APPENDIX A: ENVIRONMENTAL AND SUSTAINABILITY STRATEGIC FRAMEWORK

APPENDIX B: ENVIRONMENTAL AND SUSTAINABILITY POLICY

HINDMARSH
Leadership at work

Environment and Sustainability Policy

Hindmarsh operates with full appreciation and awareness that environmental protection and sustainability are principle to our ongoing success. Operations in terms of both construction and completion are compassionate to the environment, the local community and aim to support the ongoing sustainability of the environment.

Hindmarsh seeks to meet its own environmental needs and the needs and expectations of clients, stakeholders, employees and the community by:

- Setting and continually reviewing measureable environmental objectives and targets. Backed by ongoing monitoring, reporting and analysis supporting continual improvement. Complimented by ongoing feedback at all levels.
- Prevent pollution and unnecessary resource consumption by setting targets and maintaining systems and processes which facilitate the more efficient use of energy and material resources and improved waste management, waste avoidance, re-use and recycling.
- Seek to minimise construction related aspects and impacts including noise, vibration, groundwater, air quality, land contamination, amenity and heritage.
- Promote a shared sense of ownership and responsibility for optimal environmental performance from board through to employees and contractors whilst developing a culture of environmental respect and appreciation.
- Encourage and support environmental awareness through ongoing training and development of competencies particular to specific environmental impacts related to individual activities.
- Comply with all legal requirements including environmental Legislation, Regulations, Codes of Practice, Applicable Australian and other standards specific to Hindmarsh.
- Implement and maintain the Hindmarsh Management System and its Environmental elements to ensure all potential aspects and impacts are identified, evaluated and suitably eliminated or controlled.
- Foster and support continuous improvement at all levels including the identification of key environmental initiatives.

Compliance with this policy will be monitored, audited and continually reviewed so as to remain effective and aligned with all of our operations.

Rowan Hindmarsh
Chief Executive Officer

APPENDIX C:
ROLES AND RESPONSIBILITY MATRIX

HINDMARSH
Leadership at work

Project Roles and Responsibility Matrix

L = Leadership (Accountable)
P = Participate in / Complete Task (Responsible)
C = Communicated to
M = Mandatory

Project Name : 17 Roberts Road, Eastern Creek, Data Centre
Project Revision Number : 1 Date **17-Sep-20**

Task	Company Positions			Standard Project Positions \ Roles					
	- State Manager	- Construction Manager	- State SQE Manager	- Project Manager (PM)	- Site Manager (SM)	- Contract Administrator (CA)	- Project Coordinator / Site Supervisor	- Construction Worker 1	- Construction Worker 2
	Reports to GMC	Reports to MCO	Reports to MCO	Reports to MCO & PD	Reports to PM	Reports to PM	Reports to PM	Reports to SM	Reports to SM
Initials of Person Holding Position									
Project General									
Point of Contact for Client Representative	P	P		L		P			
Point of Contact for Consultants		P		L	P	P	P		
Point of Contact for Industrial Relations	P	P	P	L	P				
Manage and Track Right of Entry Notices				P	P		L		
Manage and Track Code of Practice, Legislative Requirements			P	L	P	P			
Planning									
Appoint Project Team & maintain resourcing	L	P		P					
Lead and mentor the team	P	P		L	P				
Manage / Roster Staff				L	P	P			
Establish / Maintain Roles and Responsibilities Matrix and Induct team to it's use				L			P		
Employee performance appraisals as per Company Schedule		P		L					
Identify, Coordinate & Implement Training Requirements			P	P	L		P		
Review Head Contract	P	P		P		L			
Understand and keep abreast of Terms & Conditions	P	P		L		P			
Define the Contractual Project Scope	P	P		L		P	P		
Identify Contractual Risks	P	P		L		P			
Develop and update Contract Procedures / Processes				L		P			
Store Contract document - client						P			
Building Works Approvals				L	P	P			
Establish project budget	P	P		L		P			
Establish Cheops code allocation				P		L			
Payment of Subcontractors and Suppliers				P		L			
Identify / Design or Service Scope				L		P			
Consultant - contractor Selection / Shortlist				L		P			
Develop Brief, Scope and Profile				L		P			
Consultant Agreement Schedules				L		P			
Consultant Agreement Recommendation				L		P			
Execute Consultant Agreement				L		P			
Monitoring of consultant performance				L		P	P		
Manage and undertake Dilapidation report				L	P				
Arrange and Maintain Facilities / toilets/tables/chairs					L				
Arrange and Maintain Equipment /locks/security/					L				
Arrange and Maintain Services / electrical/plumbing					L				
Arrange and Maintain IT requirements				L		P			
Prepare, monitor and update - files, drawings, ACONEX				P		P	P		
Establish & Maintain Amenity Cleaning & Supply					L			P	P
Identify, provide and maintain special storage requirements (inc Haz Substance)					L				
Establish & Maintain Perimeter Fencing					L			P	P
Establish & Maintain Entry					L				
Establish & Maintain Environmental conditions					L			P	P
Establish & Maintain Safety Information /posters/hazard reporting/signage					L				
Establish & Maintain Company Branding				L	P	P			
Arrange and Maintain Stationary & Miscellaneous Supplies				P		L			
Prepare, monitor and update Project Management Plan				L	P		P		
Prepare, monitor and update Project Commencement Checklist				L	P		P		
Prepare, monitor and update Performance Targets				L	P	P	P		
Prepare, monitor and update Stakeholder Risk Profile				L	P	P	P		
Prepare, monitor and update Project Risk Assessment				L	P	P	P		
Design									
Prepare, monitor and update Safety in Design Risk Profiles			P	L			P		
Participate in design and pre-construction planning		P		L	P		P		
Conducting workshops with customers/clients at the conceptual design stage				L		P			
Liaise with Architects, Engineers etc regarding specifications technical matters.				L	P		P		
Vet contract documentation in relation to design services and construction aspects.				L	P		P		
Identify interface, coordination and procurement issues relating to design				L	P	P			
Prepare schedules to ensure the timely completion of design services for projects.				L	P	P	P		

