10	0.10	0.05	0.50	0.50	0.50		0.50	0.20	0.10	0.50	0.10	0.10	0.10		0.10	0.10	0.10	0.05	0.10	0.10	0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NEPM 2013 EIL - Urban Residential (generic)																				170												
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil					0.7																											
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																
NEPM 2013 Soil HIL A						3	3	3									3				300			10								1
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																				5												
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																				NL												

Sample Name	Location	Sample Date	Lab Report																													
HA265 0.1-0.2	HA265 0.1-0.2	2018/08/02	611277	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP264 0.4-0.5	TP264 0.4-0.5	2018/08/06	611277	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP264 0.8-0.85	TP264 0.8-0.85	2018/08/06	611277	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP264-0.08-0.8	TP264-0.08-0.8	2018/08/06	611286	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP264-0.8-0.85	TP264-0.8-0.85	2018/08/06	611286	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP266 0-0.1	TP266 0-0.1	2018/08/06	611277	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	0.7	<1.21	<0.5	<0.5	<0.5	1.4	<0.5	0.7	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP267 0.04-0.14	TP267 0.04-0.14	2018/08/06	611277	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Statistical Summary

Number of Results	5	5	5	5	5	5	5	5	0	5	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Number of Detects	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	99999	<0.5	99999	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Minimum Detect	ND	ND	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND	ND	ND	ND	0.7	ND	ND	ND	ND	1.4	ND	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	0	<0.5	0	<0.5	<0.5	<0.5	<0.5	0.7	<1.21	<0.5	<0.5	<0.5	1.4	<0.5	0.7	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Maximum Detect	ND	ND	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND	ND	ND	ND	0.7	ND	ND	ND	ND	1.4	ND	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2		0.25		0.25	0.25	0.25	0.25	0.34	0.61	0.25	0.25	0.25	0.48	0.25	0.34	0.025	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Median Concentration	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2		0.25		0.25	0.25	0.25	0.25	0.25	0.605	0.25	0.25	0.25	0.25	0.25	0.25	0.025	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Standard Deviation	0	0	0	0	0	0	0	0		0		0	0	0	0	0.2	0	0	0	0	0.51	0	0.2	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C: Childcare Soil Analtyical Summary
Project Number: 54794
Project Name: Mains Works DGA

	Organochlorine Pesticides																								Other	
	4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	DDD	DDT	DDT+DDE+DDD (Sum of Total)	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	gamma-Chlordane	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	% Moisture 103oC	Moisture
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%
EQL	0.05	0.05	0.05	0.05	0.10	0.05	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1.00	1.00	0.10
NEPM 2013 EIL - Urban Residential (generic)										180																
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																										
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																										
NEPM 2013 Soil HIL A			6				50				240						10			6			300	20		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																										
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 1 to <2m																										
Sample Name	**Location**	**Sample Date**	**Lab Report**																							
HA265 0.1-0.2	HA265 0.1-0.2	2018/08/02	611277	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	9.2	-
TP264 0.4-0.5	TP264 0.4-0.5	2018/08/06	611277	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	8.6	-
TP264 0.8-0.85	TP264 0.8-0.85	2018/08/06	611277	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	15	-
TP264-0.08-0.8	TP264-0.08-0.8	2018/08/06	611286	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP264-0.8-0.85	TP264-0.8-0.85	2018/08/06	611286	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP266 0-0.1	TP266 0-0.1	2018/08/06	611277	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	16	-
TP267 0.04-0.14	TP267 0.04-0.14	2018/08/06	611277	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	12	-
Statistical Summary																										
Number of Results	5	5	5	5	0	5	5	5	5	5	5	5	5	5	5	0	5	5	5	5	5	5	5	5	5	0
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
Minimum Concentration	<0.05	<0.05	<0.05	<0.05	99999	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	99999	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	8.6	99999
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.6	ND
Maximum Concentration	<0.05	<0.05	<0.05	<0.05	0	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	16	0
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	ND
Average Concentration	0.025	0.025	0.025	0.025		0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025		0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.5	12	
Median Concentration	0.025	0.025	0.025	0.025		0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025		0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.5	12	
Standard Deviation	0	0	0	0		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	3.3	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table D1: Soil Chemical Waste Summary

					Metals & Metalloids								Polycyclic Aromatic Hydrocarbons																				
					Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[a]pyrene TEQ (lower bound)*	Benzo[a]pyrene TEQ (medium bound)*	Benzo[a]pyrene TEQ (upper bound)*	Benzo[a]pyrene TEQ (WHO)	Benzo[b,j]fluoranthene	Benzo[b,k]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Carcinogenic PAHs as B[a]P TEQ	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Total)	Phenanthrene	Pyrene	Total Positive PAHs
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					2.00	0.40	1.00	1.00	1.00	0.10	1.00	1.00	0.10	0.10	0.10	0.10	0.05	0.50	0.50	0.50		0.50	0.20	0.10	0.50	0.10	0.10	0.10		0.10	0.10	0.10	0.05	0.10	0.10	
NSW EPA 2014 General Solid Waste (No Leaching)					100	20			100	4	40						0.8																		50
NSW EPA 2014 General Solid Waste (with leached)					**500**	**100**			**1500**	**50**	**1050**						**10**																		**50**
NSW EPA 2014 Restricted Solid Waste (No Leaching)					400	80			400	16	160						3.2																		
NSW EPA 2014 Restricted Solid Waste (with leached)					*2000*	*400*			*6000*	*200*	*4200*						*23*																		
Sample Name	**Location**	**Sample Date**	**Lab_Report**																																
BH10 0.04-0.1	-	EIS 2017A	-		4	0.4	18	36	12	0.1	21	43	-	-	-	-	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11 0.05-0.15	-	EIS 2017A	-		4	0.4	11	25	15	0.1	9	38	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12 0.5-0.95	-	EIS 2017A	-		5	0.4	16	26	14	0.1	22	31	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13 0.04-0.1	-	EIS 2017A	-		4	0.4	15	32	8	0.1	26	38	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH131 0.1-0.3	-	EIS 2017B	-		<4	<0.4	10	59	3	<0.1	91	33	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH131 0.6-0.9	-	EIS 2017B	-		<4	<0.4	5	12	7	<0.1	4	13	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH132 0.1-0.3	-	EIS 2017B	-		11	<0.4	23	22	16	<0.1	20	19	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH132 0.7-0.95	-	EIS 2017B	-		12	<0.4	10	20	9	<0.1	5	17	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH132 4.3-4.5	-	EIS 2017B	-		6	<0.4	8	37	12	<0.1	5	28	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH133 0.0-0.3	-	EIS 2017B	-		<4	<0.4	38	20	20	<0.1	35	42	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH134 0.0-0.1	-	EIS 2017B	-		5	<0.4	14	23	16	<0.1	10	41	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH134 0.2-0.5	-	EIS 2017B	-		5	<0.4	14	18	13	<0.1	9	31	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH135 0.0-0.3	-	EIS 2017B	-		4	<0.4	26	33	40	<0.1	16	90	-	-	-	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH136 0.0-0.1	-	EIS 2017B	-		10	<0.4	23	30	38	<0.1	15	79	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH136 0.2-0.4	-	EIS 2017B	-		5	<0.4	16	16	15	<0.1	4	15	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH137 0.0-0.2	-	EIS 2017B	-		7	<0.4	20	27	26	<0.1	13	100	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH138 0.0-0.2	-	EIS 2017B	-		<4	<0.4	11	16	30	<0.1	8	78	-	-	-	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH139 0.1-0.3	-	EIS 2017B	-		<4	<0.4	12	31	24	<0.1	24	40	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH139 1.5-1.8	-	EIS 2017B	-		4	<0.4	28	21	14	<0.1	28	30	-	-	-	-	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH139 3.0-3.3	-	EIS 2017B	-		14	<0.4	29	14	26	<0.1	5	24	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14 0.05-0.15	-	EIS 2017A	-		4	0.4	25	32	13	0.1	17	46	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH140 0.1-0.3	-	EIS 2017B	-		4	<0.4	11	8	17	<0.1	6	29	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH140 1.1-1.3	-	EIS 2017B	-		8	<0.4	21	17	21	<0.1	6	19	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH140 5.8-6.0	-	EIS 2017B	-		13	<0.4	12	43	15	<0.1	48	130	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH141 0.0-0.1	-	EIS 2017B	-		5	<0.4	14	30	13	<0.1	10	42	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH142 0.0-0.2	-	EIS 2017B	-		<4	<0.4	10	25	33	<0.1	13	74	-	-	-	-	0.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH142 0.2-0.4	-	EIS 2017B	-		<4	<0.4	7	10	5	<0.1	2	9	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH143 0.1-0.3	-	EIS 2017B	-		<4	<0.4	7	18	12	<0.1	8	28	-	-	-	-	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH143 0.9-1.2	-	EIS 2017B	-		5	<0.4	8	13	8	<0.1	3	14	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH143 4.3-4.5	-	EIS 2017B	-		9	<0.4	22	36	13	<0.1	25	84	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH144 0.1-0.3	-	EIS 2017B	-		<4	<0.4	89	32	6	<0.1	96	47	-	-	-	-	0.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH145 0.1-0.3	-	EIS 2017B	-		<4	<0.4	5	5	10	<0.1	6	21	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH145 0.75-0.95	-	EIS 2017B	-		<4	<0.4	10	10	7	<0.1	3	11	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH15 0.05-0.10	-	EIS 2017A	-		4	0.4	67	48	3	0.1	69	39	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16 0.5-0.9	-	EIS 2017A	-		4	0.4	11	18	9	0.1	3	15	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH201 0.5-0.95	-	EIS 2017B	-		<4	<0.4	12	26	24	<0.1	9	63	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH201 1.5-1.95	-	EIS 2017B	-		4	<0.4	11	38	210	<0.1	9	36	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH202 0.05-0.15	-	EIS 2017B	-		<4	<0.4	19	35	15	<0.1	14	49	-	-	-	-	0.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH202 0.5-0.6	-	EIS 2017B	-		<4	<0.4	8	12	10	<0.1	2	10	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA244-0.2-0.3	-	2018/07/30	610482		8.6	<0.4	23	37	24	<0.1	40	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
HA251-0.2-0.3	-	2018/07/26	610482		5.9	<0.4	16	22	21	<0.1	16	95	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
HA251-0-0.1	-	2018/07/26	610482		5	<0.4	12	20	19	<0.1	9	61	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
HA252-0.55-0.65	-	2018/07/26	610482		4.4	<0.4	28	46	<5	<0.1	150	80	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
HA264_0-0.1	-	2018/09/18	618884		5.5	<0.4	17	28	13	<0.1	19	240	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
HA265 0.1-0.2	-	2018/08/02	611277		12	<0.4	24	26	29	<0.1	8.8	87	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
HA266_0.3-0.4	-	2018/09/18	618884		4.4	<0.4	12	21	18	<0.1	7.2	69	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
QA20180726-01	HA251-0-0.1	2018/07/26	197709		<4	<0.4	22	17	15	<0.1	17	72	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	-	-	<0.1	-	<0.1	<0.1	<0.1	<0.172	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.05
QA2018077-01	TP241 0.2-0.3	2018/07/27	197708		<4	<0.4	14	13	13	<0.1	7	25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	-	-	<0.1	-	<0.1	<0.1	<0.1	<0.172	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.05
QA20180801-04	TP243 0-0.1	2018/08/01	198047		<4	<0.4	10	51	22	<0.1	7	92	<0.1	<0.1	<0.1	0.1	0.1	<0.5	<0.5	<0.5	-	-	-	0.2	-	0.1	<0.1	0.1	0.173	<0.1	0.1	<0.1	-	<0.1	0.1	1.1
QA20180918-02	QA20180918-02	2018/09/18	14927		6	<0.4	16	15	16	<0.1	5	25	<0.1	<0.1	<0.1	<0.1	<0.05	-	0.1	0.2	0	-	<0.2	<0.1	-	<0.1	<0.1	<0.1	<0.172	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	-
QC20180726-01	HA251-0-0.1	2018/07/26	610482		4.8	<0.4	12	20	19	<0.1	8.4	78	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
QC20180727-01	TP241 0.2-0.3	2018/07/27	610636		6.2	<0.4	24	23	15	<0.1	6.7	33	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
QC20180801-04	TP243 0-0.1	2018/08/06	611277		3.4	<0.4	13	42	22	<0.1	7.6	95	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
QC20180918-02	TP269 0.5-0.6	2018/09/18	618884		9.2	<0.4	28	23	23	<0.1	9.9	49	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP213 1.55-1.65	-	2018/07/26	610636		8.5	<0.4	23	14	17	<0.1	<5	18	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP213-0.1-0.2C	-	2018/07/26	610632		2.8	<0.4	20	37	53	<0.1	21	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP214-0.2-03C	-	2018/07/30	610632		2.8	<0.4	31	34	34	<0.1	40	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP215-0.3-0.4C	-	2018/07/30	610632		3.2	<0.4	20	28	27	<0.1	20	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP215-0.5-0.6	-	2018/07/30	610482		22	<0.4	32	20	24	<0.1	5.9	26	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP216-0.05-0.15C	-	2018/08/01	611251		3.3	<0.4	21	37	47	<0.1	23	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP218-0.1-0.2C	-	2018/08/01	611251		3.4	<0.4	21	43	28	<0.1	26	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP219-0.05-0.15C	-	2018/07/30	610632		2.3	<0.4	19	40	62	<0.1	27	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP220-0.1-0.2C	-	2018/08/01	611251		2.5	<0.4	18	30	39	0.1	33	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP221_0.9-1.0	-	2018/08/02	611234		10	<0.4	18	23	13	<0.1	8.2	32	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP221-0.2-0.3C	-	2018/08/01	611251		3.2	<0.4	81	42	15	<0.1	92	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP223-0.2-0.3C	-	2018/08/01	611251		2.5	<0.4	33	30	16	<0.1	51	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP224-0.1-0.2C	-	2018/08/01	611251		3.3	<0.4	26	26	39	0.2	18	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP225 0.4-0.5	-	2018/08/01	611277		14	<0.4	35	25	28	<0.1	7.8	38	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP225-0.1-0.2C	-	2018/08/01	611251		2.7	<0.4	19	19	20	<0.1	21	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP227-0.1-0.2C	-	2018/08/01	611251		3	<0.4	24	36	19	<0.1	29	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP228-0.1-0.2C	-	2018/08/01	611251		4.9	<0.4	27	34	19	<0.1	18	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP229-0.2-0.3	-	2018/07/28	610482		2.1	<0.4	23	36	15	<0.1	35	57	<0.5	<0.5	<0.5	1.3	1.1	1.6	1.8	2.1	-	1	-	1.5	1.1	1.3	<0.5	3.1	1.828	<0.5	1.1	<0.5	15.5	0.9	3.1	-
TP229-0.3-0.4C	-	2018/08/01	611251		3.3	<0.4	54	40	18	<0.1	81	96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP230-0.06-0.45C	-	2018/07/28	610632		2.3	<0.4	66	36	12	<0.1	87	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP231 0.5-0.6	-	2018/07/27	610636		11	<0.4	23	19	16	<0.1	<5	25	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP232-0.2-03C	-	2018/08/01	611251		2.8	<0.4	70	40	14	<0.1	110	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP233-0.1-0.3C	-	2018/07/28	610632		4.6	<0.4	39	33	22	<0.1	37	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP235 0.8-0.85	-	2018/07/27	610636		7.2	<0.4	13	14	13	<0.1	<5	33	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP236-0.1-0.3C	-	2018/07/28	610632		2.3	<0.4	47	41	14	<0.1	54	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP236-0.2-0.3	-	2018/07/28	610482		2.1	<0.4	94	30	8.6	<0.1	100	59	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP237-0.1-0.3C	-	2018/07/28	610632		2.5	<0.4	48	26	14	<0.1	53	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP238-0.3-0.4	-	2018/07/26	610482		12	<0.4	25	17	23	<0.1	9.6	40	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP239 0.3-0.4	-	2018/07/27	610636		5.8	<0.4	22	18	15	<0.1	8.3	29	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP240-0-0.05	-	2018/07/26	610482		3.8	<0.4	14	29	19	<0.1	6.7	70	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP241 0.2-0.3	-	2018/07/27	610636		6	<0.4	23	21	15	<0.1	6.6	31	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP243 0-0.1	-	2018/08/01	611277		<2	<0.4	7.2	25	14	<0.1	6.2	52	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP249 0.4-0.5	-	2018/07/27	610636		7.4	<0.4	23	20	15	<0.1	6.9	31	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP258_0.45-0.55	-	2018/08/02	611234		14	<0.4	27	18	34	<0.1	7.8	38	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP260_0.2-0.3	-	2018/08/02	611234		16	<0.4	42	17	29	<0.1	6.7	28	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP261_0.3-0.4	-	2018/08/02	611234		6.9	<0.4	11	26	31	<0.1	6.2	31	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP264 0.4-0.5	-	2018/08/06	611277		6.8	<0.4	14	31	14	<0.1	12	62	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP264 0.8-0.85	-	2018/08/06	611277		11	<0.4	11	25	11	<0.1	45	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP266 0-0.1	-	2018/08/06	611277		8.2	<0.4	18	27	38	<0.1	12	58	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	0.7	<1.21	<0.5	<0.5	<0.5	1.4	<0.5	0.7	-
TP267 0.04-0.14	-	2018/08/06	611277		9.2	<0.4	23	23	40	<0.1	9.7	90	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP267_0.6-0.7	-	2018/09/18	618884		5.6	<0.4	21	20	22	<0.1	9.4	36	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP268_0.4-0.5	-	2018/09/18	618884		3.2	<0.4	17	15	13	<0.1	7.8	41	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP269_0.5-0.6	-	2018/09/18	618884		13	<0.4	31	25	26	<0.1	10	47	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
TP272_0.3-0.5	-	2018/09/19	618884		5.1	<0.4	31	37	20	<0.1	76	76	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	<0.5	-	<0.5	<0.5	<0.5	<0.5

Table D1: Soil Chemical Waste Summary

	PAH/Phenol		TPHs (NEPC 1999)					PC 1999) - S	BTEX						Polychlorinated Biphenyls							
Scheduled Chemicals Combined (NSW 2014)	PAH Combined (NSW 2014)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	C10 - C36 Fraction (Total) (SG)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		20.00	20.00	50.00	50.00	50.00		0.10	0.10	0.10	0.10	0.20	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
0-0|50-0|50	200	650				10000		10	600	288			1000								50-0|50-0|50
0-0|50-0|50	**200**	**650**				**10000**		**18**	**1080**	**518**			**1800**								**50-0|50-0|50**
50-0|50-0	800	2600				40000		40	2400	1152			4000								50-0|50-0
50-0|50-0	*800*	*2600*				*40000*		*72*	*4320*	*2073*			*7200*								*50-0|50-0*
-	24.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
-	4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
-	4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	0.26	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	0.26	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	8.7	<25	-	<100	270	-	270	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	0.07	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	8.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
-	0.2	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	0.39	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	0.56	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	1.18	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	1	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	-
-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
-	1.4	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	9.39	<25	-	<100	120	-	120	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
-	<0.05	<25	-	<100	<100	-	<250	<0.2	<1	<0.5	-	-	<3	-	-	-	-	-	-	-	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	120	110	230	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	120	210	330	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.9	<1.35	<25	<50	<100	<100	-	-	<0.2	<1	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.9	<1.35	<25	<50	<100	<100	-	-	<0.2	<1	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.9	1.15	<25	<50	<100	<100	-	-	<0.2	<1	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.9	<1.35	<25	<50	<100	<100	<50	-	<0.2	<1	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	59	84	143	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	16	<20	<20	90	190	280	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	<7.5	<40	<20	<50	110	110	-	<0.2	<0.2	<0.2	<0.2	<0.4	<0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	130	190	320	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	81	81	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	4.65	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	62	84	146	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.55	<7.5	<20	<20	98	170	268	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<0.55	<7.5	<20	<20	<50	<50	<50	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Table D1: Soil Chemical Waste Summary