Doc No: C-PRE-F026 Rev. No: 02 Page No 1 of 5

Task	- State Manager	- Construction Manager	- State SQE Manager	- Project Manager (PM)	- Site Manager (SM)	- Contract Administrator (CA)	- Project Coordinator / Site Supervisor	- Construction Worker 1	- Construction Worker 2
Liaise with design team, client, sub-contractors and suppliers				L	P	P	P		
Field testing or trialling proto-types with a representative group of users				L	P	P	P		
Design for safe maintenance			P	L	P				
Design for safe alteration			P	L	P	P			
Test, trial or evaluate the design solution with various users (WHERE PERMITTED).				L		P			
Prepare, monitor and update ITPs, product inspections, sampling register				P	P	P	L		
Implement design procedure \ management plan				L	P	P	P		
Undertake and design safety reviews for constructability, operability and maintenance				L	P	P	P		
ESD Reviews				L	P	P	P		
Procurement									
Prepare Procurement Schedule				P	P	P	L		
Monitor and Update procurement schedule				P		P	L		
Identify on procurement schedule long lead time plant/materials				L	P	P			
Prepare scope of work & documentation list		P		P	P	L	P		
Internal Fitout						L			
Services/Structure							L		
External/Facades									
Identify any discrepancies, anomalies associated with documents		P		L	P		P		
Develop detailed scope of works (in conjunction with proforma)				P		L	P		
Undertake formal OHS & E review of tenders				P	L				
Services Manager to be involved in Final review of of services let, Pre-award				L		P	P		
Review tenders and quotation to determine conformity with the tender				P		L	P		
Internal Fitout						L			
Services/Structure							L		
External/Facades									
Draft a recommendation to engage the contractor	P	P		P		L	P		
Issue Recommendation per Internal Approval	P	P		L		P	P		
Internal Fitout						L			
Services/Structure							L		
External/Facades									
Issue Subcontract Agreement (No letters of Intent)				P		L	P		
Delivery									
Site Supervision & Coordination									
Structural trades				P	L				
Services				P	P	P	L		
Finishes trades				P	P				
External Works: Hebel/Windows/External Balustrade/Waterproofing/Public Realm				P	P				
Coordinators									
Structural trades				P	P		L		
Services Trades				P	P		L		
Finishes trades				P	P				
External Works: Hebel/Windows/External Balustrade/Waterproofing/Public Realm				P	P				
Site Progressive Clean up and Waste Removal / Control					L			P	P
Materials Handling & Delivery coordination					L			P	P
Record of plant hire and note of off-hire number					L			P	P
Coordinate Subcontractor Resources				P	L		P		
Take Weekly Photos, date and electronically file					P		P		
Prepare, monitor and update sub-contract register				P		L	P		
Draft Subcontracts for approval and sign off				P		L			
Approve and sign off Subcontracts	P	P		P		L			
Approval of Subcontractor / Supplier claims				P		L			
Payment of Subcontractors and Suppliers				P		L			
Ensure adequate retention held prior to final claims (incl defects / NCR's)				P		L			
Preparation of Client Progress Claim and follow up payment of				P		L			
Ensure subcontractor submit of statutory doc's (insurance, workcover, licences etc)				P		L			
Manage BG's / retentions at project completion				P		L			
Log purchase orders				P	P	L			
Establish a register and monitor site IT Recoverables				P		L			
Establish a register and monitor project reimbursables				P		L			
Collate monthly timesheets for PM signature				P	P	L			
Collate Weekly timesheets for approval				P	L	P		P	P
Control of incoming & outgoing fax						P	L		
Prepare Letting Schedule; nominate responsible party for each trade				L		L	P		
Prepare & Update Variation Register				P		L			
Prepare / Issue Variation Quotations				P	P	L			
Issue Variation Notices to subcontractors				P	P	L	P		
Manage timely approval of variations				P		L			
Enter Variations into cheops. (confirm Process)						L			
Enter Budgets into cheops				P		L			
Prepare Back charge Register				P		L			
Issue Back charge notices to Subcontractors				P		L			
Respond to Subcontractor Claims - EOT				P		L			
Maintain an accurate site diary					L				
Prepare and Issue Monthly Client Reports				L		P			
Prepare and Issue Monthly SQE Reports				P	L				

Task	- State Manager	- Construction Manager	- State SQE Manager	- Project Manager (PM)	- Site Manager (SM)	- Contract Administrator (CA)	- Project Coordinator / Site Supervisor	- Construction Worker 1	- Construction Worker 2
Prepare, monitor, update and Financial Calendar				P		L			
Prepare, monitor, update and Security Bonds				P		L			
Prepare and Issue Monthly Cheops Reporting				P		L			
Prepare, monitor, update and Progress Claims				P		L			
Prepare, monitor, update and Issue Cash Flow				P		L	P		
Prepare, monitor and update Risk and Opportunity Register (Project \ Stakeholder)				L	P	P			
Prepare / Update Contingency report				P		L			
Prepare Monthly Cost Report as per established format (ongoing through month with regularly input)				L		P			
Prepare, monitor and update Weekly Programs				P	L		P		
Prepare, monitor and update 4 weekly programs				P	L		P		
Track activities on programme ; Master Programme to be visible on Wall				L	P		P		
Prepare, monitor, update and display Staging Plan (Site or Office wall).				P	L				
Subcontractor programmes to be developed				L	P		P		
Prepare, monitor and update Commissioning Programme				P	P		L		
Prepare, monitor and update Master Program (electronic)				L	P		P		
Collate and Issue Fortnightly Programs to subcontractors.				L	P				
Issue Updated Master program to Subcontractors / Client				L	P		P		
Track critical path activities				P	L		P		
Prepare, monitor and update EOT / Delay Register				P	P	P			
Substantiate EOT / Delay Claims				P	P	P			
Prepare schedules to ensure the timely completion of design services for projects.				L	P	P			
Meeting Schedule to be developed and issued to all parties				L					
Project Control Group Meeting	P	P		L					
Client / Consultant Meeting				L	P		P		
Subcontractor Meetings				P	L		P		
Design Meetings (Hindmarsh lead meetings or involvement)				L	P		P		
Internal Programming / Production Meeting - Construction program				L	P				
Site Safety Committee Meeting				P	L		P		
Staff/ Team Meeting		P		L	P	P	P	P	P
Site pre start meeting (Compulsory)				P	L		P		
Group/work team OH&S discussions				L	P	P	P	P	P
Liaise with Local Authorities / Emergency / Electrical / Water/				P	L		P		
Safety									
Safety Management Plan Requirements									
Prepare, monitor and update Safety Management Plan			P	L	P	P	P		
Prepare, monitor and update Project Risk Assessment			P	P	L	P	P		
Ensure each Management Plan reflects and supports the current Project and Teams Needs			P	L	P	P	P		
Completion of reports in support of Objectives and Targets (Onsite data entry)			P	P	L	P	P		
Ensure the Project team are aware and understand Company Objectives and Targets			P	L	P	P	P	P	P
Identification of any client / contractual Project Objectives and Targets			P	L	P				
Accountable for all Safety matters across the state	L		P	P					
Ensure the Project SMP is complied with (entire team)	P	P	P	L	P	P	P	P	P
Identify Legislative and Regulatory requirements relevant to Project operations.			P	P	L				
Review Legislative and Regulatory requirements relevant to Project operations.			P	P	L				
Ensure all relevant contractor documentation is forwarded for work permit approval per Project Risk Assessment				P	L		P		
Review and ensure all Safe Work Method Statements reflect Risks identified and appropriate controls, ensure relevant legislation / regulations are acknowledged			P	P	L				
Ensure any training completed at project level is documented and relevant forms completed and forwarded to HR				L	P	P	P	P	P
Identification of any skill gaps at project level, arrangement of training ID and ensuring training is completed				L	P	P	P	P	P
Conduct Site Specific Inductions					L				
Maintenance of all Induction (including Visitor) Records and Registers					L				
Ensure all workers performing work on site complete site induction				P	L				
Conduct Visitor Inductions					L				
Seek and review Plant Risk Assessments (Hindmarsh or subcontractor assessments)					L				
Complete Weekly SQE Report				P	L				
Ensure registers for plant, electrical, equipment, maintenance associated with Hindmarsh equipment are current.					L				
Maintain the Hindmarsh Plant Register and associated Plant Risk Assessments and Service / Check logs					L				
Perform periodic spot checks on contractors to ensure Plant and Equipment records, including risk assessments, are current and adequate					L				
Review Safety Management Plan and associated documents / sub plans / risk profiles			P	L	P				
Identification and management of any Health Surveillance Requirements			P	L	P				
Completion of Federal Safety Reports			P	L					
Completion of Monthly Internal Project Report			P	L	P	P	P	P	P
Reporting of Incidents (entire team)	P	P	P	L					
Completion of Incident Reports			P	L	P	P	P	P	P
Action Incident Investigation			P	L	P				
Ensure Regulatory Notification where required in the event of notifiable Incident			P	L	P				
Other Safety Requirements									
Prepare, monitor and update Emergency Management Plan			P	L	P				
Review and update Hazardous Substance Register & MSDS & Risks Assessments				P	L				
Manage and monitor to site and subcontractor OHSE Requirements				P	L				
Evaluate OH&S performance of subcontractors				P	L	P	P		
Attend Sub contractor tool box meetings randomly					L				
Initiate and coordinate OH&S awareness activities or presentations			P	L	P				
Consult on and resolve OH&S issues			P	L	P				
Administer first aid to injured persons					L				
Assist with return to work and rehabilitation processes			L	P	P				