Organochlorine Pesticides																							
4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	DDD	DDT	DDT+DDE+DDD (Sum of Total)	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	gamma-Chlordane	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.05	0.05	0.05	0.05	0.10	0.05	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1.00
-0												60	60	60									
-0												**108**	**108**	**108**									
												240	240	240									
												432	*432*	*432*									
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table D2: TCLP Data
Project Number: 54794
Project Name: Main Works DGA

	Metals & Metalloids		Polycyclic Aromatic Hydrocarbons	Ionic Balance			
	Lead	Nickel	Benzo(a)pyrene	pH (TCLP - HCl addition)	pH (TCLP - initial)	pH (TCLP - off)	pH (Leachate fluid)
		mg/L	mg/L	ph Units	ph Units	ph Units	ph Units
EQL	0.03	0.01	0.00	0.10	0.10	0.10	0.10
NSW EPA 2014 General Solid Waste (leached)	2	2	0.04				
Field_ID **Sampled Date** **Matrix_Description**							
BH131 0.1-0.3 EIS 2017B -	-	0.02	-	-	-	-	-
BH139 0.1-0.3 EIS 2017B -	-	-	<0.001	-	-	-	-
BH140 5.8-6.0 EIS 2017B -	-	0.02	-	-	-	-	-
BH144 0.1-0.3 EIS 2017B -	-	0.04	-	-	-	-	-
BH201 0.5-1.95 EIS 2017B -	<0.03	0.04	-	-	-	-	-
HA252-0.55-0.65 26/07/2018 -	-	<0.01	-	1.5	7.8	5.1	5.1
TP221-0.2-0.3C 26/07/2018 -	-	<0.05	-	1.9	9.8	6.2	-
TP223-0.2-0.3C 26/07/2018 -	-	<0.05	-	1.8	9.7	6	-
TP229-0.2-0.3 26/07/2018 -	-	-	<0.001	2.4	10	9.3	5.1
TP229-0.3-0.4C 26/07/2018 -	-	<0.05	-	1.9	9.8	6.8	-
TP230-0.06-0.45C 26/07/2018 -	-	<0.05	-	1.9	8.6	5.8	-
TP232-0.2-03C 26/07/2018 -	-	0.06	-	1.9	9.6	5.6	-
TP236-0.1-0.3C 26/07/2018 -	-	<0.05	-	1.9	9.7	6.5	-
TP236-0.2-0.3 26/07/2018 -	-	0.03	-	1.9	9.7	5.5	5.1
TP237-0.1-0.3C 26/07/2018 -	-	<0.05	-	1.9	9.7	6.6	-
Statistical Summary							
Number of Results	9	1		10	10	10	4
Number of Detects	2	0		10	10	10	4
Minimum Concentration	<0.01	<0.001		1.5	7.8	5.1	5.1
Minimum Detect	0.03	ND		1.5	7.8	5.1	5.1
Maximum Concentration	0.06	<0.001		2.4	10	9.3	5.1
Maximum Detect	0.06	ND		2.4	10	9.3	5.1
Average Concentration	0.027			1.9	9.4	6.3	5.1
Median Concentration	0.025	0.0005		1.9	9.7	6.1	5.1
Standard Deviation	0.014			0.22	0.69	1.2	0
Number of Guideline Exceedances	0	0		0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0		0	0	0	0

Table E: Grounwater Analytical Summary
Project Number: 54794
Project Name: Nepean Hospital - Main Works

			Metals & Metalloids								Non-Metallic Inorganics								Chlorinated Alkanes																			
			Arsenic (Total) (Filtered)	Cadmium (Filtered)	Chromium (Total) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Inorganic) (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Ammonia (Filtered)	Nitrate & Nitrite (as N)	Nitrate (as N) (Filtered)	Nitrite (as N) (Filtered)	NOx as N in water	Phosphate total (as P)	Total Kjeldahl Nitrogen (as N)	Total Nitrogen (as N)	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.05				0.05	0.10	0.20	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NEPM 2013 GIL - Drinking Water			0.01	0.002		2	0.01	0.001	0.02																	0.003					0.003					0.004	
NEPM 2013 GIL - Fresh Waters				0.02120307	0.073463	0.120356	2.640048	0.00006	0.945657	0.68775	2.47	0.7											6.5															
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion - Clay 4 to <8m																																					
Sample ID	**Sample Date**	**Lab Report Number**																																			
MW12 (Primary)	2018/07/25	609701	<0.001	<0.0002	<0.001	0.002	<0.001	<0.0001	0.017	0.006	-	<0.05	-	-	-	<0.05	0.3	0.3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
QC01 (Duplicate)	2018/07/25	609701	<0.001	<0.0002	<0.001	0.003	<0.001	<0.0001	0.019	0.009	-	0.26	-	-	-	<0.05	<0.2	0.3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
QA01 (Triplicate)	2018/07/25	14332	<0.001	<0.0001	<0.001	0.003	<0.001	<0.00005	0.018	0.009	0.16	-	0.008	<0.005	0.008	0.1	0.2	0.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	-	<0.01
MW132	2018/07/25	609701	0.002	0.0003	0.003	0.029	0.025	<0.0001	0.34	0.82	-	<0.05	-	-	-	0.19	0.5	0.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW140	2018/07/25	609701	0.002	0.0006	0.004	0.019	0.031	<0.0001	0.25	0.66	-	<0.05	-	-	-	0.18	0.6	0.6	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW143	2018/07/25	609701	<0.001	0.0002	<0.001	<0.001	<0.001	<0.0001	0.05	0.027	-	<0.05	-	-	-	0.06	0.3	0.3	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table E: Grounwater Analytical Summary
Project Number: 54794
Project Name: Nepean Hospital - Main Works

			Chlorinated Alkenes											Trihalomethanes				TPHs (NEPC 1999)					TRHs (NEPC 2013)						BTEX					
			1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.10	0.10	0.10	0.05	0.10	0.10	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
NEPM 2013 GIL - Drinking Water			0.03							0.05	0.00	0.00	0.00	0.0003	0.25	0.25	0.25	0.25												0.001	0.3	0.8			0.6
NEPM 2013 GIL - Fresh Waters																														0.95			0.35		
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion - Clay 4 to <8m																											NL		NL	5	NL	NL			NL
Sample ID	**Sample Date**	**Lab Report Number**																																	
MW12 (Primary)	2018/07/25	609701	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003
QC01 (Duplicate)	2018/07/25	609701	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003
QA01 (Triplicate)	2018/07/25	14332	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.1	<0.1	-	<0.05	<0.1	<0.1	<0.05	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001	<0.002	-
MW132	2018/07/25	609701	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003
MW140	2018/07/25	609701	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003
MW143	2018/07/25	609701	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003

Table E: Grounwater Analytical Summary
Project Number: 54794
Project Name: Nepean Hospital - Main Works

			Polycyclic Aromatic Hydrocarbons																Monocyclic Aromatic Hydrocarbons									
			Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	PAHs (Total)	Pyrene	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Bromobenzene	Isopropylbenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	Tert-butyl benzene
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00				0.00	
NEPM 2013 GIL - Drinking Water							0.00001																					0.03	
NEPM 2013 GIL - Fresh Waters																0.016													
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion - Clay 4 to <8m																NL													
Sample ID	**Sample Date**	**Lab Report Number**																											
MW12 (Primary)	2018/07/25	609701	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-
QC01 (Duplicate)	2018/07/25	609701	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-
QA01 (Triplicate)	2018/07/25	14332	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001	0[#1]	<0.00001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW132	2018/07/25	609701	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-
MW140	2018/07/25	609701	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-
MW143	2018/07/25	609701	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-

Table E: Grounwater Analytical Summary
Project Number: 54794
Project Name: Nepean Hospital - Main Works

			Miscellaneous Hydrocarbons							Chlorinated Benzenes						Solvents	Organic Sulfur Compounds	Miscellaneous Industrial Chemicals	Major Cations		Ionic Balance
			1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Cyclohexane	Dibromomethane	Iodomethane	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	2-Propanone (Acetone)	Carbon disulfide	Hexachlorobutadiene	Calcium	Magnesium	Hardness as CaCO3
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.00	0.00	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	1.00	0.00		0.50	0.50	5.00
NEPM 2013 GIL - Drinking Water						0.001				0.03	0.03	1.5		0.04	0.3			0.0007			
NEPM 2013 GIL - Fresh Waters										0.003	0.085	0.16	0.26	0.06							
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion - Clay 4 to <8m																					
Sample ID	**Sample Date**	**Lab Report Number**																			
MW12 (Primary)	2018/07/25	609701	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<1	<0.001	-	380	980	5000
QC01 (Duplicate)	2018/07/25	609701	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<1	<0.001	-	480	1200	6300
QA01 (Triplicate)	2018/07/25	14332	<0.001	-	-	<0.01	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	380	920	-
MW132	2018/07/25	609701	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<1	<0.001	-	56	910	3900
MW140	2018/07/25	609701	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<1	<0.001	-	90	1200	5300
MW143	2018/07/25	609701	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<1	<0.001	-	390	1700	7800

Table F: Groundwater Gauging and Quality Paramaters
Project Number: 54794
Project Name: Main Works, Nepean Hospital

Well ID	Date Measured	TOC	Depth to Water	Standing Water Level	Dissolved Oxygen	Electrical Conductivity	TDS	Redox Potential	pH	Temperature	Comments				
		m AHD	m BTOC	m AHD	(ppm)	(mS/cm)	(ppm)	(mV)		(oC)	Odour	Colour	Turbidity	Sheen	Other
MW12	2018/07/25	47.56	2.34	45.215	1.01	23.80	14.28	24	6.48	20.9	None observed	Grey	Moderate	None observed	Duplicate and Triplicate Collected
MW132	2018/07/25	49.17	3.84	45.330	6.43	23.27	13.96	267	4.18	22.8	None observed	Colourless	Low	None observed	-
MW140	2018/07/25	48.79	1.83	46.960	3.51	28.14	16.88	244	4.32	21.6	None observed	Colourless	Low	None observed	-
MW143	2018/07/25	49.14	3.35	45.788	3.63	26.64	15.98	28	6.15	22.8	None observed	Colourless	Low	None observed	-

Notes:
ID = identification
mg/L = milligrams per litre
L = litres
mS/cm = millisiemen per centimetre
mV = millivolts
^{o}C = degrees Celsius
TDS = based on 0.6 conversion factor from electrical conductivity

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Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Mitchell Hodgins	Joanne Rosner	Joanne Rosner	Draft for Client Review	2018/10/31
0	Mitchell Hodgins	Joanne Rosner	Joanne Rosner		2018/11/09
1	Mitchell Hodgins	Joanne Rosner	Joanne Rosner		2019/04/16
2	Mitchell Hodgins	Joanne Rosner	Joanne Rosner		2020/03/27
3	Mitchell Hodgins	Joanne Rosner	Joanne Rosner		2021/02/05

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12. Heritage Subplan

12.1 Scope

This Plan addresses Heritage management (Aboriginal and Non- Aboriginal heritage) on the project and the management of impacts to the environment and/or community. Activities conducted on the project that have the potential to impact heritage values are captured in Table 7.

Table 7 Heritage hazards and risks

Project Activity	Environmental Hazard	Environmental Risk
Excavation / Ground disturbance	Unexpected discovery	Damage to heritage items
Plant and machinery operation	Impact on heritage items Entrance to heritage areas	Breach of legislation Damage to heritage

The EIS concluded that the Project would not adversely impact on any heritage items or places of significance. The Project is located on the Hospital campus which does not contain any heritage items nor is it located within a heritage conservation area. No heritage structures are to be impacted.

There are number of local heritage items in the vicinity of the proposed development, namely:

- Penrith General Cemetery (item no. 97) - bounded by Copeland and Phillips Streets, Richmond Road and Cox Avenue to the north east of the site.
- weatherboard cottage (item no. 175) located at 71 Parker Street.
- “Kevin brae”, Federation house (item no. 854) - located at 142 High Street.

Standard stop work procedures would apply should heritage items be suspected or found during construction activities. Should unanticipated relics be discovered during the Project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic. Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977*. Relics cannot be disturbed except with a permit or exception/exemption notification.

12.2 Plan objectives

Based on the requirements defined above, the findings of project risk management processes and the potential impacts to the community, the following targets have been set. Any deviation from the targets will result in Project Management immediately implementing corrective actions:

Table 8 Heritage performance objectives

Metric/Measure	Objective	Timeframe	Accountability
Incidents of damage to heritage items, places or values	Zero	Duration of Project	Project Manager
No complaints from the Regulators or traditional owners as a result of the works undertaken	Zero	Duration of Project	Project Manager

12.3 Project Compliance Requirements

12.3.1 Conditions of Approval

Conditions of approval that specifically address the management of heritage are captured in Table 9.

Table 9 Heritage Conditions of Approval

Reference	Relevant Condition
SSD B20 (h)	An unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure;
SSD C32	In the event that surface disturbance identifies a new Aboriginal object, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the objects. The site is to be registered in the Aboriginal Heritage Information Management

Reference	Relevant Condition
	System (AHIMS) which is managed by OEH and the management outcome for the site included in the information provided to AHIMS. The Applicant must consult with the Aboriginal community representatives, the archaeologists and OEH to develop and implement management strategies for all objects/sites. Works shall only recommence with the written approval of OEH.
SSD C33	If any unexpected archaeological relics are uncovered during the work, then all works must cease immediately in that area and the OEH Heritage Division contacted. Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area. Works may only recommence with the written approval of Heritage Division of the OEH.

12.4 Controls Used to Manage Heritage

Controls that are adequate to manage Heritage and to reduce risk to the lowest acceptable rating achievable are implemented before any relevant works commence. Elimination of the hazard is the first preference of control, followed by engineering, then administrative controls. Controls used on this project are listed in Table 10.

Table 10 Heritage controls

Control	Accountability
Ground disturbance must not take place until a Land Disturbance Permit has been authorised.	Project Environmental Representative
If an object or item is discovered that may be suspected of potentially be considered of heritage significance (either Aboriginal or Non-Aboriginal), work must cease immediately, and the Supervisor and Project Environmental representative notified. No Works will be allowed to continue until approval has been received from the project Environmental Representative. All works must cease immediately in that area and the OEH Heritage Division contacted. Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area. Works may only recommence with the written approval of Heritage Division of the OEH.	All
All Personnel will undertake a Site Induction which includes management of heritage items, (both Aboriginal and non-Aboriginal) and prevention of damage.	Project Manager
All necessary approvals will be obtained prior to commencing any works in areas of known or potential heritage items.	Project Manager
Work will cease upon the discovery of any object which may be a heritage item within the meaning of the relevant legislation, including likely human remains. No works will be allowed to continue until a permit or clearance has been received from the relevant authority.	All
A suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of suspected Aboriginal objects.	Project Manager
Applicant must consult with the Aboriginal community representatives, the archaeologists and OEH to develop and implement management strategies for all objects/sites. Works shall only recommence with the written approval of OEH.	Project Manager
Depending on the possible significance of non-Aboriginal relics, an archaeological assessment and management strategy may be required before further works can continue in that area. Works may only recommence with the written approval of Heritage Division of the OEH.	Project Manager

12.5 Unexpected finds procedure

If surface disturbance identifies a new Aboriginal item/object or unexpected archaeological relic, all works must halt in the immediate area to prevent any further impacts.

Immediately following halt of works the Supervisor, Project Manager and Project Environment Representative will be notified of the discovery and commence relevant notifications in accordance with the incident management procedure with the client.

For Aboriginal items / objects, a suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the objects. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by OEH and the management outcome for the site included in the information provided to AHIMS.

For non-Aboriginal items, the OEH Heritage Division will be contacted for direction and advice. Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area.

The archaeologist must consult with the Aboriginal community representatives (where required) and OEH to develop and implement management strategies for all objects/sites.

Works shall only recommence with the written approval of OEH.

12.6 Monitoring

Heritage monitoring will be restricted to unexpected discoveries during construction. Site personnel will be educated in the requirements to notify and stop working in the event of a potential unexpected find. The Project Environment Representative will undertake routing inspections which will include the review of site activities to identify potential non-compliances with the unexpected finds procedure.

Where monitoring determines non-compliance to be a risk or to have occurred, an incident report and corrective actions are raised in the Synergy.

Monitoring and analysis of data will be carried out by the Project Environmental Representative during construction as part of the routine inspections. Evidence of competence must be retained.

It is the accountability of the Project Environmental Representative to ensure all monitoring is performed according to these requirements.

13. Flora and Fauna Subplan

13.1 Scope

This Plan addresses flora and fauna management on the Project and the management of impacts to the environment and/or community.

13.2 Plan objectives

Based on the requirements of the Project approval and the findings of project risk management processes, the performance targets in Table 11 have been set. Any deviation from the targets will result in Project Management immediately implementing corrective actions.

Table 11 Flora and fauna performance objectives

Metric/Measure	Objective	Timeframe	Accountability
Number of native fauna injured through construction activities	Zero	Construction period	Project Manager
Tree protection measures to be in place	No Nonconformances	Construction period	Project Manager
Number of actions taken by regulators and/or client	Zero	Construction period	Project Manager

13.3 Project Compliance Requirements

13.3.1 Conditions of Approval

Conditions of approval which set limits and/or specify requirements relating to fauna or flora are stated in Table 16.

Table 12 Flora and fauna Conditions of Approval

Condition of Approval	Limit/Requirement
C25	For the duration of the construction works: (a) street trees must not be trimmed or removed unless it forms a part of the development consent or prior written approval from Council is obtained or is required in an emergency to avoid the loss of life or damage to property;" (b) any tree on the footpath, which is damaged or removed during construction due to an emergency, must be replaced, to the satisfaction of Council; (c) all trees on the site that are not approved for removal must be suitably protected during construction as per recommendations of the Arboricultural Development Assessment Report prepared by Moore Trees Arboricultural Services dated 26/11/2018; and (d) if access to the area within any protective barrier is required during the works, it must be carried out under the supervision of a qualified arborist. Alternative tree protection measures must be installed, as required. The removal of tree protection measures, following completion of the works, must be carried out under the supervision of a qualified arborist and must avoid both direct mechanical injury to the structure of the tree and soil compaction within the canopy or the limit of the former protective fencing, whichever is the greater.

13.4 Controls Used to Manage Flora and Fauna

Controls to manage flora and fauna risks and to reduce risk to the lowest acceptable rating achievable are implemented before any relevant works commence. Elimination of the hazard is the first preference of control, followed by engineering, then administrative controls.

Table 13 Flora and fauna controls

Control	Accountability
Before the commencement of demolition works, a Tree Protection Zone/s (TPZ) must be established around trees to be. Tree protection must be installed and maintained in accordance with the Australian Standard 4970 Protection of Trees on Development Sites.	Project Engineer

Control	Accountability
If a threat to an animal is evident onsite Supervisor and Project Environmental Representative must be notified immediately. Works may need to cease if the animal is in danger or harmed until it has been relocated by a qualified ecologist or licensed wildlife handler.	Supervisor
The site speed limits must be obeyed at all times, especially areas where vehicle/fauna interactions are identified as high risk.	All
All plant should remain on haul roads as much as possible to minimise damage to vegetation	Supervisor
No-go fencing must be installed prior to construction works.	Project Engineer
No-go zones must always be obeyed unless a Permit to Enter No-go Zone has been issued. Any damage to no-go zone fencing or signage shall be reported to the supervisor or Project Environmental Representative immediately.	All
Cleared/removed vegetation will be beneficially used either on or off the Project where possible (e.g. for habitat, chipped for mulch and reused)	Project Engineer
Where possible revegetation activities will preferentially use only species that are indigenous to the area.	Project Engineer
Boundaries of allowable disturbance areas on the Project are clearly marked and delineated.	Project Engineer
Construction site fencing is to be installed around the demolition site. Vehicle and workforce access points and roads to the construction compounds are to be clearly designated and controlled for authorised access only.	Project Engineer
All plant to exit via controlled site access and to be cleaned in wash out bay prior to leaving site to minimise the spread of weeds.	Supervisor

13.5 Monitoring

Given the nature and location of the Project, monitoring will be restricted to tree protection zones and exclusion areas, and isolated fauna sightings. This monitoring will identify potential non-compliances before they occur.