Task	- State Manager	- Construction Manager	- State SQE Manager	- Project Manager (PM)	- Site Manager (SM)	- Contract Administrator (CA)	- Project Coordinator / Site Supervisor	- Construction Worker 1	- Construction Worker 2
Emergency Management									
Prepare, monitor and update Project Emergency Management Plan			P	L	P	P			
Nominate Chief Emergency Warden CEW (confirming competency)				L	P		P		
Nominate First Aiders (ensure adequate number of personnel per workers)				L	P				
Ensure Dangerous / Hazardous goods or substances are stored as per MSDS				P	L				
Ensure MSDS records are maintained and available				P	L				
Ensure Hazard / Substance Register is up to date				P	L				
Document any client / contractual emergency requirements within the EMMP				L	P				
Display Rehabilitation / Employee Assistance Flow Chart in Site Sheds				P	L				
Display Incident Reporting Flow Charts in Site Sheds				P	L				
Ensure statutory reporting requirements are understood and documented within the EMMP				L	P				
Record First Aid, Medical, Lost Time Injury Treatments - Via Monthly SQE Report				L	P				
Emergency Personnel will have training booked to meet requirements where required or where unforeseen training				L	P	P			
Emergency and First Aid Equipment will be determined and placed as per CEW assessment				L	P				
Display EMMP Appendices within site sheds				L	P				
Track and records number of workers on site				L	P				
Induct all workers into the EMMP and its requirements				L	P				
Discuss / invite / forward emergency plans to local authorities for input / feedback / approval				L	P				
Coordinate Emergency Drills				P	L				
Document Emergency Drills and Findings associated with Emergency Equipment Tests, Exit signage, paths of travel and				P	L				
Ensure all emergency documents / records are maintained as per the EMMP				P	L				
Traffic Management									
Prepare, monitor and update Project Traffic Management Plan				L	P				
Overall Accountability of TTMP including reporting to MCO & Client Representative				L	P				
Responsible for ensuring compliance with TTMP (all employees)	P	P	P	L	P	P	P	P	P
Inclusion of Traffic Management requirements in induction					L				
Ensure persons engaged in TTMP work are competent and adequately trained					L				
Identify and maintain TTMP Docs / Records as per project requirements					L				
Regularly monitors physical controls are maintained as per TTMP Drawing / Design					L				
Ensure performance of TTMP is reviewed, with suitable corrections where necessary					L				
Design of Temporary Road Layout / Signage and other requirements (maybe outsourced)					L				
Maintenance of TTMP Signs					L			P	P
Removal / Movement of TTMP Signage (maybe outsourced)					L				
Communication of changes in TTMP to relevant parties are effective and accurate					L				
Ensure all staff and subcontractors are aware of implementation & importance of TTMP					L				
Advise suppliers of TTMP requirements when supplier delivering to site					L				
Manage material handling & delivery requirements					L				
Quality Assurance									
Prepare, monitor and update Project Quality Plan				L	P	P	P		
Obtain, read and understand Quality Management Plan				L	P	P	P		
Document any QA related objectives and Targets				L	P	P	P		
Develop monitoring system for Project Quality Objectives and Targets				L	P	P	P		
Confirm QA Role and Resource allocation is adequate to support quality requirements				L	P	P			
Identify and Schedule any additional QA Training Requirements				L		P	P		
Identify and document any quality High Risks / Opportunities				L	P	P	P		
Confirm QA Document and Record Management Requirements				L	P	P	P		
Understand compliance requirements, auditing and inspections				L	P	P	L		
Determine Quality Reporting Requirements				L	P	P	L		
Provide a weekly summary status of RFI's / Shop drawings prior to project team meetings flagging critical items				L	P	P			
Develop and Document Communication Workflows				L		P			
Document Control									
Architectural							P		
Structural & Services							L		
Setup Aconex - user access, workflows, mail types, document management				P		P	L		
Establish Requestion for Information Workflow (aconex or flowchart)				P		P	P		
Issue Request For Information				P	P	P	P		
Establish Manage and Update Request for Information Register				P		P	P		
Consolidate RFI responses (& issue internally) including confirmation whether time or cost implication - Coordinated via				P	P	P	P		
Establish Engineer / Arch / Client Instruction workflow (aconex or flowchart)				P	P	P	P		
Establish Hindmarsh Site Instruction requirements / workflow (aconex or flowchart)				P	P	P	P		
Consolidate Instruction responses (& issue internally) including completion of Design Change Authority Form as				L	P	P	P		
Issue Site Instructions (SI)				P	P	L	P		
Establish Manage and Update Site Instruction Register				P		P	P		
Coordinate project documentation via Aconex (Drawings / Specifications)				P		P	P		
Mark (cloud) hard copy 'For Construction Drawings' with Site / Client Instructions or RFI				P	P	P	P		
Monitor shop drawings and ensure timely submission and approval				P	P	P	P		
Establish Prototype and Sample Register - Manage Submissions & approvals				P	P	P	P		
Action and or Close out Client / Consultants requests				P	P	P	P		
Action and or Close out Client / Hindmarsh Site Instructions				P	P	P	P		
Develop and document Project QA Strategy				L	P	P	P		
Determine and document Definable Features of Work				L	P	P	P		
Review Project Documentation (Specifications, drawings) and complete QAC Part 1				P	P	L	P		
Review Subcontractor QA Documentation using related QAC Part 2				P	P	P	L		
Develop and implement Hindmarsh ITPs as appropriate				P	P	P	L		
Develop and document Inspection (internal and external) processes				L	P	P	L		
Complete Notifications to Validating Consultants / Authorities				L	P	P			
Close out raised Inspection Actions				P	P	P	L		
Identify and Register Hindmarsh owned measuring equipment				P	P	P	L		

Task	- State Manager	- Construction Manager	- State SQE Manager	- Project Manager (PM)	- Site Manager (SM)	- Contract Administrator (CA)	- Project Coordinator / Site Supervisor	- Construction Worker 1	- Construction Worker 2
Obtain measure equipment register and calibration records from subcontractors					P		L		
Issue ARNs for Non-conforming product and services as required				P	P	P	P		
Issue ARNs for Corrective and Preventive Action requirements as required				P	P	P	P		
Monitor and ensure timely close out of ARNs				L	P	P	P		
Complete Design Change Authority Form for all scope changes				L		P	P		
Register and track to closure each Design Change Authority (Aconex or Design Change Register)				P	P	L	P		
Ensure Trade Procurement addresses QA requirements				L	P	P	L		
Complete inspection of goods received				P	L		P		
Seek completion of Client Satisfaction Survey (6 monthly)				L		P			
Continually review and update construction program				L	P	P	P		
Other QA Items									
Prepare, monitor and update commissioning Register				P		P	L		
Manage the technical compliance of services and commissioning data					P	P	L		
Review service documentation for compliance and errors / anomalies				P	P	P	L		
SA - Certification of Completion for Installation of Essential Safety Provisions Form 2 Development Act.				L		P	P		
Environment and Sustainability									
Prepare, monitor and update Project Environmental Plan			P	L	P				
Establish and document environmental objectives and targets			P	L	P				
Develop monitoring system for Project Env Objectives and Targets			P	P	L				
Confirm ENV Role and Resource allocation is adequate to support env requirements			P	L	P				
Identify and Schedule any additional ENV Training Requirements			P	L		P			
Review Legislative and Regulatory Register ensuring env requirements are identified			P	L	P				
Ensure understanding regarding legislative / regulatory access and monitoring			P	L	P	P	P		
Prepare, monitor and update Environmental Risk Profile			P	L	P				
Review and make project specific required Environmental Impact Guides			P	L	P				
Update and monitor Environmental Controls as nominated with Risk Profile and Environmental Impact Guides			P	P	L				
Understand incident reporting requirements and expectations			P	L	P	P			
Ensure Env Hazard Reporting requirements are understood and satisfactory to workers			P	P	L			P	P
Determine and document community / stakeholder communication requirements			P	L		P	P		
Determine and document env communication strategy			P	L		P	P		
Understand compliance requirements and expectations			P	L	P	P	P		
Inspect and monitor project specific env controls and processes. Document via Environmental and Sustainability Check			P	P	L	P	P	P	P
Issues ARNs where required to address Env requirements				P	L				
Determine and document env reporting requirements				P	P	P	L		
Confirm and Document env document and record Management Requirements				P	L		P		
Document available env reports				P	P		L		
Document Project information and particulars				P		L			
Determine and document subcontractor management processes				L	P	P			
Other Env Items									
Liase with community stakeholders as per environmental managment plan requiremnts			P	P	L				
Practical Completion									
Additional Client Requirements				L	P	P			
Prepare Powering up schedule					L	P	P		
Consolidate Defect Lists & Programme				P	P	P	P		
Action Defect Lists advise Subcontractors				P	P	P	P		
Generate & Close out internal defects lists				P	P	P	P		
Manage the submission of maintenance manuals				P		P	L		
Ensure works are completed in accordance with the documentation and AS Standards				L	P	P	P		
Formal handover to client				L	P	P			
Ensure adequate retention held prior to final claims (incl defects / NCR's)				P		L			
Client Satisfaction Survey				L	P	P			

LEGEND

L = Leadership / Complete Task (Accountable)

P = Participate in

M = Mandatory

Direct responsibility to complete the activity drawing on the advice & assistance provided by Provide technical and proactive assistance (physically help) to allow the person responsible to Company Mandatory Roles & Responsibility Requirement and cannot be deleted and may need

Highlights the respective Task is not applicable to the Project

Highlights Position is yet to be resourced

Highlights task is not a Hindmarsh Responsibility / Task may be complete by client / other

Signed Agreement - as tracked via Aconex

- State Manager
- Construction Manager (CM)
- Project Manager (PM)
- Site Manager (SM)
- Site Supervisor/QA
- Contracts Administrator (CA)
- State SQE Manager (SSM)
- Project Safety Advisor (PSA)
- Construction Worker (CW)
- Construction Worker (CW)

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Doc No: C-PRE-F026 Rev. No: 02 Page No 5 of 5