Where monitoring determines non-compliance to be a risk or to have occurred, an incident report and corrective actions are raised in Synergy.

Monitoring and analysis of data will be carried out by the site Project Environmental Representative and Construction Manager as part of the routine site inspections. Evidence of competence shall be retained.

It is the responsibility of the Project Environmental Representative to ensure all monitoring is performed according to these requirements.

14. Energy Subplan

14.1 Scope

This Plan addresses the potential and actual use of energy sources and the emission of greenhouse gases (GHG) by Project activities. It outlines:

- The identification of sources
- Measurement and reporting of use and emissions
- Identification, assessment and implementation of opportunities to improve energy efficiency and reduce GHG emissions

Activities conducted on the project that have the potential to use significant amounts of energy or emit significant quantities of GHG are identified in Table 14.

Table 14 Project emission sources

Project Activity	Type of Fuel/Emission
Plant and Equipment	Diesel and petrol
Construction Operations	Electricity, Water
Light Vehicles	Diesel, Petrol

14.2 Project Compliance Requirements

14.2.1 Contract clauses

Table 15 Contract requirements related to greenhouse gases and energy

Contract Document Reference	Contract Clause/Reference	Limit/Requirement
GC21 Preliminaries	6.2	Apply strategies to maximise the achievement of ecologically sustainable development in the design, construction and operation of the Works, including reducing pollutants, greenhouse gas emissions and demand on non-renewable resources such as energy sources and water.

14.2.2 Conditions of Approval

Conditions of approval which set limits and/or specify requirements relating sustainability, energy efficiency requirements, or controls on GHG emissions on the project are listed in Table 16.

Table 16 Sustainability Conditions of Approval

Condition of Approval	Limit/Requirement
B16	Within 6 months of the commencement of construction, the Applicant must register for a minimum 4 star Green Star rating with the Green Building Council Australia and submit evidence of registration to the Certifying Authority unless the NSW Health Engineering Services Guidelines are updated demonstrating equivalency with an accredited rating scheme to the satisfaction of the Planning Secretary.

14.3 Energy Reporting

CPB Contractors requires all projects to report on energy consumption monthly, regardless of which company has operational control.

All energy (fuels, oils, greases, gases, electricity, solvents) purchased by CPB Contractors and processed through JDE are captured centrally at the Group level.

If a project is not using CPB JDE, both invoiced and contractor energy use must be collated and entered into Synergy monthly by the Project Environmental Representative.

Operational control, which determines which company will be required to report a project under the *National Greenhouse and Energy Reporting Act 2007,* is determined as part of the project start-up process. A copy of the operational control determination can be obtained by contacting the Group Environment Team.

14.4 Processes / Controls Used to Manage Energy

Controls to ensure energy is used efficiently and GHG emissions are minimised are implemented are identified in Table 17.

Table 17 Energy efficiency controls

Control	Accountability
An energy opportunities assessment will be undertaken to identify opportunities for energy efficiency in both construction and operation. As a minimum, this can involve the use of the Energy Opportunities Calculator.	Project Manager
Energy savings initiatives and outcomes must be reported to the BU Environmental Representative at least annually using the Tool 'Energy Case Study'.	Project Environmental Representative
The Project commercial team will track subcontractor fuel reporting, with reporting percentages included in the Project Monthly Environment Report in Synergy.	Project Environmental Representative
Energy efficiency principles will be communicated through toolbox talks and other site communication forums and tools. The workforce, including subcontractors, will be educated through the induction to minimise energy use, including switching off machines and equipment when not in use and purchasing energy efficient plant and equipment.	Project Environmental Representative
Where relevant, procurement decisions will include energy efficiency and greenhouse gas considerations of the product or service.	Project Manager / Procurement Manager

14.5 Monitoring

Energy use and fuel consumption will be recorded on a monthly basis for tracking and reporting requirements. This information will be used to identify sources of use and emissions, and opportunities for improved energy efficiency.

Energy and GHG monitoring are conducted in line with the CPB Contractors reporting approach outlined above. It is the accountability of the Project Manager to ensure all data is captured and reported according to these requirements.

Monitoring and analysis of data will be collated through the procurement process where possible. The Project Environmental Representative will coordinate the data collation and reporting for the project.

15. Air Quality Subplan

15.1 Scope

This Plan addresses air quality management (specifically dust impacts from construction) on the project and the management of impacts to the environment and/or community.

Activities conducted on the project that have the potential to impact air quality are provided below. These have been extracted from the project workflow, including activities and materials used.

Table 18 Air quality hazards and risks

Project Activity	Environmental Hazard	Environmental Risk
Demolition	Dust Sediment on roads	Nuisance dust to personnel Airborne dust/ sediment affecting waterways
Contamination remediation	Contamination particles becoming airborne during remediation	Environmental hazard to construction personnel and general public
Plant and Machinery operation	Exhaust fumes	Effects on health/ exposed to carbon monoxide
General construction works	Wind-blown rubbish/dust	Nuisance dust to personnel Airborne dust/ sediment affecting waterways
Earthworks / Exposed surfaces	Dust	Nuisance dust to personnel Airborne dust/ sediment affecting waterways

15.2 Plan Objectives

The performance targets in Table 19 have been determined following a project risk management assessment and considering potential impacts to the community. Any deviation from the targets will result in Project Management immediately implementing corrective actions.

Table 19 Air quality performance objectives

Metric/Measure	Objective	Timeframe	Accountability
Number of non-compliant monitoring results	Zero	At all times	Project Manager
Number of air quality related complaints	Zero	At all times	Project Manager

15.3 Project Compliance Requirements

15.3.1 Contract clauses

Specific contract clauses and references which set limits and/or govern impacts to air quality on the project are identified in Table 20.

Table 20 Contract requirements related to air quality

Contract Document Reference	Contract Clause/Reference	Limit/Requirement
MW GC21 e2	5.7	Provide asbestos air monitoring by an independent testing authority engaged by the Contractor, in respect of the following: ▪ for each day that demolition, ground remediation and any works involving existing fill material likely to contain asbestos, are being carried out; and ▪ otherwise on each day during asbestos removal until completion of each area where removal has been undertaken. To avoid any doubt, asbestos air monitoring for demolition and ground remediation is not subject to asbestos being present or removed.

Contract Document Reference	Contract Clause/Reference	Limit/Requirement
MW GC21 e2	5.17	The Contractor must take all reasonable precautions to avoid nuisance or trespass of any nature to any surrounding or adjoining areas to the Site, as a result of undertaking the Works, including by way of dust, mud, debris, noise, obstruction, vibration, or by its employees, agents, subcontractors or visitors or any other cause. The Contractor must utilise reasonable methods (having regard to the use and operation of any existing health facilities in close proximity to the Site) of noise and dust suppression on all compressors, jack-hammers and other machinery of whatsoever description to ensure that the noise and dust levels emanating from the Site during the Works are minimised. Without limiting these requirements, the Contractor shall comply with all relevant codes and shall also erect screens (both visual and acoustic) or take other reasonably necessary preventative measures to prevent noise, dust and damage to surrounding or adjoining properties (public and private) and shall arrange for the programming of the Works to avoid or minimise any such issues occurring.

15.3.2 Conditions of Project Environmental Approvals

Conditions of approval that specifically address the management of air quality are captured in Table 21.

Table 21 Air quality Conditions of Approval

Environmental Approval Document Reference	Relevant Condition
C26	The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.
C27	During construction, the Applicant must ensure that: (a) exposed surfaces and stockpiles are suppressed by regular watering; (b) all trucks entering or leaving the site with loads have their loads covered; (c) trucks associated with the development do not track dirt onto the public road network; (d) public roads used by these trucks are kept clean; and (e) land stabilisation works are carried out progressively on site to minimise exposed surfaces.
C28	The Applicant must install and operate equipment in line with best practice to ensure that the development complies with all load limits, air quality criteria/air emission limits and air quality monitoring requirements as specified in the EPL applicable to the site.

15.4 Controls Used to Manage Air Quality

Controls that are adequate to minimise air quality issues and to reduce risk to the lowest acceptable rating achievable are implemented before any relevant works commence. Elimination of the hazard is the first preference of control, followed by engineering, then administrative controls. Controls used on this project are identified in Table 22.

Table 22 Air quality controls

Control	Accountability
Areas in which vegetation will be removed or disturbed need to will be minimised. Rehabilitation, seeding or grassing should occur as soon as they become available.	Project Environment Representative
Disturbed areas and haul roads must be treated with dust suppressants (e.g. water trucks or chemical suppressants) especially in high risk areas and/or on during high risk days.	Project Manager

Control	Accountability
Stabilised access, rumble grids, wash bays or similar must be established for the entries site and exits to site to minimise mud on public roads. Sweepers shall be used periodically to clean public roads where mud has been deposited.	Project Manager
Traffic speed limit(s) are determined to minimise dust generation and must always be adhered to.	Project Manager
All construction plant and equipment must be maintained so they do not emit visible smoke for any period greater than: ▪ 15 consecutive seconds for plant not being registered for use on public roads; and ▪ 10 consecutive seconds for plant registered for use on public roads.	Project Manager
Burning of any materials is prohibited onsite.	All
Competently designed and constructed rumble pads shall be established for the ingress and egress of all vehicles.	Project Manager
Visual air quality monitoring will be conducted for the Project to monitor for potential dust impacts leaving the site. Should visible dust be observed leaving the Project, construction activities will be reviewed.	Project Manager
Exposed surfaces and stockpiles are to be suppressed by regular watering;	Project Manager
All trucks entering or leaving the site will have loads have their loads covered;	Project Manager
Trucks associated with the development are to be monitored to prevent tracking of dirt onto the public road network;	Project Manager
Local public roads used by these trucks are kept clean	Project Manager
Land stabilisation works are to be carried out progressively on site to minimise exposed surfaces.	Project Manager
Equipment will be installed and operated in line with best practice to ensure that the development complies with all load limits, air quality criteria/air emission limits and air quality monitoring requirements.	Project Manager

15.5 Monitoring

Air quality monitoring for dust and vehicle emissions during non-remediation activities will be undertaken as daily visual monitoring of dust leaving site. Where monitoring determines non-compliance to be a risk or to have occurred, an incident report and corrective actions are raised in Synergy.

Monitoring and analysis of data will be carried out by the Project Environmental Representative and Construction Manager. Evidence of competence must be retained.

It is the accountability of the Project Environmental Representative to ensure all monitoring is performed according to these requirements.

15.5.1 Air quality monitoring during remediation

Refer to section 9.11 of the RAP for detailed instructions on air quality requirements during remediation and contamination works. A summary of the monitoring commitments is provided below for information purposes:

- During remediation activities, airborne asbestos fibres monitoring will be undertaken at a minimum of five static locations. Monitoring locations will include site perimeter locations and downwind locations.
- During contaminated soil remediation works, real-time aerosol monitoring shall be undertaken at five locations, twice daily for ten minutes (morning and afternoon).

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Appendix A: CPB Contractors Environment Policy

Environment Policy

Purpose

This Policy sets out the minimum mandatory requirements for the management of environmental risks and impacts from our construction activities.

Application

This Policy applies to all business entities controlled by the business, including alliances, joint ventures and consortia where the business exerts management control. It applies at all levels of the organisation including Corporate, Business Unit and Project.

Minimum Requirements

- Senior leaders must demonstrate a personal visible commitment to our SH&E Cultural Framework and ensure all workers understand the requirements of the Management System as it applies to the work they are undertaking, so that work is undertaken to minimise our environmental impact.
- Environment Management Plans (EMP) must be developed and implemented for each Project to outline how the project environmental risk will be managed and controlled.
- Environmental objectives, targets and key performance indicators must be established at all levels of the organisation, with performance against these monitored and analysed to provide a baseline for continual improvement.
- The Environment Procedures must be used to eliminate or minimise environmental risk from construction activities.
- Construction Area Plans and Work Packs must be developed and include an assessment of environmental risk and associated controls.
- Site Environment Plans must be developed for Work Packs where environmental risk dictates; these must be used to inform as content of Daily Pre Starts.
- As part of the risk management process, personnel and teams at the Project, Business Unit and Corporate level should seek to identify opportunities for improving efficiency in the use of natural resources, enhancing positive environmental impacts and driving innovation.
- All environmental incidents must be reported in accordance with the incident notification requirements. They must be thoroughly investigated and appropriate corrective action undertaken with the aim of preventing recurrence of the incident.
- Reporting of energy consumption, water use and waste generation, as well as reporting on initiatives and environmental achievements must be completed by projects and business units as requested.

Appendix B: Environmental Roles and Responsibilities

Listed project-specific roles, after responsibilities in Part B have been assigned

		Project Manager	Project Environmental Rep.	Engineering Manager	Engineers	Construction Manager	Supervisors	Line Manager	P&C Manager	Commercial Manager	Comm & S' hold Manager	H&S Manager	Other positions
Element 1:	**Leadership, Accountability and Culture**												
1.1.	Environmental accountabilities, roles and responsibilities for managers, staff, employees and subcontractors are clearly defined, documented and communicated		C					C	R				
1.2.	Environmental leadership and commitment is demonstrated through measurable participation in environmental management	R	C				C	C					
1.3.	Environmental expectations are clearly defined with appropriate reward and disciplinary processes in place.	R	C					C					
Element 2:	**Planning**												
2.1.	Adequate resources are provided to effectively implement the EMP	R	C						C	C			
2.2.	Business systems are defined and established		R										
2.3.	Environmental Sub-Plans are prepared and maintained for Significant Environmental Hazards		R										
Element 3:	**Legal and Other Requirements**												
3.1.	Relevant legal, contractual and other requirements are identified and maintained in a legal and other obligations register	C	R										
3.2.	All necessary environmental approvals are obtained prior to commencing relevant works and surrendered on completion	C	R		C								
3.3.	Work is planned and executed to ensure compliance		C	C	C	R	C						
3.4.	Inspections, observations and monitoring are performed to ensure compliance is maintained		C		C		R						
3.5.	All non-compliances are reported as incidents		R										
3.6.	All energy and greenhouse data are collected and entered into JDE	C	R							C			
3.7.	Personnel on the site have access to current versions of relevant legislation, standards and codes of practice		C										R
Element 4:	**Risk and Opportunity Management**												
4.1.	Systematic processes are defined and implemented for identifying environmental risks and opportunities at all stages of the Project	R	C	C	C		C						
4.2.	Identified risks and opportunities are analysed and evaluated according to agreed criteria and recorded in a risk register	R	C		C								C
4.3.	Environmental controls appropriate to the level of risk are identified, documented and implemented	C	C		C								R
4.4.	Feasible opportunities are implemented	R											C
4.5.	Identified environmental risks and controls are communicated to all relevant personnel	R	C		C		C		C			C	
4.6.	Regular inspections and monitoring are conducted to check effectiveness of controls	C	R		C		C						
4.7.	Environmental risks and controls are regularly reviewed.	R	C		C								
Element 5:	**Change Management**												
5.1.	Changes to planned operations that have potential environmental consequences are identified	R	C	C	C		C						
5.2.	Risks associated with identified changes are assessed and controlled before changes are implemented	R	C				C						C
5.3.	All changes with environmental consequences are authorised before they are implemented	R		C		C	C						
5.4.	Controls associated with change are communicated to all affected personnel						C						R
Element 6:	**Communication and Consultation**												
6.1.	External environmental stakeholders are identified		C								R		
6.2.	Relationships with external stakeholders are effectively managed		R								C		
6.3.	Internal consultative forums are established with regular meetings scheduled, conducted, documented and communicated	R	C								C	C	
6.4.	Environmental complaints and enquiries are recorded and responded to appropriately	C	C								R		
6.5.	The effectiveness of internal and external stakeholder engagement is evaluated and improved.	R	C								C	C	

	Project Manager	Project Environmental Rep.	Engineering Manager	Engineers	Construction Manager	Supervisors	Line Manager	P&C Manager	Commercial Manager	Comm & S' hold Manager	H&S Manager	Other positions
Element 7: Training and Competency												
7.1. All personnel have completed an induction containing relevant environmental information before they are authorised to work on the Project		R						C			C	
7.2. A training plan is developed and documented		R						C				
7.3. Personnel are trained and assessed according to the training plan	R	C						C				
7.4. Training records are maintained and accessible to relevant personnel.		C						R				
Element 8: Subcontractor Relationships												
8.1. Selection processes ensure that subcontractors meet CPB Contractors' minimum environmental requirements		C		C					R			
8.2. Planning requirements of all subcontractor work scopes are completed and communicated prior to commencing work		C		R					C			
8.3. Compliance requirements for high risk environmental activities are identified and enforced		C		R					C			
8.4. Subcontractor documentation is submitted and reviewed to meet Project requirements		R		C					C			
8.5. Changes to the scope of work are managed as a Project change				C					R			
8.6. Subcontractors actively participate in environmental management and training on the Project		C		C					R			C
8.7. Subcontractors are reviewed to assess their performance and compliance with our minimum environmental requirements.		R		C		C						
Element 9: Incident Management												
9.1. All incidents are followed by appropriate response and notification	R	C		C		C				C		
9.2. All incidents are entered and managed in Synergy	C	R										
9.3. Incident investigations are conducted appropriate to the type of incident	R	C		C		C						
9.4. All personnel conducting incident investigations are trained to competently perform the task	R											
9.5. Corrective and preventive actions are taken after incidents and lessons are shared with other projects	R	C										
9.6. High potential and repeat incidents are regularly reviewed by the project management team	C	R										
Element 10: Emergency Planning and Response												
10.1. Potential emergencies are identified using a formal risk assessment process	R	C										
10.2. Emergency response plans and procedures are developed and regularly reviewed	R	C									C	
10.3. Adequate resources are provided to effectively implement emergency response plans and procedures	R	C									C	
10.4. Environmental emergency response drills are conducted	R	C									C	
10.5. Employees, contractors and visitors are given appropriate emergency response training.		C						R			C	
Element 11: Document and Record Management												
11.1. Current versions of all relevant documents and records are available and controlled.	C	R										
11.2. Relevant documents and records will be maintained using corporate business applications and systems	R											
Element 12: Auditing, Review and Improvement												
12.1. Environmental performance trends are identified and corrective actions are implemented as required	R	C										
12.2. A monthly environmental report is produced and distributed	C	R										
12.3. Regular management reviews are conducted to determine the continuing suitability, adequacy and effectiveness of the Environmental Management System	R	C										C
12.4. Audits are undertaken to ensure compliance with the requirements of the EMP	R	C										C
12.5. All audits are undertaken by suitably qualified and experienced personnel												R

R = Responsible, **C** = Key Contributor

Appendix C: Environmental Risk Register

The risk assessment criteria has been developed in line with the CPB Management System (CMS). Qualitative measures are used to estimate the consequence or impact of an event, along with the estimate of likelihood, to produce consistent risk rankings across the identified risks using Steps 1 – 3 as outlined below.

Step 1 - What is the Most Credible Consequence?

Consequence Rating	1 Negligible	2 Minor	3 Moderate	4 Major	5 Substantial
Safety and Health	First Aid Treatment (or No treatment)	Medical Treatment Injury	Lost Time Injury	Permanent Injury (Paraplegia, Amputation)	Fatality (Single or multiple)
Environment and Heritage	Small, contained localised impact / Low level repairable damage	Short lived, well contained environmental impact / Minor remedial action required	Medium term, contained impact / Significant remedial action required	Impacts extend off-site / external ecosystem. Considerable remediation required	Lonr Term irreversible damage / Long Term Remediation required
Plant Damage	Little or No Damage	Damage less than $15,000	Damage between $15,000 and $50,000	Damage between $50,000 and $100, 000	Damage greater than $100, 000
Reputation	Brief local negative media coverage.	Local negative media coverage. Site or project problem.	Regional/short negative media coverage. Loss of Client / project.	Sustained national negative media coverage. Loss of long term key client.	International negative media coverage. Loss of business from key sector.
Time	Delay / Business interruption <1% of program days	Delay / Business interruption between 1%-3% of program days	Delay / Business interruption between 4%-6% of program days	Delay / Business interruption between 7%-10% of program days	Delay / Business interruption >10% of program days
Cost	Additional cost to the business / project <1% revenue	Additional cost to the business / project between 1%-3% revenue	Additional cost to the business / project between 4%-6% of revenue	Additional cost to the business / project between 7%-10% of revenue	Additional cost to the business / project >10% of revenue

Step 2 - What is the likelihood of that Consequence occurring in the circumstances?