APPENDIX D: LEGAL REQUIREMENTS

HINDMARSH
Leadership at work

LEGAL REGISTER
SAFETY - Acts, Regulations, Codes, Guides

NEW SOUTH WALES

Law and Code Title	Type	In force	Date Current	Status	Category	Sub- Category	Comments
Aboriginal Land Rights Act 1983	Act	1983	2018	Current	Environmental	heritage	
Abrasive blasting	Code of Practice	2012	2014	Current	Safety	Abrasive Blasting	
Amenity Tree Industry: Code of Practice	Code of Practice	1998	1998	Current	Safety	Tree Lopping	
Annual Holidays Act 1944	Act	1944	2016	Current	Employment	Employment	
Anti-Discrimination Act 1977	Act	1977	2018	Current	Employment	Employment	
ANZEC Guideline for Blasting	Guide	1990	1990	Current	Environmental	Blasting	
Apprenticeship and Traineeship Act 2001	Act	2001	2018	Current	Employment	Employment	
Border Railways Act 1922	Act	1922	2007	Current	Rail	Rail	
Building and Construction Industry Long Service Payments Act 1986	Act	1986	2018	Current	Employment	Employment	
Building and Construction Industry Security of Payment Act 1999	Act	1999	2017	Current	Commercial	Commercial	
Building and Construction Industry Security of Payment Regulation 2008	Regulation	2008	2018	Current	Commercial	Commercial	
Building Professionals Act 2005	Act	2005	2018	Current	Building	Building	
Building Professionals Regulation 2007	Regulation	2007	2019	Current	Building	Building	
City of Sydney Act 1988	Act	1988	2018	Current	Local Government	Local Government	
Civil Liability Act 2002	Act	2002	2019	Current	Civil law	Civil law	
Civil Liability Regulation 2019	Regulation	2019	2019	Current	Civil law	Civil law	
Coastal Management Act 2016	Act	2016	2018	Current	Environmental	Coast	
Commercial Arbitration Act 2010	Act	2010	2018	Current	Civil law	Civil law	
Confined Spaces	Code of Practice	2012	2016	Current	Safety	Confined Spaces	
Construction work	Code of Practice	2012	2014	Current	Safety	Construction	
Contaminated Land Management Act 1997	Act	1997	2019	Current	Environmental	Contamination	
Contaminated Land Management Regulation 2013	Regulation	2013	2013	Current	Environmental	Contamination	
Contractors Debts Act 1997	Act	1997	2009	Current	Commercial	Contracts	
Contracts Review Act 1980	Act	1980	2016	Current	Commercial	Contracts	
Control Of Work-Related Exposure To Hepatitis And Hiv (Blood-Borne) Viruses	Code of Practice	2004	NA	Current	Safety	Disease	CoP- under NSW OHS Act 2000
Crimes Act 1900	Act	1900	2019	Current	Criminal	Criminal	
Crown Land Management Act 2016	Act	2016	2019	Current	Environmental	land	
Crown Land Management Regulation 2018	Regulation	2018	2019	Current	Environmental	land	
Cutting and Drilling Concrete and Other Masonry Products	Code of Practice	1996	1996	Current	Safety	Cutting and Drilling	CoP- under NSW OHS Act 2000
Dangerous Goods (Road and Rail Transport) Act 2008	Act	2008	2018	Current	Safety	Chemicals/Transport	
Dangerous Goods (Road and Rail Transport) Regulation 2014	Regulation	2014	2019	Current	Safety	Chemicals/Transport	
Demolition work	Code of Practice	2012	2016	Current	Safety	Demolition	
Dividing Fences Act 1991	Act	1991	2018	Current	other	other	
Electricity Supply (Corrosion Protection) Regulation 2014	Regulation	2014	2017	Current	Energy Supply	Electrical	
Electricity Supply (General) Regulation 2014	Regulation	2014	2019	Current	Energy Supply	Electrical	
Electricity Supply (Safety and Network Management) Regulation 2014	Regulation	2014	2018	Current	Energy Supply	Electrical	
Electricity Supply Act 1995	Act	1995	2019	Current	Energy Supply	Electrical	
Employment Protection Act 1982	Act	1982	2016	Current	employment	employment	
Environmental Planning and Assessment Act 1979	Act	1979	2019	Current	Environmental	Planning	
Environmental Planning and Assessment Regulation 2000	Act	2000	2019	Current	Environmental	Planning	
Environmental Trust Act 1998	Regulation	1998	2018	Current	Environmental	heritage	
Environmentally Hazardous Chemicals Act 1985	Act	1985	2018	Current	Environmental	Chemicals	
Excavation work	Code of Practice	2012	2015	Current	Safety	Excavation	
Explosives Act 2003	Act	2003	2017	Current	Explosives	Explosives	
Explosives Regulation 2013	Regulation	2013	2017	Current	Safety	explosives	
Fair Trading Act 1987	Act	1987	2019	Current	Consumer	Commercial	