Likelihood Ranking				
Score	Description		Percentage	Expected Frequency
5	Almost Certain	Common / Frequent Occurrence	Can be expected to occur 75% - 99%	More than 1 event per month
4	Likely	Is known to occur or "It has happened regularly"	Can quite commonly occur 50% - 75%	More than 1 event per year
3	Possible	Could occur or "I've heard of it happening"	May occasionally occur 25% - 50%	1 event per 1 to 10 years
2	Unlikely	Not likely to occur very often	May infrequently occur 10% - 25%	1 event per 10 to 100 years
1	Rare	Conceivable but only in exceptional circumstances	May occur in exceptional circumstances 0% – 10%	Less than 1 event per 100 years

Step 3 – Determine the Risk Level

Determine the risk score by combining most credilble consequence with likelihood

Likelihood	Consequence Rating	Negligible 1	Minor 2	Moderate 3	Major 4	Substantial 5
Almost Certain	5	5 (Low)	10 (Moderate)	18 (Very High)	23 (Extreme)	25 (Extreme)
Likely	4	4 (Low)	9 (Moderate)	17 (Very High)	20 (Very High)	24 (Extreme)
Possible	3	3 (Low)	8 (Moderate)	13 (High)	19 (Very High)	22 (Very High)
Unlikely	2	2 (Low)	7 (Low)	12 (High)	15 (High)	21 (Very High)
Rare	1	1 (Low)	6 (Low)	11 (Moderate)	14 (High)	16 (High)

Risk ID	Category	Activity	Hazard/Aspect	Cause	Consequence /Impact	Current Controls	Risk Score
E1	Environment	Planning Approvals and Licences	Non-Compliance with Regulatory instruments or Legislation (incl. Planning Approval conditions)	Inadequate management practices; Lack of competency/knowledge; Contractor management gaps	Regulatory action (prosecution, pins). Delay to subsequent approval requests, (delay to program) Contractual Breach Reputation Damage Non-compliance with sustainability certification	▪ Implementation of CEMP ▪ Induction included summary of regulatory obligations ▪ Supplier contracts included details of regulatory obligations ▪ Suitably qualified environment representative in delivery team	13 (High)
E2	Environment	Planning Approvals and Licences	Commencing work without approvals	Inadequate planning	Regulatory action (prosecution, pins). Delay to subsequent approval requests, (delay to program) Contractual Breach	▪ Approvals on master program ▪ Low impact / early works approval Procedure ▪ Change Management Procedure ▪ Suitably qualified environment representative in delivery team	13 (High)
E3	Environment	Planning Approvals and Licences	New approvals requirements due to scope change	New approvals requirements due to scope change	Regulatory action (prosecution, pins). Delay to subsequent approval requests, (delay to program) Contractual Breach	▪ Approvals on master program ▪ Low impact / early works approval Procedure ▪ Change Management Procedure ▪ Suitably qualified environment representative in delivery team (in design review)	11 (Moderate)
E4	Environment	Biodiversity and Ecology	Clearing or trimming without a permit, approval and/or pre-clearance survey	Inadequate management of environmental aspects; Lack of competency/knowledge	Regulatory action (prosecution, pins); Contractual Breach; Non-compliance with sustainability certification; Impact to existing flora and fauna communities	▪ Flora and Fauna Management Sub-Plan and Procedure ▪ Inductions included details of flora and fauna management requirements ▪ Toolbox training on management of flora and fauna during construction ▪ Site Environment Plans (SEP) ▪ Suitably qualified environment representative in delivery team ▪ Specialist consultant for Flora/ Fauna Management ▪ Tree report prepared by arborist required for all tree trimming or removal.	7 (Low)

Risk ID	Category	Activity	Hazard/Aspect	Cause	Consequence /Impact	Current Controls	Risk Score
E5	Environment	Biodiversity and Ecology	Damage to existing flora	Construction activities impacting existing vegetation due to poorly demarcated site	Regulatory action (prosecution, PINs) Breach of deed requirements Reputation Non-compliance with sustainability certification Impact to existing flora and fauna communities	▪ No-go fencing is to be installed and clearly defined on SEP ▪ Flora and Fauna Management Sub-Plan and Procedure ▪ Inductions included details of flora and fauna management requirements ▪ Toolbox training on management of flora and fauna during construction ▪ Trees to be retained to be protected in accordance with Australian Standard AS4970 (200–) - Protection of Trees on Development Sites and Adjoining Properties	7 (Low)
E6	Environment	Biodiversity and Ecology	Unexpected flora and fauna finds	Pre-clearance checks not undertaken Inadequate site delineation	Impact to flora and fauna communities	▪ Flora and Fauna Management Sub-Plan and Procedure ▪ Inductions included details of flora and fauna management requirements ▪ Toolbox training on management of flora and fauna during construction	3 (Low)
E7	Environment	Transport and Traffic	Changed traffic conditions in the neighbourhood or increased traffic	Traffic entering/leaving construction sites and compounds	Increased local traffic Changes to local traffic conditions Air quality impacts Noise impacts	▪ Construction Traffic Management Plan and TCP's ▪ Community Communications Strategy ▪ Project induction included Traffic management obligations ▪ Site Inductions and Truck Driver training included site specific requirements ▪ Road Act Approvals ▪ Air Quality Management Sub-Plan ▪ Construction Noise and Vibration Management Sub-Plan	9 (Moderate)

Risk ID	Category	Activity	Hazard/Aspect	Cause	Consequence /Impact	Current Controls	Risk Score
E8	Environment	Transport and Traffic	Increased heavy vehicles traffic	Haulage	Increased local traffic Changes to local traffic conditions Air quality impacts Noise impacts	▪ Construction Traffic Management Plan ▪ TCP's and VMPs ▪ Community Communications Strategy ▪ Road Act Approvals ▪ Air Quality Management Sub-Plan ▪ Construction Noise and Vibration Management Sub-Plan ▪ Site Inductions and Truck Driver training included site specific haulage routes	10 (Moderate)
E9	Environment	Transport and Traffic	Road closure - for heavy delivery	Heavy deliveries	Changes to local traffic conditions Increased local traffic Community complaints	▪ Construction Traffic Management Plan ▪ Community Communications Strategy ▪ Site Induction and tool box training included any requirements for road closure	9 (Moderate)
E10	Environment	Noise and Vibration	Unapproved works outside hours	Inadequate planning Not complying with the out of hours approval process and requirements	Regulatory action (prosecution, pins). Contractual Breach Reputation Community complaints	▪ Out of Hours Works on delivery program ▪ Construction Noise and Vibration Management Sub-Plan ▪ Construction Noise and Vibration Impact Statements (CNVIS) ▪ OOHW Procedure ▪ Induction included reference to obligations for management of OOHW ▪ Tool box training on management OOHW ▪ Suitably qualified environment representative in delivery team to assess and monitor	13 (High)

Risk ID	Category	Activity	Hazard/Aspect	Cause	Consequence /Impact	Current Controls	Risk Score
E11	Environment	Noise and Vibration	Cumulative / daytime construction noise	Construction activities not allowing for respite periods; Inadequate planning and consultation; Not complying with the noise management requirements	Community complaints Reputation	▪ Out of Hours Works on delivery program ▪ Construction Noise and Vibration Management Sub-Plan ▪ Construction Noise and Vibration Impact Statements (CNVIS) ▪ OOHW Procedure ▪ Induction included reference to obligations for management of noisy activities, standard working times and OOHW. ▪ Tool box training on management of noise and vibration ▪ Suitably qualified environment representative in delivery team to assess and monitor ▪ Community Communications Strategy	13 (High)
E12	Environment	Noise and Vibration	Vibration impacts of heavy plant	Heavy plant movements and activities Use of percussive machinery	Community complaints Damage to existing infrastructure Damage to heritage buildings	▪ Construction Noise and Vibration Management Sub-Plan ▪ Construction Noise and Vibration Impact Statements (CNVIS) ▪ Heritage Management Sub-Plan ▪ Induction included reference to obligations for vibration management ▪ Tool box training on management of vibration ▪ Suitably qualified environment representative in delivery team to assess and monitor vibration ▪ Community Communications Strategy	12 (High)
E13	Environment	Heritage and Archaeology	Unexpected archaeological finds	Unexpected find(s) Inadequate demarcation of site Location of known site(s) not referenced in site plans and communicated to personnel. Not following unexpected finds protocol	Delay to program Damage to relics	▪ Heritage Management Sub-Plan ▪ Unexpected Finds Heritage and Human Remains Procedure ▪ Inductions included reference to obligations with regard to unexpected finds ▪ Tool box training on management of unexpected finds ▪ Specialist consultant to manage unexpected finds	7 (Low)

Risk ID	Category	Activity	Hazard/Aspect	Cause	Consequence /Impact	Current Controls	Risk Score
E14	Environment	Soil and Water	Sediment run-off	Inadequate sediment control Not complying with sediment control plans	Pollution of water Impact on aquatic ecology Sedimentation of waterways Regulatory action Delay to program Community impacts	▪ Soil, Water and Groundwater Management Sub-Plan and associated Procedures ▪ Erosion and Sediment Control Plans ▪ Induction includes reference to obligations associated with management of spoil and water during construction ▪ Toolbox training on management of ERSED and de-watering ▪ Suitably qualified environment representative in delivery team ▪ Specialist consultant for ERSED development and review	13 (High)
E15	Environment	Soil and Water	Unapproved discharge of water from site	Poor planning of construction activity Not obtaining or working in accordance with an issued water discharge permit (as per de-watering procedure)	Pollution of water Impact on aquatic ecology Sedimentation of waterways Regulatory action Delay to program Community impacts	▪ Soil, Water and Groundwater Management Sub-Plan and associated Procedures ▪ Erosion and Sediment Control Plans ▪ Induction includes reference to obligations associated with management of spoil and water during construction ▪ Toolbox training on management of ERSED and de-watering ▪ Suitably qualified environment representative in delivery team	13 (High)
E16	Environment	Soil and Water	Unexpected finds of contaminated soil, hazardous materials or acid sulfate soils	Unexpected finds during construction activities Not following unexpected finds protocol	Additional cost for assessment and disposal Program delay Soil contamination from inadequate disposal	▪ Soil, Water and Groundwater Management Sub-Plan ▪ Unexpected Finds Soil Contamination and Asbestos Procedure ▪ Waste Management and Recycling Procedure ▪ Induction includes reference to obligations associated with management of waste, unexpected finds, contamination, acid sulfate soils and hazardous materials. ▪ Toolbox training on management of contamination and unexpected finds ▪ Suitably qualified environment representative in delivery team ▪ Specialist consultant for contamination management	7 (Low)

Risk ID	Category	Activity	Hazard/Aspect	Cause	Consequence /Impact	Current Controls	Risk Score
E17	Environment	Soil and Water	Chemical / hazardous materials storage and use	Unapproved use of materials on-site Inappropriate use or storage Inadequate storage and containment controls	Pollution of water Pollution of soil	▪ Project Health and Safety Management Plan ▪ Emergency Response Plan/Spill Management Procedure ▪ Site Environment Plans include designated storage areas ▪ Refuelling procedures ▪ Tool box training substance storage and management ▪ Induction reference substance storage obligations	12 (High)
E18	Environment	Soil and Water	Interception of ground water	Not following soil and water management plan Insufficient geotechnical data	Pollution of waters Delay to program Salinity impacts on infrastructure	▪ Soil, Water and Groundwater Management Sub-Plan and associated Procedures ▪ Induction included reference to groundwater management obligations ▪ Toolbox training delivered included management of Groundwater during construction	8 (Moderate)
E19	Environment	Visual Amenity	Visual impacts	Not cordoning off the worksite with fencing, shade cloth in accordance with contract requirements	Light pollution Temporary hoarding Graffiti	▪ Visual Amenity Management Sub-Plan ▪ Community Communications Strategy	7 (Low)
E20	Environment	Social and Economic Impacts	Local economy	Construction activities impacting local businesses	Impact on businesses Local employment	▪ Sustainability Management Plan ▪ Sustainable Workforce Target	7 (Low)
E21	Environment	Greenhouse Gas and Climate Change	Increased energy usage	Poor planning of construction activity Not following greenhouse gas management plans	Increased costs Increased greenhouse GHG emissions Contributing to climate change	▪ Sustainability Management Plan Construction programming	7 (Low)

Risk ID	Category	Activity	Hazard/Aspect	Cause	Consequence /Impact	Current Controls	Risk Score
E22	Environment	Air Quality	Dust generation	Poor planning of construction activity Not complying with the air quality, management plan, working in windy conditions, not covering loads Delays in stabilisation of disturbed land	Community impacts Regulatory action Air pollution	▪ Air Quality Management Sub-Plan and Procedures ▪ Water Management Procedures (for dust suppression) ▪ Induction includes air quality management requirements ▪ Toolbox Training of workforce on management of air quality during construction	8 (Moderate)
E23	Environment	Air Quality	Exhaust emissions	Poor planning of construction activity Not complying with the air quality management plan; Inadequate plant management	Community impacts Regulatory action Air pollution	▪ Air Quality Management Sub-Plan ▪ Induction included air quality management requirements ▪ Toolbox Training of workforce on management of air quality during construction;	7 (Low)
E24	Environment	Waste	Incorrect disposal of waste	Poor planning of construction activity Not following waste management plan	Regulatory action (prosecution, PINs)	▪ Waste and Recycling Management Sub-Plan and Procedures ▪ Induction included waste management requirements ▪ Toolbox training of workforce on waste management	8 (Moderate)
E25	**Environment**	Waste	Excess waste generation	Poor planning of construction activity Not following waste management plan	Non-compliance with sustainability certification	▪ Waste and Recycling Management Sub-Plan ▪ Sustainability Management Plan ▪ Induction included waste management requirements ▪ Toolbox training of workforce on waste management ▪ Waste reduction initiatives to be implemented as per the Sustainability Management Plan	7 (Low)

Risk ID	Category	Activity	Hazard/Aspect	Cause	Consequence /Impact	Current Controls	Risk Score
E26	**Environment**	Noise and Vibration	Settlement	Construction activities impacting on surrounding buildings structural integrity	Structural damage to surrounding buildings	▪ Pre construction building condition surveys ▪ Settlement monitoring ▪ Specialist consultant structural engineer engaged	11 (Moderate)

Appendix D: MIRRA Schedule

(Monitoring, Inspections, Reporting, Review, Audit) Schedule

MIRRA Schedule provided below.

Name	Detail	Frequency	By Whom	Resources
MONITORING				
Traffic	Visual observations of: ▪ Traffic control measures and their effectiveness; ▪ Access and egress points to ensure no dirt/debris is being tracked out;	Daily	Supervisor	Daily diary
Weather	Check weather and rainfall forecasts.	Daily	Project Environment Representative	http://www.bom.gov.au/
Waste	Monitor and record the volumes of waste and the methods and locations of disposal.	Daily	Project Engineer	Waste and Material Tracking Spreadsheet
Air quality	Visual monitoring for dust and vehicle emissions during non-remediation activities.	Daily	Supervisors	Daily diary
Air quality (remediation)	▪ Airborne asbestos fibre monitoring; and ▪ Dust monitoring	Daily	Remediation consultant	Monitoring reports
Noise monitoring (North & East Block)	Noise monitoring at the commencement of ripping work is recommended to determine if any further protection (or scheduling of works) is required to the operating suites/day surgeries in North and East Block.	As required	Project Environment Representative	Noise record sheet
Vibration	Unattended vibration monitoring is recommended at North & East Block.	During excavation, compaction and piling process.	Vibration consultant	Vibration monitoring reports
Energy use	Energy use and fuel consumption.	Monthly	Commercial	JDE
INSPECTIONS				
Site Inspection	Environmental zone inspections	Weekly	Project Environment Representative	Weekly Environmental Inspection Checklist
REPORTING				
Environmental Report	Detail on Environmental achievements, monitoring results, incidents, audit outcomes	Monthly	Project Environment Representative	As part of Monthly Project Report

Name	Detail	Frequency	By Whom	Resources
Waste	Total quantity of material purchased, the quantity purchased with recycled content, the total quantity of waste generated, the total quantity recycled, the total quantity disposed of and the method and location of disposal.	Every 2 months	Project Environment Representative	Waste and Material Tracking Spreadsheet
REVIEW				
EMP Review	Review of sub plans and Appendices	Quarterly	Project Environment Representative	EMP
Risk Register Review	Review risks in relation to changes to work activity onsite	Monthly	Project Environment Representative	Risk Register
Site Env Plan	Review site environmental controls in relation to work activity onsite to ensure reflective of site conditions	Fortnightly	Project Environment Representative	TBC
AUDIT				
CPB Contractors Internal SHEQ Audit	Review of EMP compliance to CPB Contractors EMS/ ISO14001		SHEQ Team	TBC

Appendix E: Compliance Monitoring and Reporting Program

Nepean Redevelopment

Compliance Monitoring and Reporting Program

SSDA 8766 – Nepean Hospital Redevelopment – Stage 1

Version Number	Date	Comment	Author
0.1	12 March 2019	Initial Draft	CM
0.2	5 April 2019	Final	CM
0.3	11 April 2019	Updated with DPE comments	CM

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1. Glossary of Terms

Term / Acronym	Definition
Aconex	A web-based document management system that provides the primary document management application for CPB on the project and will be used to manage correspondence, design documentation, electronic distribution and approval processes, records and identified records and quality documentation.
CEMP	Construction Environmental Management Plan
Client	Health Infrastructure
CoA	Conditions of Approval
CPB	CPB Contractors
CMRP	Compliance Monitoring and Reporting Program
CTP	Compliance Tracking Program
D&C	Design & Construct
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	NSW Environmental Protection Authority
EPL	Environmental Protection Licence
ER	Environmental Representative
RMS	Roads and Maritime Service
WHS	Work Health & Safety

2. Introduction

2.1 Background

This Compliance Monitoring and Reporting Program (CMRP) has been prepared for the Nepean Hospital Redevelopment Stage 1 Project – SSDA 8766 (the Project)

The Nepean Hospital Redevelopment Project – Stage 1 generally involves the demolition, bulk excavation, land remediation and the construction of a 14 Storey building consisting of approximately 57,000m2 of additional Gross Floor Area within the existing Nepean Hospital Campus, located in Kingswood, NSW, 2747.

The proposal involves the construction of a 14-storey hospital tower consisting of new and expanded hospital services to accommodate the growing demands of the community. The following table provides a level by level summary of the intended use for the proposed Stage 1 Tower.

Table 1 – Level by Level Intended Use Summary.

Location / Level	Works/Use
LV0	Emergency Department (ED), plant, Psychiatric Emergency Care Centre (PECC), central landscape courtyard, external car parking and travel space.
LV1	Administration unit, Cardiac Diagnostics Interventional Unit (CDIU) shell space, Front of House (FOH) areas, pedestrian link to existing hospital building and travel space.
LV2	Administration unit, Endoscopy space, Day of Surgery Admissions (DOSA) space, two pedestrian links to existing hospital building and travel space.
LV3	Operating theatre suites, Stage 1 recovery, two pedestrian links to existing hospital building and travel space.
LV4	Plant space, sterilising services, and travel space.
LV5	Intensive care unit (ICU) shell space, administration unit and travel space.
LV6	Neonatal Intensive Care Unit / Special Care Nursery services, Administration unit and travel space.
LV7	Birthing Suites and travel space.
LV8	Maternity Inpatient Units - 24 Bed wards x 2 and travel space.
LV9	Generic Inpatient Unit - 28 Bed wards x 2 and travel space.
LV10	Generic Inpatient Unit - 28 Bed wards x 2 and travel space.
LV11	Generic Inpatient Unit - 28 Bed wards x 2 and travel space.
LV12	Generic Inpatient Unit - 28 Bed wards x 2 and travel space.
LV13	Plant and travel space.
LV14	Helipad and travel space.