Doc. No: C-PRE-F001 Rev. No: 05 Date: 28.08.2019 Page No 1 of 4

NEW SOUTH WALES

Law and Code Title	Type	In force	Date Current	Status	Category	Sub- Category	Comments
Fair Trading Regulation 2012	Regulation	2012	2019	Current	Consumer	other	
First aid in the workplace	Code of Practice	2012	2016	Current	Safety	First Aid	
Formwork	Code of Practice	1998	NA	Current	Safety	Formwork	CoP- under NSW OHS Act 2000
Frustrated Contracts Act 1978	Act	1978	2015	Current	commercial	Contracts	
Gas Supply (Safety and Network Management) Regulation 2013	Regulation	2013	2017	Current	Energy Supply	Gas	
Gas Supply Act 1996	Act	1996	2018	Current	Energy Supply	Gas	
Hazardous Manual Tasks	Code of Practice	2012	2016	Current	Safety	Manual Tasks	
Heritage Act 1977	Act	1977	2018	Current	Environmental	heritage	
Heritage Regulation 2012	Regulation	2012	2018	Current	Environmental	heritage	
How to Manage and Control Asbestos in the Workplace	Code of Practice	2012	2016	Current	Safety	Asbestos	
How to Manage Work Health and Safety Risks	Code of Practice	2012	2012	Current	Safety	Risk	
How to Safely Remove Asbestos	Code of Practice	2012	2016	Current	Safety	Asbestos	
Implementation Guidelines to the NSW Code of Practice for Procurement: Building and	Guide	2013	2013	Current	Prequalification	Tendering	
Industrial Relations (Commonwealth Powers) Act 2009	Act	2009	2010	Current	Employment	Employment	
Industrial Relations (General) Regulation 2015	Regulation	2015	2019	Current	Employment	Employment	NSW Govt employees only
Industrial Relations (National System Employers) Order 2009	Regulation	2009	2018	Current	Employment	Employment	NSW Govt employees only
Industrial Relations Act 1996	Act	2012	2019	Current	Employment	Employment	NSW Govt employees only
Industrial Relations Advisory Council Act 2010	Act	2010	2014	Current	Employment	Employment	
Industrial Relations Commission Rules 2009	Rules	2009	2014	Current	Employment	Employment	
Interim Construction Noise Guideline	Guide	2009	2009	Current	Environmental	Noise	
Interpretation Act 1987	Act	1987	2018	Current	Safety	Interpretation	
Labelling of Workplace Hazardous Chemicals	Code of Practice	2012	2016	Current	Safety	Hazardous Substances	
Library Amendment Act 2019	Act	2019	2019	Current	Commerical	Commerical	
Long Service Leave Act 1955	Act	1955	2016	Current	employment	leave	
Managing electrical risks at the workplace	Code of Practice	2012	2016	Current	Safety	Electrical	
Managing Noise and Preventing Hearing Loss at Work	Code of Practice	2012	2016	Current	Safety	Noise	
Managing risks of hazardous chemicals	Code of Practice	2012	2014	Current	Safety	Hazardous Substances	
Managing risks of plant in the workplace	Code of Practice	2012	2014	Current	Safety	Plant	
Managing the Risk of Falls at Workplaces	Code of Practice	2012	2016	Current	Safety	Falls	
Managing the Work Environment and Facilities	Code of Practice	2012	2012	Current	Safety	Amenities	
Marine Pollution Act 2012	Act	2012	2017	Current	Environmental	Pollution	
Marine Pollution Regulation 2014	Regulation	2014	2015	Current	Environmental	Marine	
Moving plant on construction sites: Code of Practice	Code of Practice	2004	2004	Current	Safety	Plant	CoP- under NSW OHS Act 2000
National Environment Protection Council (New South Wales) Act 1995	Act	1995	2004	Current	Environmental	Environmental	
National Rail Corporation (Agreement) Act 1991	Act	1991	2010	Current	Safety	Rail	
NSW Code of Practice for Procurement	Code of Practice	2005	2005	Current	Prequalification	Tendering	
NSW Code of Practice for Procurement: Building and Construction	Code of Practice	2013	2013	Current	Prequalification	Tendering	
NSW Environmental Management Systems Guidelines	Guide	2013	2013	Current	Prequalification	Tendering	
NSW Government Aboriginal Participation in Construction Guidelines	Guide	2007	2007	Current	Prequalification	Tendering	
NSW Industrial Noise Policy	Policy	2000	2000	Current	Environmental	Noise	
NSW Work Health and Safety Management Systems and Auditing Guidelines	Guide	2013	2013	Current	Prequalification	Tendering	
Overhead protective structures	Code of Practice	1995	1995	Current	Safety	Overhead Protection	CoP- under NSW OHS Act 2000
Payroll Tax Act 2007	Act	2007	2018	Current	Employment	Employment	
Preparation of Safety Data Sheets for Hazardous Chemical	Code of Practice	2012	2012	Current	Safety	Hazardous Substances	
Preventing falls in housing construction	Code of Practice	2012	2014	Current	Safety	Falls	
Privacy and Personal Information Protection Act 1998	Act	1998	2017	Current	Employment	Employment	