2.2 Purpose of this Report

The purpose of this Compliance Monitoring and Reporting Program is to satisfy condition B.40 of SSDA 8876 of the planning approval.

The requirements of the Compliance Monitoring and Reporting Program are listed in Table 1 below:

Table 2 – Conditions applicable to the PCCR

CoA	Requirement	Reference
B.40	No later than two weeks before the date notified for the commencement of construction, a Compliance Monitoring and Reporting Program prepared in accordance with the Compliance Reporting Post Approval Requirements (Department 2018) must be submitted to the Department and Certifying Authority.	This document

3. Compliance Reporting

The CoA B.40 requests that compliance reporting for the project are to be undertaken. The purpose of this document is to monitor and report on the compliance status of the project's performance to the conditions of consent.

3.1 Compliance Monitoring and Reporting Schedule

A Compliance Monitoring and Reporting Programme (CMPP) must contain a schedule which sets out the frequency of compliance monitoring and reporting as per the Compliance Reporting Post Approval Requirements (Department 2018)

Table 3 – Compliance Report Schedule

Compliance Report	Phase of Project	Timing of Report	Frequency
Compliance Monitoring and Reporting Program (This Report)	Pre-Construction Phase	Report is to be submitted to the Planning Secretary prior to the commencement of Constructions	Single Report
Construction Compliance Report	Construction Phase	Reporting throughout the duration of the Construction phase	At intervals, no greater than 26 weeks from the date of commencement. See below timetable for compliance reporting specific to this project
Pre-Operational Compliance Report	Pre-Operation	Report is to be submitted to the Planning Secretary Prior to commencement of Operation	Single Report
Operation Compliance Report	Operation	Reporting required for the duration of the operation	At intervals, no greater then 52 weeks from the date of the commencement
Post-Decommissioning Compliance Report	Decommissioning	Report to be submitted to the Planning Secretary within 12 weeks of completion of decommissioning	Single Report

As per the Compliance Reporting Post Approval Requirements (Department 2018), the Contractor is required to submit the Construction Compliance Reports at intervals, no greater than 26 weeks from the date of commencement. The following schedule outlines the proposed dates for the compliance reports to be undertaken and submitted to the DPE

Table 4 – Construction Compliance Report Due Dates

Reporting Number	Compliance Report	Due Date
1	Construction Compliance Report	31 May 2019
2	Construction Compliance Report	31 November 2019
3	Construction Compliance Report	31 May 2020
4	Construction Compliance Report	31 November 2020
5	Construction Compliance Report	31 May 2021
6	Construction Compliance Report	31 November 2021
7	Pre-Operation Compliance Report	31 November 2021
8	Operation Compliance Report	No greater than 52-week intervals from the date of commencement

3.2 Compliance Table

A Compliance Table will be prepared for each compliance review and be included as an appendix to the Compliance Report which will include:

- the applicable Conditions of Consent requirements for that phase,
- the evidence collected to determine whether the requirements have been complied and
- the status of compliance (Compliant / Non-Compliant / Not Triggered) as per the DPE Compliance Reporting Post Approval Requirements (June 2018).

A Compliance Table has been developed and included in **Appendix 1** which will be used for each of the Compliance Monitoring throughout the project

3.2 Compliance Monitoring and Reporting Schedule

An electronic copy of the final Compliance Reports findings will be emailed to the DPE via the email address compliance@planning.nsw.gov.au under the following email heading:

Nepean Hospital Redevelopment Stage 1 – SSDA 8766 Compliance Report_Day Month Year

Consistent with CoA B.42 *" The Applicant must make each Compliance Report publicly available 60 days after submitting it to the Department and notify the Department and the Certifying Authority in writing at least seven days before this is done"*, the Compliance Report will be available on the Nepean Hospital Redevelopment website - www.nepeanredevelopment.health.nsw.gov.au

Document Title Compliance Table
Version 0.1
Date 05-Apr-19

ID	Compliance Requirement	Responsibility	Phase of Development	Evidence to Assess & Determine Compliance (Methodology)	Commentary on Findings and Recommendations	Status of Compliance	Closed Out
	PART A - ADMINISTRATIVE CONDITIONS						
	Obligation to Minimise Harm to the Environment						
A1	A1. In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and, if prevention is not reasonable and feasible, minimise any material harm to the environment that may result from the construction and operation of the development.	Health Infrastructure / CPB Contractors	At all times	Include the mitigation and protection measures in the Environmental Management Plan.			
	Terms of Approval						
A2	A2. The development may only be carried out:						
A2-a	(a) in compliance with the conditions of this consent;						
A2-b	(b) in accordance with all written directions of the Planning Secretary;						
A2-c	(c) generally in accordance with the EIS and Response to Submissions;						
A2-d	(d) in accordance with the approved plans in the table below:						
	Architectural Plans Prepared by BVN						
	A0-106 B Demolition Plan 14/11/2018						
	A0-108 B Proposed Site Plan 14/11/2018						
	A0-200 B Lv 00 Floor Plan 14/11/2018						
	A0-201 B Lv 01 Floor Plan 14/11/2018						
	A0-202 B Lv 02 Floor Plan 14/11/2018						
	A0-203 B Lv 03 Floor Plan 14/11/2018						
	A0-204 B Lv 04 Floor Plan 14/11/2018						
	A0-205 B Lv 05 Floor Plan 14/11/2018						
	A0-206 B Lv 06 Floor Plan 14/11/2018						
	A0-207 B Lv 07 Floor Plan 14/11/2018						
	A0-208 B Lv 08 Floor Plan 14/11/2018						
	A0-209 B Lv 09 Floor Plan 14/11/2018						
	A0-210 B Lv 10 Floor Plan 14/11/2018						
	A0-211 B Lv 11 Floor Plan 14/11/2018						
	A0-212 B Lv 12 Floor Plan 14/11/2018						
	A0-213 B Lv 13 Floor Plan 14/11/2018						
	A0-214 B Lv 14 Floor Plan 14/11/2018						
	A0-215 B Lv 15 Roof Plan 14/11/2018						
	A0-216 B Lv B1 Floor Plan 14/11/2018						
	A0-220 A Lv 00 General Arrangement 14/11/2018						
	A0-221 A Lv 01 General Arrangement 14/11/2018						
	A0-222 A Lv 02 General Arrangement 14/11/2018						
	A0-223 A Lv 03 General Arrangement 14/11/2018						
	A0-224 A Lv 04 General Arrangement 14/11/2018						
	A0-225 A Lv 05 General Arrangement 14/11/2018						
	A0-226 A Lv 06 General Arrangement 14/11/2018						
	A0-227 A Lv 07 General Arrangement 14/11/2018						
	A0-228 A Lv 08 General Arrangement 14/11/2018						
	A0-229 A Lv 09 General Arrangement 14/11/2018						
	A0-230 A Lv 10 General Arrangement 14/11/2018						
	A0-231 A Lv 11 General Arrangement 14/11/2018						
	A0-232 A Lv 12 General Arrangement 14/11/2018						
	A0-233 A Lv 13 General Arrangement 14/11/2018						
	A0-234 A Lv 14 General Arrangement 14/11/2018						
	A0-235 A Lv Roof General Arrangement 14/11/2018						
	A0-236 A Lv B1 General Arrangement 14/11/2018						
	A0-300 B Elevations – North 14/11/2018						
	A0-301 B Elevations – South 14/11/2018						
	A0-302 B Elevations – West 14/11/2018						
	A0-303 B Elevations – East 14/11/2018						
	A0-310 B Building Sections 14/11/2018						
	A0-311 B Building Sections 14/11/2018						
	A0-350 B Material Sample Board 14/11/2018						
	Landscape Plans prepared by Arcadia Landscape Architecture						
	101 B Plant Schedule 21/08/2018						
	102 B Landscape Level 01 Forecourt 21/08/2018						
	103 B Landscape Level 01 Courtyard 2 21/08/2018						
	104 B Landscape level 0 Atrium 21/08/2018						
	105 B Landscape level 0 PECC Courtyard 21/08/2018						
	106 B Landscape Level 06 21/08/2018						
	- 4 Vision | Overall Master Plan August 2018						
	- 4 Vision | Stage One Landscape Plan August 2018						
	- 4 Vision | Rooftop Landscape Plan August 2018						
	Concept stormwater, sediment and erosion control plan prepared by Bonacci						
	NHR-BON-DRW- CIV-TB10000001 Rev C Drawing Register and Construction Notes 04/10/2018						
	NHR-BON-DRW- CIV-TB10001001 Rev C Soil and Water Management Plan Sheet 1 04/10/2018						
	NHR-BON-DRW- CIV-TB10001002 Rev C Soil and Water Management Plan Sheet 2 04/10/2018						
	NHR-BON-DRW- CIV-TB10001100 Rev B Soil and Water Management Details 31/06/2018						
	NHR-BON-DRW- CIV-TB10002001 Rev D Bulk Earthworks Plan Sheet 1 26/07/2018						
	NHR-BON-DRW- CIV-TB10002002 Rev D Bulk Earthworks Plan Sheet 2 24/07/2018						
	NHR-BON-DRW- CIV-TB10002101 Rev B Bulk Earthworks Longitudinal Sections Sheet 1 01/06/2018						
	NHR-BON-DRW- CIV-TB10002102 Rev C Bulk Earthworks Longitudinal Sections Sheet 2 01/06/2018						
	NHR-BON-DRW- CIV-TB10002103 Rev C Bulk Earthworks Longitudinal Sections Sheet 3 01/06/2018						
	NHR-BON-DRW- CIV-TB10002104 Rev B Bulk Earthworks Longitudinal Sections Sheet 4 01/06/2018						
	NHR-BON-DRW- CIV-TB10002105 Rev B Bulk Earthworks Longitudinal Sections Sheet 5 01/06/2018						
	NHR-BON-DRW- CIV-TB10002106 Rev B Bulk Earthworks Longitudinal Sections Sheet 6 19/04/2018						
	NHR-BON-DRW- CIV-TB10003001 Rev B Siteworks and Stormwater Drainage Plan Sheet 1 01/06/2018						
	NHR-BON-DRW- CIV-TB10003002 Rev C Siteworks and Stormwater Drainage Plan Sheet 2 23/07/2018						
	NHR-BON-DRW- CIV-TB10003011 Rev A Stormwater Drainage Longitudinal Sections Sheet 1 01/06/2018						
A3	A3. Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to:	Note	Note	Note	NA	NA	NA
A3-a	(a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary; and						
A3-b	(b) the implementation of any actions or measures contained in any such document referred to in (a) above.						
A4	A4. The conditions of this consent and directions of the Planning Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document listed in condition A2(c) or A2(d). In the event of an inconsistency, ambiguity or conflict between any of the documents listed in condition A2(c) and A2(d), the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.	Note	Note	Note	NA	NA	NA
	Limits of Consent						
A5	A5. This consent lapses five years after the date of consent unless the works associated with the development have physically commenced.	Note	Note	Note	NA	NA	NA

	Prescribed Conditions						
A6	A6. The Applicant must comply with all relevant prescribed conditions of development consent under Part 6, Division 8A of the EP&A Regulation.	CBRE/CPB Contractors	At all times	Ongoing review and status of the SSDA Matrix		NA	NA
	Planning Secretary as Moderator						
A7	A7. In the event of a dispute between the Applicant and a public authority, in relation to an applicable requirement in this approval or relevant matter relating to the Development, either party may refer the matter to the Planning Secretary for resolution. The Planning Secretary's resolution of the matter must be binding on the parties.	Note	Note	Note	NA	NA	NA
	Long Service Levy						
A8	A8. For work costing $25,000 or more, a Long Service Levy must be paid. For further information please contact the Long Service Payments Corporation Helpline on 131 441.	CPB Contractors	At all times	Pay the LSL and issue to the Certifier and CC received		NA	NA
	Legal Notices						
A9	A9. Any advice or notice to the consent authority must be served on the Planning Secretary.	Note	Note	Note		NA	NA
	Evidence of Consultation						
A10	A10. Where conditions of this consent require consultation with an identified party, the Applicant must:	Health Infrastructure / CPB Contractors	At All Times	Completed as part of the SSDA and evidence issued to the Building Certifier where required			
A10-a	(a) consult with the relevant party prior to submitting the subject document for information or approval; and						
A10-b	(b) provide details of the consultation undertaken including:						
A10-b(i)	(i) the outcome of that consultation, matters resolved and unresolved; and						
A10-b(ii)	(ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.						
	Staging, Combining and Updating Strategies, Plans or Programs						
A11	A11. With the approval of the Planning Secretary, the Applicant may:						
A11-a	(a) prepare and submit any strategy, plan or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program);	CPB Contractors	At all times	Staging Plans / Construction Management Plan to be agreed with the Certifiers			
A11-b	(b) combine any strategy, plan or program required by this consent (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined); and	CPB Contractors	At all times	Staging Plans / Construction Management Plan to be agreed with the Certifiers			
A11-c	(c) update any strategy, plan or program required by this consent (to ensure the strategies, plans and programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development).	CPB Contractors	At all times	Staging Plans / Construction Management Plan to be agreed with the Certifiers			
A12	A12. If the Planning Secretary agrees, a strategy, plan or program may be staged or updated without consultation being undertaken with all parties required to be consulted in the relevant condition in this consent.	CPB Contractors	At all times	Staging Plans / Construction Management Plan to be agreed with the Certifiers			
A13	A13. If approved by the Planning Secretary, updated strategies, plans or programs supersede the previous versions of them and must be implemented in accordance with the condition that requires the strategy, plan or program.	CPB Contractors	At all times	Staging Plans / Construction Management Plan to be agreed with the Certifiers			
	Demolition						
A14	A14. Demolition work must comply with Australian Standard AS 2601-2001 The demolition of structures (Standards Australia, 2001). The work plans required by AS 2601-2001 must be accompanied by a written statement from a suitably qualified person that the proposals contained in the work plan comply with the safety requirements of the Standard. The work plans and the statement of compliance must be submitted to the Certifying Authority before the commencement of works.	CPB Contractors	Prior to Construction Commencing (Demolition)	Issue proposal to the Certifying Authority with receipt of supporting documentation to address this consent			
	Structural Adequacy						
A15	A15. All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development, must be constructed in accordance with the relevant requirements of the BCA.	Health Infrastructure/CPB Contractors	All	Consultants to understand design requirements when designing all aspects of the development			
	External Walls and Cladding						
A16	A16. The external walls of all buildings including additions to existing buildings must comply with the relevant requirements of the BCA.	Note	Note	Consultants to understand design requirements when designing all aspects of the development			
	Applicability of Guidelines						
A17	A17. References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this consent.	Note	Note	Note	NA	NA	NA
A18	A18. However, consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.	Note	Note	Note	NA	NA	NA
	Monitoring and Environmental Audits						
A19	A19. Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non- compliance notification, Site audit report and independent auditing.	Note	Note	Note	NA	NA	NA
	Access to Information						
A20	A20. At least 48 hours before the commencement of construction until the completion of all works under this consent, or such other time as agreed by the Planning Secretary, the Applicant must:	CPB Contractors	At All Times	Folder to be kept in Site Office for SSDA Compliance			
A20-a	(a) make the following information and documents (as they are obtained or approved) publicly available on its website:						
A20-a(i)	(i) the documents referred to in condition A2 of this consent;						
A20-a(ii)	(ii) all current statutory approvals for the development;						
A20-a(iii)	(iii) all approved strategies, plans and programs required under the conditions of this consent;						
A20-a(iv)	(iv) regular reporting on the environmental performance of the development in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent;						
A20-a(v)	(v) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;						
A20-a(vi)	(vi) a summary of the current stage and progress of the development;						
A20-a(vii)	(vii) contact details to enquire about the development or to make a complaint;						
A20-a(viii)	(viii) a complaints register, updated monthly;						
A20-a(ix)	(ix) audit reports prepared as part of any independent audit of the development and the Applicant's response to the recommendations in any audit report;						
A20-a(x)	(x) any other matter required by the Planning Secretary; and						
A20-b	(b) keep such information up to date, to the satisfaction of the Planning Secretary.						
	Compliance						
A21	A21. The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.	CPB Contractors	At All Times	SSDA to be issued as a tender document			
	ADVISORY NOTES						
AN1	AN1. All licences, permits, approvals and consents as required by law must be obtained and maintained as required for the development. No condition of this consent removes any obligation to obtain, renew or comply with such licences, permits, approvals and consents	Note	Note	Note	NA	NA	NA
	PART B - PRIOR TO COMMENCEMENT OF CONSTRUCTION						
	Notification of Commencement						
B1	B1. The Department must be notified in writing of the dates of commencement of physical work and operation at least 48 hours before those dates	Health Infrastructure/CPB Contractors	Prior to Construction Commencing	CPB to notify HI of works commencing. HI to issue letter to DPE			
B2	B2. If the construction or operation of the development is to be staged, the Department must be notified in writing at least 48 hours before the commencement of each stage, of the date of commencement and the development to be carried out in that stage.	Health Infrastructure/CPB Contractors	Prior to Construction Commencing	CPB to notify HI of works commencing. HI to issue letter to DPE			
	Certified Drawings						
B3	B3. Prior to the commencement of construction, the Applicant must submit to the satisfaction of the Certifier structural drawings prepared and signed by a suitably qualified practising Structural Engineer that demonstrates compliance with:	CPB Contractors	Prior to Construction Commencing	Documents to be issued to the certifier and the Construction Certificate obtained.			
B3-a	(a) the relevant clauses of the BCA; and						
B3-b	(b) this development consent.						

	Reflectivity						
B4	B4. The building materials used on the facades of all buildings will be designed so as not to result in glare that causes discomfort or threatens the safety of pedestrians or drivers. A report/statement demonstrating consistency with this requirement will be submitted to the satisfaction of the Certifying Authority prior to the commencement of facade works.	CPB Contractors	Prior to Construction Commencing	Report to be issued by the Architect to the Building Certifier			
	External Walls and Cladding						
B5	B5. Prior to the commencement of construction, the Applicant must provide the Certifying Authority with documented evidence that the products and systems proposed for use or used in the construction of external walls, including finishes and claddings such as synthetic or aluminium composite panels, comply with the requirements of the BCA.	CPB Contractors	Prior to Construction Commencing	Report to be issued by the Architect to the Building Certifier			
B6	B6. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Planning Secretary within seven days after the Certifying Authority accepts it.	CPB Contractors	Prior to Construction Commencing	Statement to be provided by Certifying Authority with receipt of supporting documentation to address this consent			
	Protection of Public Infrastructure						
B7	B7. Before the commencement of construction, the Applicant must:						
B7-a	(a) consult with the relevant owner and provider of services that are likely to be affected by the development to make suitable arrangements for access to, diversion, protection and support of the affected infrastructure;	Health Infrastructure / CPB Contractors	Prior to Construction Commencing	Consult with relevant stakeholders			
B7-b	(b) prepare a dilapidation report identifying the condition of all public infrastructure in the vicinity of the site (including roads, gutters and footpaths); and	CPB Contractors	Prior to Construction Commencing	Complete Dilapidation Report			
B7-c	(c) submit a copy of the dilapidation report to the Planning Secretary, Certifying Authority and Council.	Health Infrastructure / CPB Contractors	Prior to Construction Commencing	Issue to Council, Planning Secretary & Certifying Authority and evidence sent to Certifier for Crown Cert.			
	Site Contamination						
B8	B8. Remediation approved as part of this development consent must be carried out in accordance with the Remedial Action Plan (54794/118777 - Rev O) dated 9/11/2018 and prepared by JBS & G.	CPB Contractors	Prior to Construction Commencing	Complete as per RAP.			
B9	B9. Prior to the commencement of earthworks, the Applicant must submit a Site Audit Report and Section A Site Audit Statement for the relevant part of the site prepared by a NSW EPA accredited Site Auditor. The Site Audit Report and Section A Site Audit Statement must verify the relevant part of the site is suitable for the hospital land use and be provided to the satisfaction of the Certifying Authority.	Health Infrastructure	Prior to Construction Commencing	Site Audit Report and Section A Site Audit Statement			
	Unexpected Contamination Procedure						
B10	B10. Prior to the commencement of earthworks, the Applicant must prepare an unexpected contamination procedure to ensure that potentially contaminated material is appropriately managed. The procedure must form part of the of the CEMP in accordance with condition B20 and must ensure any material identified as contaminated must be disposed off-site, with the disposal location and results of testing submitted to the Planning Secretary, prior to its removal from the site	CPB Contractors	Prior to Construction Commencing	Complete UFP and include in CEMP			
	Utilities and Services						
B11	B11. Before the construction of any utility works associated with the development, the Applicant must obtain relevant approvals from service providers.	Health Infrastructure	Prior to Construction Commencing	Discuss all works and obtain approval from			
B12	B12. Prior to the commencement of above ground works written advice must be obtained from the electricity supply authority, an approved telecommunications carrier and an approved gas carrier (where relevant) stating that satisfactory arrangements have been made to ensure provisions of adequate services.	Health Infrastructure	Prior to Construction Commencing	Discuss all works and obtain approval from			
	Community Communication Strategy						
B13	B13. A Community Communication Strategy must be prepared to provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction. The Community Communication Strategy must:	Health Infrastructure	Prior to Construction Commencing	Develop a Community Communication Report			
B13-a	(a) identify people to be consulted during the design and construction phases;						
B13-b	(b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;						
B13-c	(c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;						
B13-d	(d) set out procedures and mechanisms:						
B13-d(i)	(i) through which the community can discuss or provide feedback to the Applicant;						
B13-d(ii)	(ii) through which the Applicant will respond to enquiries or feedback from the community; and						
B13-d(iii)	(iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.						
B14	B14. The Community Communication Strategy must be submitted to the Planning Secretary for approval no later than two weeks before the commencement of any work.	Health Infrastructure	Prior to Construction	Submit to Planning Secretary for approval			
B15	B15. Work for the purposes of the development must not commence until the Community Communication Strategy has been approved by the Planning Secretary, or within another timeframe agreed with the Planning Secretary.	Health Infrastructure	Prior to Construction	Receive approval prior to construction			
	Ecologically Sustainable Development						
B16	B16. Within 6 months of the commencement of construction, the Applicant must register for a minimum 4 star Green Star rating with the Green Building Council Australia and submit evidence of registration to the Certifying Authority unless the NSW Health Engineering Services Guidelines are updated demonstrating equivalency with an accredited rating scheme to the satisfaction of the Planning Secretary.	CPB Contractors	During Construction	Develop report for achieving Greenstar Rating			
	Outdoor Lighting						
B17	B17. Prior to commencement of construction, all outdoor lighting within the site must comply with AS 1158.3.1:2005 Lighting for roads and public spaces – Pedestrian area (Category P) lighting – Performance and design requirements and AS 4282-1997 Control of the obtrusive effects of outdoor lighting. Lighting must comply with any recommendations of the review undertaken under Condition B44 to ensure the ongoing safe operation of the existing helipad on the site. Details demonstrating compliance with these requirements must be submitted to the satisfaction of the Certifying Authority.	CPB Contractors	Prior to Construction Commencing	Lighting to be designed by competent consultant who understands requirements of the SSDA.			
	Access for People with Disabilities						
B18	B18. The works that are the subject of this application must be designed and constructed to provide access and facilities for people with a disability in accordance with the BCA. Prior to the commencement of construction, the Certifying Authority must ensure that evidence of compliance with this condition from an appropriately qualified person is provided and that the requirements are referenced on any certified plans.	CPB Contractors	Prior to Construction Commencing	Access to be designed by competent consultant who understands requirements of the SSDA.			
	Environmental Management Plan Requirements						
B19	B19. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	CPB Contractors	Prior to Construction Commencing	Development of the Managing Plans			
B19-a	(a) detailed baseline data;						
B19-b	(b) details of:						
B19-b(i)	(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);						
B19-b(ii)	(ii) any relevant limits or performance measures and criteria; and						
B19-b(iii)	(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;						
B19-c	(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;						
B19-d	(d) a program to monitor and report on the:						
B19-d(i)	(i) impacts and environmental performance of the development;						
B19-d(ii)	(ii)effectiveness of the management measures set out pursuant to paragraph (c) above;						
B19-e	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;						
B19-f	(f) a program to investigate and implement ways to improve the environmental performance of the development over time;						
B19-g	(g) a protocol for managing and reporting any:						
B19-g(i)	(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);						
B19-g(ii)	(ii) complaint;						
B19-g(iii)	(iii) failure to comply with statutory requirements; and						
B19-h	(iii) a protocol for periodic review of the plan						

B20	B20. The Applicant must prepare a Construction Environmental Management Plan (CEMP) and it must include, but not be limited to, the following:	CPB Contractors	Prior to Construction Commencing	Development of the Environmental Management Plan			
B20-a	(a) Details of:						
B20-a(i)	(i) hours of work;						
B20-a(ii)	(ii) 24-hour contact details of site manager;						
B20-a(iii)	(iii) management of dust and odour to protect the amenity of the neighbourhood;						
B20-a(iv)	(iv) stormwater control and discharge;						
B20-a(v)	(v) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;						
B20-a(vi)	(vi) groundwater management plan including measures to prevent groundwater contamination;						
B20-a(vii)	(vii) external lighting in compliance with AS 4282-1997 Control of the obtrusive effects of outdoor lighting;						
B20-a(viii)	(viii) community consultation and complaints handling;						
B20-b	(b) Construction Traffic and Pedestrian Management Sub-Plan (see condition B22);						
B20-c	(c) Construction Noise and Vibration Management Sub-Plan (see condition B23);						
B20-d	(d) Construction Waste Management Sub-Plan (see condition B24);						
B20-e	(e) Construction Soil and Water Management Sub-Plan (see condition B25);						
B20-f	(f) Flood Emergency Response (see condition B26);						
B20-g	(g) an unexpected finds protocol for contamination and associated communications procedure;						
B20-h	(h) an unexpected finds protocol for Aboriginal and non-Aboriginal heritage and associated communications procedure;						
B20-i	(i) waste classification (for materials to be removed) and validation (for materials to remain) be undertaken to confirm the contamination status in these areas of the site; and						
B21	B21. The Applicant must not commence construction of the development until the CEMP is approved by the Certifying Authority and a copy submitted to the Planning Secretary.	CPB Contractors	Prior to Construction Commencing	Develop and issue the CEMP to the planning authority			
B22	B22. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must address, but not be limited to, the following:	CPB Contractors	Prior to Construction Commencing	Develop the Construction Traffic and Pedestrian Management Sub-Plan			
B22-a	(a) be prepared by a suitably qualified and experienced person(s);						
B22-b	(b) be prepared in consultation with relevant road authority;						
B22-c	(c) detail the measures that are to be implemented to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;						
B22-d	(d) detail heavy vehicle routes, access and parking arrangements;						
B22-e	(e) include a Driver Code of Conduct to:						
B22-e(i)	(i) minimise the impacts of earthworks and construction on the local and regional road network;						
B22-e(ii)	(ii) minimise conflicts with other road users;						
B22-e(iii)	(iii) minimise road traffic noise; and						
B22-e(iv)	(iv) ensure truck drivers use specified routes;						
B22-f	(f) include a program to monitor the effectiveness of these measures; and						
B22-g	(g) if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.						
B23	B23. The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following:	CPB Contractors	Prior to Construction Commencing	Develop the Construction Noise and Vibration Management Sub-Plan			
B23-a	(a) be prepared by a suitably qualified and experienced noise expert;						
B23-b	(b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009);						
B23-c	(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;						
B23-d	(d) include strategies that have been developed with the community for managing high noise generating works;						
B23-e	(e) describe the community consultation undertaken to develop the strategies in condition B23(d); and						
B23-f	(f) include a complaints management system that would be implemented for the duration of the construction.						
B24	B24. The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the following:	CPB Contractors	Prior to Construction Commencing	Develop the Construction Waste Management Sub-Plan			
B24-a	(a) detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations;						
B24-b	(b) removal of hazardous materials, particularly the method of containment and control of emission of fibres to the air, and disposal at an approved waste disposal facility in accordance with the requirements of the relevant legislation, codes, standards and guidelines, prior to the commencement of any building works.						
B25	B25. The Applicant must prepare a Construction Soil and Water Management Plan (CSWMSP) and the plan must address, but not be limited to the following:	CPB Contractors	Prior to Construction Commencing	Develop the Construction Soil and Water Management Plan			
B25-a	(a) be prepared by a suitably qualified expert, in consultation with Council;						
B25-b	(b) describe all erosion and sediment controls to be implemented during construction;						
B25-c	(c) provide a plan of how all construction works will be managed in a wet-weather events (i.e. storage of equipment, stabilisation of the Site);						
B25-d	(d) detail all off-Site flows from the Site; and						
B25-e	(e) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 1-year ARI, 1 in 5-year ARI and 1 in 100-year ARI).						
B26	B26. The Flood Emergency Response Sub-Plan (FERSP) must address, but not be limited to, the following:	CPB Contractors	Prior to Construction Commencing	Develop the Flood Emergency Response Sub-Plan			
B26-a	(a) be prepared by a suitably qualified and experienced person(s);						
B26-b	(b) address the provisions of the Floodplain Risk Management Guideline (OEH, 2007);						
B26-c	(c) include details of:						
B26-c(i)	(i) the flood emergency responses for both construction and operation phases of the development;						
B26-c(ii)	(ii) predicted flood levels;						
B26-c(iii)	(iii) flood warning time and flood notification;						
B26-c(iv)	(iv) assembly points and evacuation routes;						
B26-c(v)	(v) evacuation and refuge protocols; and						
B26-c(vi)	(vi) awareness training for employees and contractors, and students.						
	Construction Parking						
B27	B27. Prior to the commencement of construction, the Applicant must provide sufficient parking facilities for heavy vehicles on-site (unless alternative parking is agreed to in writing from the relevant road authority) and ensure that construction traffic associated with the development minimises on-street parking or the use of public parking facilities.	CPB Contractors	Prior to Construction Commencing	Traffic Consultant to confirm sufficient parking			
	Road Design and Traffic Facilities						
B28	B28. All roads and traffic facilities must be designed to meet the requirements of Council or RMS (whichever is applicable). The necessary permits and approvals from the relevant road authority must be obtained prior to the commencement of road or pavement construction works.	CPB Contractors	Where applicable	Traffic Consultant to confirm sufficient parking with relevant consultant			
	Stormwater Management System						
B29	B29. Prior to the commencement of construction, the Applicant must design an operational stormwater management system for the development and submit it to the satisfaction of the Certifying Authority. The system must:	CPB Contractors	Prior to Commencing Construction	Civil designer to incorporate SSDA conditions in design			
B29-a	(a) be designed by a suitably qualified and experienced person(s);						
B29-b	(b) be generally in accordance with the conceptual design in the EIS as modified in the RtS;						
B29-c	(c) be in accordance with applicable Australian Standards;						
B29-d	(d) be designed in accordance with Council's Stormwater Drainage for Building Developments and Water Sensitive Urban Design Policy. The stormwater drainage plans must include site specific cross-sections and plan view details for all stormwater treatment measures;						
B29-e	(e) ensure that the system capacity has been designed in accordance with *Australian Rainfall and Runoff* (Engineers Australia, 2016) and *Managing Urban Stormwater: Council Handbook* (EPA, 1997) guidelines;						
B29-f	(f) divert existing clean surface water around operational areas of the site;						
B29-g	(g) direct all sediment laden water in overland flow away from the leachate management system;						
B29-h	(h) prevent cross-contamination of clean and sediment or leachate laden water.						

	Operational Noise – Design of Mechanical Plant and Equipment						
B30	B30. Prior to commencement of construction, the Applicant must incorporate the noise mitigation recommendations in the Acoustic Assessment (Rev 9) prepared by Acoustic Logic dated 15/11/2018, into the detailed design drawings. The Certifying Authority must verify that all reasonable and feasible noise mitigation measures have been incorporated into the design to ensure the development will not exceed the recommended operational noise levels identified in the Acoustic Assessment (Rev 9) prepared by Acoustic Logic dated 15/11/2018.	CPB Contractors	Prior to Commencing Construction	Update to the Construction Noise and Vibration Management Sub-Plan			
	Biodiversity						
B31	B31. Prior to any clearing or construction works, the Applicant must purchase and 2 ecosystem credits to offset the removal of native vegetation on site. The ecosystem credits must be determined in accordance with the OEH's Framework for Biodiversity Assessment (FBA) and the Biobanking Assessment Methodology 2014 (BBAM).	Health Infrastructure	Prior to Commencing Construction / Clearing	Purchase 2 ecosystem credits			
	Construction and Demolition Waste Management						
B32	B32. The Applicant must notify the RMS Traffic Management Centre of the truck route(s) to be followed by trucks transporting waste material from the site, prior to the commencement of the removal of any waste material from the site.	CPB Contractors	Prior to Commencing Construction	Traffic Consultant to liaise with RMS and advise truck routes.			
	Operational Waste Storage and Processing						
B33	B33. Prior to the commencement of construction, the Applicant must obtain agreement from Council for the design of the operational waste storage area where waste removal is undertaken by Council.	Health Infrastructure	Prior to Commencing Construction	Discuss operation waste storage with Council			
	Mechanical Ventilation						
B34	B34. All mechanical ventilation systems must be designed in accordance with Part F4.5 of the BCA and must comply with the AS 1668.2-2012 The use of air-conditioning in buildings – Mechanical ventilation in buildings and AS/NZS 3666.1:2011 Air handling and water systems of buildings– Microbial control to ensure adequate levels of health and amenity to the occupants of the building and to ensure environment protection. Details must be submitted to the satisfaction of the Certifying Authority prior to the commencement of construction.	CPB Contractors	During Construction	Consultant to understand conditions in the SSDA and incorporate in design.			
	Rainwater Harvesting						
B35	B35. Prior to the commencement of construction, the Applicant must ensure that a rainwater reuse/harvesting system for the development is developed for the site. A rainwater re-use plan must be prepared and certified by an experienced hydraulic engineer.	CPB Contractors	Prior to Commencing Construction	Consultant to understand conditions in the SSDA and incorporate in design.			
	Roadworks and Access						
B36	B36. Prior to the commencement of construction, the Applicant must submit design plans to the satisfaction of the relevant roads authority which demonstrate that the proposed accesses to the development are designed to accommodate the turning path of the largest vehicle accessing the site.	CPB Contractors	Prior to Commencing Construction	Traffic Consultant to develop the Construction Traffic and Pedestrian Management Sub-Plan			
	Car Parking and Service Vehicle Layout						
B37	B37. Compliance with the following requirements must be submitted to the satisfaction of the Certifying Authority prior to the commencement of construction:	Health Infrastructure/CPB Contractors	Prior to Commencing Construction	Design consultant to understand requirements of the SSDA and develop the design accordingly			
B37-a	(a) all vehicles must enter and leave the Site in a forward direction;						
B37-b	(b) minimum of 59 on-site car parking spaces for use during operation of the development and designed in accordance with the latest version of AS2890.1;						
B37-c	(c) the swept path of the longest vehicle entering and exiting the Site in association with the new work, as well as manoeuvrability through the Site, must be in accordance with AUSTROADS; and						
B37-d	(d) the safety of vehicles and pedestrians accessing adjoining properties, where shared vehicle and pedestrian access occurs, is to be addressed.						
	Bicycle Parking and End-of-Trip Facilities						
B38	B38. Compliance with the following requirements for secure bicycle parking and end-of-trip facilities must be submitted to the satisfaction of the Certifying Authority prior to the commencement of construction:	Health Infrastructure	Prior to Commencing Construction	Design consultant to understand requirements of the SSDA and develop the design accordingly			
B38-a	a) the provision of a minimum 25 bicycle parking spaces;						
B38-b	b) the layout, design and security of bicycle facilities must comply with the minimum requirements of AS 2890.3:2015 *Parking facilities - Bicycle parking* , and be located in easy to access, well-lit areas that incorporate passive surveillance;						
B38-c	c) the provision of end-of-trip facilities for staff in accordance with the ESD Design & As Built rating tool;						
B38-d	d) appropriate pedestrian and cyclist advisory signs are to be provided; and						
B38-e	e) all works/regulatory signposting associated with the proposed developments shall be at no cost to the relevant roads authority.						
	Public Domain Works						
B39	B39. Prior to the commencement of any footpath or public domain works, the Applicant must consult with Council and demonstrate to the Certifying Authority that the streetscape design and treatment meets the requirements of Council, including addressing pedestrian management. The Applicant must submit documentation of approval for each stage from Council to the Certifying Authority.	CPB Contractors	Where applicable	Liaise with Council			
	Compliance Reporting						
B40	B40. No later than two weeks before the date notified for the commencement of construction, a Compliance Monitoring and Reporting Program prepared in accordance with the Compliance Reporting Post Approval Requirements (Department 2018) must be submitted to the Department and the Certifying Authority.	Health Infrastructure	Prior to Construction Commencing	Develop Compliance Report			
B41	B41. Compliance Reports of the project must be carried out in accordance with the Compliance Reporting Post Approval Requirements (Department 2018).						
B42	B42. The Applicant must make each Compliance Report publicly available 60 days after submitting it to the Department and notify the Department and the Certifying Authority in writing at least seven days before this is done.		Ongoing	Make report publicly available			
B43	B43. Notwithstanding the requirements of the Compliance Reporting Post Approval Requirements (Department 2018), the Planning Secretary may approve a request for ongoing annual operational compliance reports to be ceased, where it has been demonstrated to the Planning Secretary's satisfaction that an operational compliance report has demonstrated operational compliance	Note	Note	Note	NA	NA	NA
	Existing Helipad / Helicopter Operations During Construction						
B44	B44. Prior to the commencement of construction, helipad / helicopter operations at the site are to be reviewed by a suitably qualified and experienced aviation professional in consultation with relevant stakeholders. The review must consider the proposed construction methodology including plant and equipment to be used (including lighting and cranes) and recommend changes to the construction methodology and / or flight paths where required to ensure safe ongoing helicopter operations at the site. A report summarising the outcome of the review must be submitted to the Certifying Authority.	CPB Contractors	Prior to Construction Commencing (Helipad)	Aviation Consultant to develop the report to satisfy this condition			
	Proposed Helipad Design						
B45	B45. Prior to the construction of the proposed helipad, a report prepared by a suitably qualified and experienced aviation professional must be submitted to the satisfaction of the Certifying Authority which states that the design of the helipad incorporates the relevant details outlined in Civil Aviation Safety Authority Civil Aviation Advisory Publication CAAP 92-2(2) Guidelines for the establishment and other relevant National and International guidelines.	CPB Contractors	Prior to Construction Commencing (Helipad)	Aviation Consultant to develop the report to satisfy this condition			
	Proposed Helipad Operations						
B46	B46. Prior to the construction of the helipad, future ongoing helicopter operations to the site are to be reviewed by a suitably qualified and experienced aviation professional. Proposed flight paths to the helipad shall be identified in consultation with relevant stakeholders in accordance with Civil Aviation Safety Authority Civil Aviation Advisory Publication CAAP 92-2(2) Guidelines for the establishment and other relevant National and International guidelines. A report summarising the outcome of the review and a Three-dimensional Visual Flight Rules Approach and Departure Path and Transitional Surface Survey must be submitted to the satisfaction of Certifying Authority and a copy submitted to the Department and Council.	CPB Contractors	Prior to Construction Commencing (Helipad)	Aviation Consultant to review the ongoing helipad operations			

PART C - DURING CONSTRUCTION							
	Approved Plans to be On-site						
C1	C1. A copy of the approved and certified plans, specifications and documents incorporating conditions of approval and certification must be kept on the Site at all times and must be readily available for perusal by any officer of the Department, Council or the Certifying Authority.	CPB Contractors	At All Times	Folder to be kept in Site Office for SSDA Compliance			
	Site Notice						
C2	C2. A site notice(s):	CPB Contractors	At All Times	Signage to be posted at the site boundary			
C2-a	(a) must be prominently displayed at the boundaries of the site for the purposes of informing the public of project details including, but not limited to the details of the Builder, Certifying Authority and Structural Engineer.						
C2-b	(b) is to satisfy all but not be limited to, the following requirements:						
C2-b(i)	(i) minimum dimensions of the notice must measure 841 mm x 594 mm (A1) with any text on the notice to be a minimum of 30-point type size;						
C2-b(ii)	(ii) the notice is to be durable and weatherproof and is to be displayed throughout the works period;						
C2-b(iii)	(iii) the approved hours of work, the name of the site/ project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries, including construction/ noise complaint must be displayed on the site notice; and						
C2-b(iv)	(iv) the notice(s) is to be mounted at eye level on the perimeter hoardings/fencing and is to state that unauthorised entry to the site is not permitted.						
	Operation of Plant and Equipment						
C3	C3. All plant and equipment used on site, or to monitor the performance of the development must be:	CPB Contractors	At All Times	Maintenance and operation checks			
C3-a	a) maintained in a proper and efficient condition; and						
C3-b	b) operated in a proper and efficient manner.						
	Demolition						
C4	C4. Demolition work must comply with Australian Standard AS 2601-2001 The demolition of structures (Standards Australia, 2001). The work plans required by AS 2601-2001 must be accompanied by a written statement from a suitably qualified person that the proposals contained in the work plan comply with the safety requirements of the Standard. The work plans and the statement of compliance must be submitted to the Certifying Authority before the commencement of works.	CPB Contractors	Prior to Construction Commencing	Qualified personnel			
	Construction Hours						
C5	C5. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours: (a) between 7am and 6pm, Mondays to Fridays inclusive; and (b) between 7am and 5pm, Saturdays. No work may be carried out on Sundays or public holidays.	CPB Contractors	At All Times	Manage the site in accordance with the approved hours.			
C6	C6. Activities may be undertaken outside of the hours in condition C5 if required:	CPB Contractors	At all times	Include in emergency procedure			
C6-a	(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or						
C6-b	(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or						
C6-c	(c) where the works are inaudible at the nearest sensitive receivers; or						
C6-d	(d) where a variation is approved in advance in writing by the Planning Secretary or her nominee if appropriate justification is provided for the works.						
C7	C7. Notification of such activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards.	CPB Contractors	At all times	Include in emergency procedure			
C8	C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours: (a) 9am to 12pm, Monday to Friday; (b) 2pm to 5pm Monday to Friday; and (c) 9am to 12pm, Saturday.	CPB Contractors	At all times	Manage the site in accordance with the approved hours.			
	Implementation of Management Plans						
C9	C9. The Applicant must carry out the construction of the development in accordance with the most recent version of the approved CEMP (including Sub-Plans).	CPB Contractors	At all times	Implementation of the CEMP			
	Construction Traffic						
C10	C10. All construction vehicles (excluding worker vehicles) are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site before stopping, unless directed by traffic control.	CPB Contractors	At all times	Implement in Management Plans and monitor onsite			
	Road Occupancy Licence						
C11	C11. A Road Occupancy Licence must be obtained from the relevant road authority for any works that impact on traffic flows during construction activities.	CPB Contractors	At All Times (where applicable)	Application and approval of the Road Occupancy Licence			
	SafeWork Requirements						
C12	C12. To protect the safety of work personnel and the public, the work site must be adequately secured to prevent access by unauthorised personnel, and work must be conducted at all times in accordance with relevant SafeWork requirements.	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
	Hoarding Requirements						
C13	C13. The following hoarding requirements must be complied with:	CPB Contractors	At All Times	Hoarding only to be installed inside the project and approved template for all HI branding			
C13-a	(a) no third-party advertising is permitted to be displayed on the subject hoarding/ fencing;						
C13-b	(b) the construction site manager must be responsible for the removal of all graffiti from any construction hoardings or the like within the construction area within 48 hours of its application; and						
C13-c	(c) the Applicant must submit a hoarding application to Council for the installation of any hoardings over Council footways or road reserve.						
	No Obstruction of Public Way						
C14	C14. The public way (outside of any approved construction works zone) must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances. Non-compliance with this requirement will result in the issue of a notice by the relevant Authority to stop all works on site.	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
C15	C15. The development must be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures identified in the approved Construction Noise and Vibration Management Plan.	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
C16	C16. The Applicant must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C5.	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
C17	C17. The Applicant must implement, where practicable and without compromising the safety of construction staff or members of the public, the use audible movement alarms of a type that would minimise noise impacts on surrounding noise sensitive receivers.	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
C18	C18. Any noise generated during construction of the development must not be offensive noise within the meaning of the Protection of the Environment Operations Act 1997 or exceed approved noise limits for the site.	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
C19	C19. To provide a noise barrier during works, a Temporary 2.7m high solid noise screen around the permitter of the child care centre area is to be erected and managed during the demolition and construction.	CPB Contractors	Prior to Construction Commencing (Where applicable)	Construct Hoarding between CPB site and Childcare Centre			
	Vibration Criteria						
C20	C20. Vibration caused by construction at any residence or structure outside the site must be limited to:	CPB Contractors	At all times	Implementation of the Noise and Vibration Management Plan.			
C20-a	(a) for structural damage, the latest version of *DIN 4150-3 (1992-02) Structural vibration -Effects of vibration on structures (German Institute for Standardisation, 1999); and*						
C20-b	(b) for human exposure, the acceptable vibration values set out in the *Environmental Noise Management Assessing Vibration: a technical guideline* (DEC, 2006) (as may be updated or replaced from time to time).						
C21	C21. Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in condition C20.						
C22	C22. The limits in conditions C20 and C21 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition B23 of this consent.						

	Detailed Site Investigation						
C23	C23. Following the demolition of any existing structures, infrastructure and in ground utilities, the Applicant is to carry out further investigation of soil contamination (including within the footprint and immediate surrounds of those structures, infrastructures and utilities prior to undertaking any construction) to address any contamination with regard to the following:	CPB Contractors	Prior to Construction Commencing	Follow the existing RAP and update as required			
C23-a	(a) NSW EPA Sampling Design Guidelines;						
C23-b	(b) Guidelines for the NSW Site Auditor Scheme (3rd edition) 2017;						
C23-c	(c) Guidelines for Consultants Reporting on Contamination Sites, 2011; and						
C23-d	(d) The National Environment Protection (Assessment of Contamination) Measure.						
C24	C24. The RAP must be updated based on the findings of the further site investigation constructed once existing buildings are demolished on the site.						
	Tree Protection						
C25	C25. For the duration of the construction works:						
C25-a	(a) street trees must not be trimmed or removed unless it forms a part of this development consent or prior written approval from Council is obtained or is required in an emergency to avoid the loss of life or damage to property;	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
C25-b	(b) any tree on the footpath, which is damaged or removed during construction due to an emergency, must be replaced, to the satisfaction of Council;	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
C25-c	(c) all trees on the site that are not approved for removal must be suitably protected during construction as per recommendations of the Arboricultural Development Assessment Report prepared by Moore Trees Arboricultural Services dated 26/11/2018; and	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
C25-d	(d) if access to the area within any protective barrier is required during the works, it must be carried out under the supervision of a qualified arborist. Alternative tree protection measures must be installed, as required. The removal of tree protection measures, following completion of the works, must be carried out under the supervision of a qualified arborist and must avoid both direct mechanical injury to the structure of the tree and soil compaction within the canopy or the limit of the former protective fencing, whichever is the greater.	CPB Contractors	At All Times	Implementation of requirements in induction, supervision and audits.			
	Dust Minimisation						
C26	C26. The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.	CPB Contractors	During Construction	Include mitigation measures in Environmental Plan			
C27	C27. During construction, the Applicant must ensure that:						
C27-a	(a) exposed surfaces and stockpiles are suppressed by regular watering;						
C27-b	(b) all trucks entering or leaving the site with loads have their loads covered;						
C27-c	(c) trucks associated with the development do not track dirt onto the public road network;						
C27-d	(d) public roads used by these trucks are kept clean; and						
C27-e	(e) land stabilisation works are carried out progressively on site to minimise exposed surfaces.						
	Air Quality Discharges						
C28	C28. The Applicant must install and operate equipment in line with best practice to ensure that the development complies with all load limits, air quality criteria/air emission limits and air quality monitoring requirements as specified in the EPL applicable to the site.	CPB Contractors	During Construction	Include mitigation measures in Environmental Plan			
	Erosion and Sediment Control						
C29	C29. All erosion and sediment control measures, must 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 have been stabilised and rehabilitated so that it no longer acts as a source of sediment.	CPB Contractors	During Construction	Include mitigation measures in Environmental Plan			
	Imported Soil						
C30	C30. The Applicant must:	CPB Contractors	During Construction	Include mitigation measures in Environmental Plan			
C30-a	(a) ensure that only VENM, ENM, or other material approved in writing by EPA is brought onto the site;						
C30-b	(b) keep accurate records of the volume and type of fill to be used; and						
C30-c	(c) make these records available to the [Department/Certifying Authority] upon request.						
	Disposal of Seepage and Stormwater						
C31	C31. Any seepage or rainwater collected on-site during construction or groundwater must not be pumped to the street stormwater system unless separate prior approval is given in writing by the EPA in accordance with the Protection of the Environment Operations Act 1997.	CPB Contractors	During Construction	Receive approval prior to pumping			
	Unexpected Finds Protocol – Aboriginal Heritage						
C32	C32. In the event that surface disturbance identifies a new Aboriginal object, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the objects. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by OEH and the management outcome for the site included in the information provided to AHIMS. The Applicant must consult with the Aboriginal community representatives, the archaeologists and OEH to develop and implement management strategies for all objects/sites. Works shall only recommence with the written approval of OEH.	CPB Contractors	Prior to Construction Commencing	Implementation of requirements in induction, supervision and audits.			
	Waste Storage and Processing						
C33	C33. If any unexpected archaeological relics are uncovered during the work, then all works must cease immediately in that area and the OEH Heritage Division contacted. Depending on the possible significance of the relics, an archaeological assessment and management strategy may be required before further works can continue in that area. Works may only recommence with the written approval of Heritage Division of the OEH.	CPB Contractors	During Construction	Include mitigation measures in Environmental Plan			
C34	C34. Waste must be secured and maintained within designated waste storage areas at all times and must not leave the site onto neighbouring public or private properties.						
C35	C35. All waste generated during construction must be assess, classified and managed in accordance with the Waste Classification Guidelines Part 1: Classifying Waste (EPA, 2014).						
C36	C36. The body of any vehicle or trailer used to transport waste or excavation spoil must be covered before leaving the premises to prevent any spillage or escape of any dust, waste of spoil. Mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the site must be removed before leaving the premises.						
C37	C37. The Applicant must ensure that concrete waste and rinse water are not disposed of on the site and are prevented from entering any natural or artificial watercourse.						
	Handling of Asbestos						
C38	C38. The Applicant is to consult with SafeWork NSW concerning the handling of any asbestos waste that may be encountered during construction. The requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 – 'Transportation and management of asbestos waste' must also be complied with.	Note	Note	Note	NA	NA	NA
	Independent Environmental Audit						
C39	C39. Proposed independent auditors must be agreed to in writing by the Planning Secretary prior to the preparation of an Independent Audit Program or commencement of an Independent Audit.	Health Infrastructure	Prior to Construction Commencing	Engagement of a Independent Auditors & Program			
C40	C40. No later than four weeks before the date notified for the commencement of construction, an Independent Audit Program prepared in accordance with the Independent Audit Post Approval Requirements (Department 2018) must be submitted to the Department and the Certifying Authority.	Health Infrastructure	Prior to Construction Commencing	Independent Audit Report, Program and Table			
C41	C41. Table 1 of the Independent Audit Post Approval Requirements (Department 2009) is amended so that the frequency of audits required in the construction phase is:	Note	Note	NA	NA	NA	NA
C41-a	(a) An initial construction Independent Audit must be undertaken within eight weeks of the notified commencement date of construction; and						
C41-b	(b) A subsequent Independent Audit of construction must be undertaken no later than six months from the date of the initial construction Independent Audit.						
C42	C42. In all other respects Table 1 remains the same. The Planning Secretary may require the initial and subsequent Independent Audits to be undertaken at different times to those specified above, upon giving at least 4 weeks notice to the applicant of the date upon which the audit must be commenced.	Note	Note	NA	NA	NA	NA
C43	C43. Independent Audits of the development must be carried out in accordance with:	Note	Note	NA	NA	NA	NA
C43-a	(a) the Independent Audit Program submitted to the Department and the Certifying Authority under condition C39 of this consent; and						
C43-b	(b) the requirements for an Independent Audit Methodology and Independent Audit Report in the Independent Audit Post Approval Requirements (Department 2018).						
C44	C44. In accordance with the specific requirements in the Independent Audit Post Approval Requirements (Department 2018), the Applicant must:	Note	Note	NA	NA	NA	NA
C44-a	(a) review and respond to each Independent Audit Report prepared under condition C41 of this consent;						
C44-b	(b) submit the response to the Department and the Certifying Authority; and						

C44-c	(c) make each Independent Audit Report and response to it publicly available within 60 days after submission to the Department and notify the Department and the Certifying Authority in writing at least seven days before this is done.						
C45	C45. Notwithstanding the requirements of the Independent Audit Post Approval Requirements (Department 2018), the Planning Secretary may approve a request for ongoing annual operational audits to be ceased, where it has been demonstrated to the Planning Secretary's satisfaction that an audit has demonstrated operational compliance.	Note	Note	NA	NA	NA	NA
	Incident Notification, Reporting and Response						
C46	C46. The Department must be notified in writing to compliance@planning.nsw.gov.au immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one), and set out the location and nature of the incident.	Health Infrastructure/CPB Contractors	During Construction	Report all incidents to Health Infrastructure for elevation to the Department			
C47	C47. Subsequent notification must be given and reports submitted in accordance with the requirements set out in Appendix 1.						
	Non-Compliance Notification						
C48	C48. The Department must be notified in writing to compliance@planning.nsw.gov.au within seven days after the Applicant becomes aware of any non-compliance. The Certifying Authority must also notify the Department in writing to compliance@planning.nsw.gov.au within seven days after they identify any non-compliance.	Health Infrastructure/CPB Contractors	During Construction	Report all non-compliances to Health Infrastructure for elevation to the Department			
C49	C49. The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.						
C50	C50. A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.						
	Revision of Strategies, Plans and Programs						
C51	C51. Within three months of:						
C51-a	(a) the submission of a compliance report under condition B40;						
C51-b	(b) the submission of an incident report under condition C46;						
C51-c	(c) the submission of an Independent Audit under condition C43;						
C51-d	(d) the approval of any modification of the conditions of this consent; or						
C51-e	(e) the issue of a direction of the Planning Secretary under condition A2 which requires a review,						
C51	the strategies, plans and programs required under this consent must be reviewed, and the Department and the Certifying Authority must be notified in writing that a review is being carried out.	Note	Note	Review within 3 month period			
C52	C52. If necessary to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval within six weeks of the review.						
	Operational Noise – Design of Mechanical Plant and Equipment						
C53	C53. Prior to commencement of the installation and associated construction of plant and equipment, a detailed operational noise and vibration impact assessment shall be submitted to the Certifying Authority and the Department. The assessment must:	CPB Contractors	During Construction	Develop noise and vibration assessment			
C53-a	(a) prepared by a suitably qualified person.						
C53-b	(b) detail the operational noise and vibration sources and activities, including mechanical plant.						
C53-c	(c) outline all feasible and reasonable noise and vibration mitigation and management measures to be implemented.						
C53-d	(d) demonstrate that noise levels will not exceed the recommended operational noise levels identified in the Acoustic Assessment Report (Rev 9) prepared by Acoustic Logic dated 15/11/2018.						
C53	The Applicant must incorporate the noise mitigation recommendations in the Acoustic Assessment Report (Rev 9) prepared by Acoustic Logic dated 15/11/2018 into the detailed design drawings.						
C53	The Certifying Authority must verify that all reasonable and feasible noise mitigation measures have been incorporated into the design to ensure the development will not exceed the recommended operational noise levels identified in the Acoustic Report.						
	PART D - PRIOR TO OCCUPATION OR COMMENCEMENT OF USE						
	Notification of Occupation						
D1	D1. The date of commencement of the occupation of the development must be notified to the Department in writing, at least one month before occupation. If the operation of the development is to be staged, the Department must be notified in writing at least one month before the commencement of each stage, of the date of commencement and the development to be carried out in that stage.	Health Infrastructure	Prior to Occupation	Notification letter to DPE of the date of commencement of the occupation			
	External Walls and Cladding						
D2	D2. Prior to the occupation of the building, the Applicant must provide the Certifying Authority with documented evidence that the products and systems used in the construction of external walls including finishes and claddings such as synthetic or aluminium composite panels comply with the requirements of the BCA.	CPB Contractors	Prior to Occupation	Issue all required documentation and complete regular inspection by the Certifier			
D3	D3. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Planning Secretary within seven days after the Certifying Authority accepts it.						
	Post-construction Dilapidation Report						
D4	D4. Prior to occupation of the building, the Applicant must engage a suitably qualified person to prepare a post-construction dilapidation report at the completion of construction. This report is:	CPB Contractors	Prior to Occupation	Engage consultant to develop dilapidation report			
D4-a	a) to ascertain whether the construction created any structural damage to adjoining buildings or infrastructure.						
D4-b	b) to be submitted to the Certifying Authority. In ascertaining whether adverse structural damage has occurred to adjoining buildings or infrastructure, the Certifying Authority must:						
D4-b(i)	i) compare the post-construction dilapidation report with the pre-construction dilapidation report required by these conditions; and						
D4-b(ii)	ii) have written confirmation from the relevant authority that there is no adverse structural damage to their infrastructure and roads.						
D4-c	c) to be forwarded to Council.						
	Protection of Public Infrastructure						
D5	D5. Unless the Applicant and the applicable authority agree otherwise, the Applicant must:	CPB Contactors	During Construction	Monitor works against Dilap report			
D5-a	(a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by carrying out the development; and						
D5-b	(b) relocate, or pay the full costs associated with relocating any infrastructure that needs to be relocated as a result of the development.						
	Utilities and Services						
D6	D6. Prior to occupation of the building, the Applicant must obtain a Compliance Certificate for water and sewerage infrastructure servicing of the site under section 73 of the Sydney Water Act 1994.	CPB Contractors	Prior to Occupation	All compliance documentation to be received			
	Roadworks and Access						
D7	D7. The Applicant must complete the new Somerset Street access works prior to operation of the development to the satisfaction of Council.	CPB Contractors	Prior to Occupation	Receive approval prior to construction			
	Works as Executed Plans						
D8	D8. Prior to occupation of the building, works-as-executed drawings signed by a registered surveyor demonstrating that is in accordance with Council's Engineering Construction Specification for Civil Works, Water Sensitive Urban Design Technical Guidelines and Stormwater Drainage for Building Developments, and finished ground levels have been constructed as approved, must be submitted to the Certifying Authority.	CPB Contractors	Prior to Occupation	Complete Works as Executed drawings by a Registered surveyor			
	Green Travel Plan						
D9	D9. Prior to the commencement of operation, a Green Travel Plan (GTP), must be prepared and be submitted to the Secretary to promote the use of active and sustainable transport modes. The plan must:	Health Infrastructure	Prior to Occupation	Green Travel Plan			
D9-a	(a) be prepared by a suitably qualified traffic consultant in consultation with (Sydney Coordination Office) Transport for NSW;						
D9-b	(b) include objectives and modes share targets (i.e. Site and land use specific, measurable and achievable and timeframes for implementation) to define the direction and purpose of the GTP;						
D9-c	(c) set out measures to encourage staff to park in dedicated staff car parks;						
D9-d	(d) outline facilities and measures to promote public transport usage, car share schemes and employee incentives;						

D9-e	(e) include measures to promote and support the implementation of the plan, including financial and human resource requirements, roles and responsibilities for relevant employees involved in the implementation of the GTP; and						
D9-f	(f) describe pedestrian and bicycle linkages and end of trip facilities available on-site.						
D9-g	(g) include details regarding the methodology and monitoring/review program to measure the effectiveness of the objectives and mode share targets of the GTP, including the frequency of monitoring and the requirement for travel surveys to identify travel behaviours of staff to and from hospital.						
	Mechanical Ventilation						
D10	D10. Following completion, installation and testing of all mechanical ventilation systems, the Applicant must provide evidence to the satisfaction of the Certifying Authority, prior to the final occupation, that the installation and performance of the mechanical systems complies with:	CPB Contractors	Prior to Occupation	Collate all compliance documentation and issue to Certifier			
D10-a	(a) the BCA;						
D10-b	(b) *AS 1668.2-2012 The use of air-conditioning in buildings – Mechanical ventilation in buildings* and other relevant codes;						
D10-c	(c) the development consent and any relevant modifications; and						
D10-d	(d) any dispensation granted by the NSW Fire Brigade.						
	Car Parking Arrangements						
D11	D11. Unless otherwise agreed by the Planning Secretary, occupation or commencement of use of the building must not occur until evidence to the satisfaction of the Planning Secretary is submitted demonstrating that a minimum of 2,009 car parking spaces are available to staff and visitors on the site.	CPB Contractors	Prior to Occupation	Statement to be provided by Certifying Authority with receipt of supporting documentation to address this consent			
D12	D12. Prior to the occupation of the building, a car parking wayfinding strategy must be submitted to the Certifying Authority which details proposed measures, such as the installation of signage, to advise of, and direct drivers to, the various car parking facilities available across the site						
	Road Damage						
D13	D13. The cost of repairing any damage caused to Council or other Public Authority's assets in the vicinity of the Subject Site as a result of construction works associated with the approved development is to be met in full by the Applicant prior to commencement of use of any stage of the development.	Note	Note	NA	NA	NA	NA
	Fire Safety Certification						
D14	D14. Prior to the final occupation, a Fire Safety Certificate must be obtained for all the Essential Fire or Other Safety Measures forming part of this consent. A copy of the Fire Safety Certificate must be submitted to the relevant authority and Council. The Fire Safety Certificate must be prominently displayed in the building.	CPB Contractors	Prior to Occupation	Collate all compliance documentation and issue to Certifier/relevant authority			
	Structural Inspection Certificate						
D15	D15. A Structural Inspection Certificate or a Compliance Certificate must be submitted to the satisfaction of the Certifying Authority prior to the occupation of the relevant parts of any new or refurbished buildings. A copy of the Certificate with an electronic set of final drawings (contact approval authority for specific electronic format) must be submitted to the approval authority and the Council after:	CPB Contractors	Prior to Occupation	Collate all compliance documentation and issue to Certifier			
D15-a	(a) the site has been periodically inspected and the Certifying Authority is satisfied that the structural works is deemed to comply with the final design drawings; and						
D15-b	(b) the drawings listed on the Inspection Certificate have been checked with those listed on the final Design Certificate/s.						
	Compliance with Food Code						
D16	D16. Where relevant, the Applicant is to obtain a certificate from a suitably qualified tradesperson, certifying that the kitchen, food storage and food preparation areas have been fitted in accordance with the AS 4674 Design, construction and fit-out of food premises. The Applicant must provide evidence of receipt of the certificate to the satisfaction of the Certifying Authority prior to occupation.	CPB Contractors	Prior to Occupation (If Applicable)	Collate all compliance documentation and issue to Certifier			
	Stormwater Quality Management Plan						
D17	D17. Prior to occupation of the building, an Operation and Maintenance Plan (OMP) is to be prepared to ensure proposed stormwater quality measures remain effective. The OMP must contain the following:	CPB Contractors	Prior to Occupation	Prepare Operation & Maintenance Plan			
D17-a	(a) maintenance schedule of all stormwater quality treatment devices;						
D17-b	(b) record and reporting details;						
D17-c	(c) relevant contact information; and						
D17-d	(d) Work Health and Safety requirements.						
D18	D18. Details demonstrating compliance must be submitted to the Certifying Authority prior to occupation.						
	Rainwater Harvesting						
D19	D19. A signed works-as-executed Rainwater Re-use Plan must be provided to the Certifying Authority prior to occupation of the building.	CPB Contractors	Prior to Occupation	Develop Rainwater Re-use Plan			
	Warm Water Systems and Cooling Systems						
D20	D20. The installation, operation and maintenance of warm water systems and water cooling systems (as defined under the Public Health Act 2010) must comply with the Public Health Act 2010, Public Health Regulation 2012 and Parts 1 and 2 (or Part 3 if a Performance-based water cooling system) of AS/NZS 3666.2:2011 Air handling and water systems of buildings – Microbial control – Operation and maintenance and the NSW Health Code of Practice for the Control of Legionnaires' Disease.	CPB Contractors	Prior to Occupation	Ensure consultants understands the requirements of the SSDA			
D21	D21. To ensure that lighting of the building is sympathetic to the suburban environment and does not emphasise the scale of the building, the Applicant must prepare a lighting strategy for the proposed building in consultation with Council. The strategy shall be submitted to the satisfaction of the Certifying Authority prior to the occupation of the building and a copy provided to the Department and Council.	CPB Contractors	Prior to Occupation	Ensure consultants understands the requirements of the SSDA			
D22	D22. The Applicant must ensure the installed lighting associated with the development achieves the objective of minimising light spillage to any adjoining or adjacent sensitive receivers. Outdoor lighting must:						
D22-a	(a) comply with the latest version of AS 4282-1997 - *Control of the obtrusive effects of outdoor lighting* (Standards Australia, 1997); and						
D22-b	(b) be mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.						
D23	D23. The Applicant shall ensure that the installed lighting associated with the development achieves the objective of not causing distraction to helicopter operations associated with the proposed helipad having regard to the advice of a suitably qualified and experienced aviation professional and relevant National and International guidelines.						
	Signage						
D24	D24. Upon installation of outdoor lighting, but before it is finally commissioned, the Applicant must submit to the Certifier evidence from a qualified practitioner demonstrating compliance in accordance with conditions D21and D22.	CPB Contractors	Prior to Occupation	Applicable plans to be updated with relevant requirements			
D25	D25. Way-finding signage and signage identifying the location of staff car parking must be installed prior to occupation.						
D26	D26. Bicycle way-finding signage must be installed within the site to direct cyclists from footpaths to designated bicycle parking areas prior to occupation						
D27	D27. 'Do not drink' signage on non-potable water used for toilet flushing and to new hose taps and irrigation systems for landscaped areas must be installed within the site prior to occupation.						
D28	D28. Prior to occupation, installation of flood warning signs on the north-eastern corner of the site to prevent access from Great Western Highway during major flood events.						

	Operational Waste Management Plan						
D29	D29. Prior to the commencement of operation, the Applicant must prepare a Waste Management Plan for the development and submit it to the Department/Certifying Authority. The Waste Management Plan must:	CPB Contractors	Prior to Occupation	Applicable plans to be updated with relevant requirements			
D29-a	(a) detail the type and quantity of waste to be generated during operation of the development;						
D29-b	(b) describe the handling, storage and disposal of all waste streams generated on site, consistent with the *Protection of the Environment Operations Act 1997, Protection of the Environment Operations (Waste) Regulation 2014* and the *Waste Classification Guideline* (Department of Environment, Climate Change and Water, 2009);						
D29-c	(c) detail the materials to be reused or recycled, either on or off site; and						
D29-d	(d) include the Management and Mitigation Measures included in Section 11 of the EIS.						
	Validation Report						
D30	D30. The Applicant must prepare a Validation Report for the development. The Validation Report must:	CPB Contractors	Prior to Occupation	Statement to be provided by Certifying Authority with receipt of supporting documentation to address this consent			
D30-a	(a) be prepared by an appropriately qualified environmental consultant and reviewed by an EPA accredited Site Auditor;						
D30-b	(b) be submitted to EPA, the Planning Secretary and the Certifying Authority for information one month after the completion of remediation works;						
D30-c	(c) be prepared in accordance with the RAP and the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011);						
D30-d	(d) include, but not be limited to:						
D30-d(i)	(i) comment on the extent and nature of the remediation undertaken;						
D30-d(ii)	(ii) describe the location, nature and extent of any remaining contamination on site;						
D30-d(iii)	(iii) sampling and analysis plan and sampling methodology;						
D30-d(iv)	(iv) results of sampling of treated material, compared with the treatment criteria;						
D30-d(v)	(v) details of the volume of treated material emplaced within the containment cell and its location;						
D30-d(vi)	(vi) results of any validation sampling, compared to relevant guidelines/criteria;						
D30-d(vii)	(vii) discussion of the suitability the remediated areas for the intended land use; and						
D30-d(viii)	(viii) any other requirement relevant to the project.						
	Site Audit Report and Site Audit Statement						
D31	D31. Prior to occupation of the building, the Applicant must obtain from an EPA accredited Site Auditor, a Site Audit Statement and a Site Audit Report which demonstrates that the site is suitable for its intended use(s).	CPB Contractors	Prior to Occupation	Site Audit Statement & Audit Report			
D32	D32. Within 3 months of submission of the Validation Report required by condition D30, the Applicant must demonstrate to the satisfaction of the Certifying Authority that the Site Auditor has submitted a Site Audit Report and Site Audit Statement to EPA in accordance with the requirements of EPA's Guidelines for the NSW Site Auditor Scheme (3rd Edition) 2017.	CPB Contractors	Prior to Occupation	Statement to be provided by Certifying Authority with receipt of supporting documentation to address this consent			
	Landscaping						
D33	D33. Prior to occupation of the building, the Applicant must prepare a Landscape Management Plan to manage the revegetation and landscaping works on-site, to the satisfaction of the Certifying Authority. The plan must:	CPB Contractors	Prior to Occupation	Ensure consultants understands the requirements of the SSDA			
D33-a	(a) detail the species to be planted on-site;						
D33-b	(b) describe the monitoring and maintenance measures to manage revegetation and landscaping works;						
D33-c	(c) be consistent with the Applicant's Management and Mitigation Measures at EIS;						
D33-d	(d) provide for the planting of 222 trees as per the Landscape Plans and Plant Schedule prepared by Arcadia Landscape Architecture dated 21/08/2018.						
D34	D34. The Applicant must not commence operation until the Landscape Management Plan is submitted to the Certifying Authority.	CPB Contractors	Prior to Occupation	Collate all compliance documentation and issue to Certifier			
	Ecologically Sustainable Development						
D35	D35. Within 6 months of commencement of operation, Green Star certification must be obtained demonstrating the development achieves a minimum 4 star Green Star As Built rating unless updated NSW Health Engineering Guidelines are accepted by the Planning Secretary. Evidence of the certification or other evidence as agreed with the Planning Secretary in updated NSW Health Engineering Services Guidelines must be provided to the Certifying Authority and the Planning Secretary.	CPB Contractors	Prior to Occupation	Statement to be provided by Certifying Authority with receipt of supporting documentation to address this consent			
	Easements						
D36	D36. A drainage easement is to be dedicated over the existing drainage infrastructure that drains Barber Avenue through the hospital grounds to Somerset Street. The drainage easement widths are to be in accordance with Council's Stormwater Drainage Specification for Building Developments.	CPB Contractors	Prior to occupation	Survey drainage easement			
	Hospital shuttle bus						
D37	D37. A report with revised shuttle bus schedule, including pick up and drop off points is to be provided to the Certifying Authority and the Planning Secretary. This report should demonstrate compliance with disability access requirement at the pick-up and drop-off points, timing and integration with public transport services and provide waiting areas that have weather protection.	Health Infrastructure	Prior to Occupation	Statement to be provided by Certifying Authority with receipt of supporting documentation to address this consent			
	Wind Tunnel Testing						
D38	D38. Prior to the occupation of the building, details of compliance with the recommendations within the Pedestrian wind Environment Statement prepared by Windtech dated 6/04/2018 is to be submitted to the Certifying Authority.	CPB Contractors	Prior to Occupation	Statement to be provided by Certifying Authority with receipt of supporting documentation to address this consent			
	PART E - POST OCCUPATION						
	Operation of Plant and Equipment						
E1	E1. All plant and equipment used on site, or to monitor the performance of the development must be:	NBMLHD	Post Occupation	Maintenance / Operational Checklists			
E1-a	(a) maintained in a proper and efficient condition; and						
E1-b	(b) operated in a proper and efficient manner.						
	Community Communication Strategy						
E2	E2. The Community Communication Strategy, as approved by the Planning Secretary, must be implemented for a minimum of 12 months following the completion of construction.	NBMLHD	Post Occupation	Community Communication Report			
	Operational Noise Limits						
E3	E3. The Applicant must ensure that noise generated by operation of the development does not exceed the noise limits in Acoustic Assessment Report (Rev) prepared by Acoustic Logic and dated 15/11/2018.	NBMLHD	Post Occupation	Post Occupation noise data monitoring			
E4	E4. The Applicant must undertake short term noise monitoring in accordance with the Noise Policy for Industry where valid data is collected following the commencement of use of each stage of the development. The monitoring program must be carried out by an appropriately qualified person and a monitoring report must be submitted to the Planning Secretary within two months of commencement use of each stage of the development to verify that operational noise levels do not exceed the recommended noise levels for mechanical plant identified in Acoustic Assessment Report (Rev) prepared by Acoustic Logic and dated 15/11/2018. Should the noise monitoring program identify any exceedance of the recommended noise levels referred to above, the Applicant is required to implement appropriate noise attenuation measures so that operational noise levels do not exceed the recommended noise levels or provide attenuation measures at the affected noise sensitive receivers.						
	Unobstructed Driveways and Parking Areas						
E5	E5. All driveways, footways and parking areas must be unobstructed at all times. Driveways, footways and car spaces must not be used for the manufacture, storage or display of goods, materials, refuse, skips or any other equipment and must be used solely for vehicular and/or pedestrian access and for the parking of vehicles associated with the use of the premises.	NBMLHD	Post Occupation				
	Green Travel Plan						
E6	E6. The Green Travel Plan required by condition D9 of this consent must be updated annually and implemented.	NBMLHD	Post Occupation	Green Travel Plan			
	Outdoor Lighting						
E7	E7. Notwithstanding Condition D21, should outdoor lighting result in any residual impacts on the amenity of surrounding sensitive receivers, the Applicant must provide mitigation measures in consultation with affected landowners to reduce the impacts to an acceptable level.	NBMLHD	Post Occupation	Maintenance / Operational Checklists			
	Fire Safety Certificate						
E8	E8. The owner must submit to Council an Annual Fire Safety Statement, each 12 months after the final Safety Certificate is issued. The certificate must be on, or to the effect of, Council's Fire Safety Statement.	NBMLHD	Post Occupation	Annual Fire Safety Checklist			
	Landscaping						
E9	E9. The Applicant must maintain the landscaping and vegetation on the site in accordance with the approved Landscape Management Plan required by condition D33 for the duration of occupation of the development.	NBMLHD	Post Occupation	Maintenance / Operational Checklists			

	Hazard Audit						
E10	E10. Within twelve months after the commencement of operation and every three years thereafter, or at such intervals as the Planning Secretary may agree, the Applicant must carry out a comprehensive Hazard Audit of the development. Division 9.4 of Part 9 of the EP&A Act applies to these audits, which are for the purpose of hospital. The audits must:	NBMLHD	Post Occupation	Hazard Audit Reports			
E10-a	(a) be carried out at the Applicant's expense by a qualified person or team, who have been approved by the Planning Secretary and are independent of the development;						
E10-b	(b) be carried out in accordance with the Department's *Hazardous Industry Planning Advisory Paper No. 5, 'Hazard Audit Guidelines'*; and						
E10-c	(c) include a review of the site Safety Management System and a review of all entries made in the incident register since the previous audit.						
E11	E11. Within one month of completing each audit carried out in accordance with condition C43, the Applicant must submit a report to the satisfaction of the Planning Secretary for information. The audit report must be accompanied by a program for the implementation of all recommendations made in the audit report. If the Applicant intends to defer the implementation of a recommendation, reasons must be documented.						
	Hazards and Risk						
E12	E12. The Applicant must store all chemicals, fuels and oils used on-site in accordance with:	NBMLHD	Post Occupation	Hazardous Material Register			
E12-a	(a) the requirements of all relevant Australian Standards; and						
E12-b	(b) the NSW EPA's *Storing and Handling of Liquids: Environmental Protection – Participants Manual*' if the chemicals are liquids.						
E13	E13. In the event of an inconsistency between the requirements of condition E12(a), the most stringent requirement must prevail to the extent of the inconsistency..						
	Dangerous Goods						
E14	E14. The quantities of dangerous goods stored and handled at the site must be below the threshold quantities listed in the Department of Planning's Hazardous and Offensive Development Application Guidelines – Applying SEPP 33 at all times.	NBMLHD	Post Occupation	Hazardous Material Register			
	Discharge Limits						
E15	E15. The development must comply with section 120 of the POEO Act, which prohibits the pollution of waters, except as expressly provided for in an EPL.	NBMLHD	Post Occupation	Maintenance / Operational Checklists			
	Bunding						
E16	E16. The Applicant must store all chemicals, fuels and oils used on-site in appropriately bunded areas in accordance with the requirements of all relevant Australian Standards, and/or EPA's Storing and Handling of Liquids: Environmental Protection – Participants Manual (Department of Environment and Climate Change, 2007).	NBMLHD	Post Occupation	Hazardous Material Register			

Appendix 2 - Compliance Report Declaration Form Template

Independent Audit Declaration Form
Project Name
Consent Number
Description of Project
Project Address
Proponent
Title of Audit
Date

I declare that I have undertaken the Independent Audit and prepared the contents of the attached Independent Audit Report and to the best of my knowledge:

- the audit has been undertaken in accordance with relevant condition(s) of consent and the *Independent Audit Post Approval Requirements (Department 2018)*;
- the findings of the audit are reported truthfully, accurately and completely;
- I have exercised due diligence and professional judgement in conducting the audit;
- I have acted professionally, objectively and in an unbiased manner;
- I am not related to any proponent, owner or operator of the project neither as an employer, business partner, employee, or by sharing a common employer, having a contractual arrangement outside the audit, or by relationship as spouse, partner, sibling, parent, or child;
- I do not have any pecuniary interest in the audited project, including where there is a reasonable likelihood or expectation of financial gain or loss to me or spouse, partner, sibling, parent, or child;
- neither I nor my employer have provided consultancy services for the audited project that were subject to this audit except as otherwise declared to the Department prior to the audit; and
- I have not accepted, nor intend to accept any inducement, commission, gift or any other benefit (apart from payment for auditing services) from any proponent, owner or operator of the project, their employees or any interested party. I have not knowingly allowed, nor intend to allow my colleagues to do so.

Notes:

a) Under section 10.6 of the *Environmental Planning and Assessment Act 1979* a person must not include false or misleading information (or provide information for inclusion in) in a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is false or misleading in a material respect. The proponent of an approved project must not fail to include information in (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is materially relevant to the monitoring or audit. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000; and

b) The *Crimes Act 1900* contains other offences relating to false and misleading information: section 307B (giving false or misleading information – maximum penalty 2 years imprisonment or 200 penalty units, or both)

Name of Auditor
Signature
Qualification
Company
Company Address