NEW SOUTH WALES

Law and Code Title	Type	In force	Date Current	Status	Category	Sub- Category	Comments
Privacy and Personal Information Protection Regulation 2019	Regulation	2019	2019	Current	Employment	Employment	
Privacy Code of Practice (General) 2003	Code of Practice	2003	2017	Current	Employment	Employment	
Protection of the Enivronment Administration Regulation 2012	Regulation	2012	2012	Current	Environmental	Environmental	
Protection of the Environment Administration Act 1991	Act	1991	2018	Current	Environmental	Environmental	
Protection of the Environment Operations (Clean Air) Regulation 2010	Act	2010	2016	Current	Environmental	Environmental	
Protection of the Environment Operations (General) Regulation 2009	Regulation	2009	2019	Current	Environmental	Environmental	
Protection of the Environment Operations (Underground Petroleum Storage Systems)	Regulation	2014	2015	Current	Environmental	Environmental	
Protection of the Environment Operations (Waste) Regulation 2014	Regulation	2014	2018	Current	Environmental	Environmental	
Protection of the Environment Operations Act 1997	Regulation	1997	2018	Current	Environmental	Environmental	
Quality Management System Guidelines (for construction)	Guide	2013	2013	Current	Prequalification	Tendering	
Rail Infrastructure Noise Guideline	Guide	2013	2013	Current	Environmental	Environmental	
Rail Safety (Adoption of National Law) Act 2012	Act	2012	2018	Current	Safety	Rail Operation-Construction	
Rail Safety National Law (NSW)	Act	2012	2019	Current	Safety	Rail Operation-Construction	
Rail Safety National Law National Regulations 2012	Regulation	2012	2019	Current	Safety	Rail Operation-Construction	
Restraints of Trade Act 1976	Act	1976	2015	Current	Commerical	Commerical	
Road Obstructions (Special Provisions) Act 1979	Act	1979	2013	Current	Road Safety	Road Safety	
Road Obstructions (Special Provisions) Regulation 1990	Regulation	1990	1990	Current	Road Safety	Road Safety	
Road Rules 2014	Regulation	2014	2019	Current	Road Safety	Road Safety	
Road Transport (General) Regulation 2013	Regulation	2013	2019	Current	Road Safety	Road Safety	
Road Transport (Vehicle Registration) Regulation 2017	Regulation	2007	2019	Current	Road Safety	Road Safety	
Road Transport Act 2013	Act	2013	2019	Current	Road Safety	Road Safety	
Roads Act 1993	Act	1993	2018	Current	Road Work	Road Work	
Royal Botanic Gardens and Domain Trust Act 1980	Act	1980	2018	Current	Eviromental	Environmental	
Royal Botanic Gardens and Domain Trust Regulation 2013	Regulation	2013	2019	Current	Eviromental	Eviromental	
Safe design of structures	Code of Practice	2012	2014	Current	Safety	Design Safety	
Safe use of bulk solids containers and flatbed storage including silos, field bins and chaser bins	Code of Practice	2006	2006	Current	Safety	Bulk Solids Containers	CoP- under NSW OHS Act 2000
Safe use of pesticides in non-agricultural workplaces	Code of Practice	2006	2006	Current	Safety	Pesticides	CoP- under NSW OHS Act 2000
Safe Use of Synthetic Mineral Fibres	Code of Practice	1993	1993	Current	Safety	Hazardous Substances	CoP- under NSW OHS Act 2000
Safe work on roofs, Part 1 - Commercial and industrial buildings	Code of Practice	2009	2009	Current	Safety	Safety	CoP- under NSW OHS Act 2000
Skills and training in the construction industry	Guide	2013	2013	Current	Prequalification	Tendering	
Soil Conservation Act 1938	Act	1938	2018	Current	Eviromental	Environmental	
Spray painting and powder coating	Code of Practice	2015	2015	Current	Safety	Spray Painting	
Superannuation Act 1916	Act	1916	2018	Current	Employment	Employment	
Superannuation Administration Act 1996	Act	1996	2019	Current	Employment	Employment	
Superannuation Regulation 2016	Regulation	2016	2016	Current	Employment	Employment	
Sydney Water Act 1994	Act	1994	2019	Current	Environmental	Environmental	
Taxation Administration Act 1996	Act	1996	2019	Current	Commerical	Tax	
Technical Guidance	Code of Practice	2001	NA	Current	Safety	Aust Standards Various	CoP- under NSW OHS Act 2000
Trustee Act 1925	Act	1925	2018	Current	commerical	commerical	
Trustee Regulation 2015	Regulation	2015	2015	Current	Commerical	Commerical	
Tunnels Under Construction	Code of Practice	2006	2006	Current	Safety	Tunnels	CoP- under NSW OHS Act 2000
Waste Avoidance and Resource Recovery Act 2001	Act	2001	2018	Current	Eviromental	Environmental	
Water (Part 2 - General) Regulation 1997	Act	1997	2018	Current	Eviromental	Environmental	
Water Act 1912	Act	1912	2018	Current	Eviromental	Environmental	
Water Management (General) Regulation 2018	Act	2018	2019	Current	Eviromental	Environmental	
Water Management Act 2000	Act	2000	2019	Current	Eviromental	Environmental	

NEW SOUTH WALES

Law and Code Title	Type	In force	Date Current	Status	Category	Sub- Category	Comments
Water NSW Act 2014	Act	2014	2018	Current	Environmental	Environmental	
Water Savings Order 2005	Order	2005	2011	Current	Eviromental	Environmental	
Welding processes	Code of Practice	2012	2016	Current	Safety	Welding	
Work Health & Safety Act 2011	Act	2012	2017	Current	Safety	Safety	
Work Health & Safety Regulation 2017	Regulation	2017	2019	Current	Safety	Safety	
Work Health and Safety Consultation Cooperation and Coordination	Code of Practice	2012	2012	Current	Safety	Safety	
Workers Compensation Act 1987	Act	1987	2019	Current	Workers Compensation	Workers Compensation	
Workers Compensation Regulation 2016	Regulation	2010	2018	Current	Workers Compensation	Workers Compensation	
Workers' Compensation (Dust Diseases) Act 1942	Act	1942	2018	Current	Workers Compensation	Workers Compensation	
Workers' Compensation (Dust Diseases) Regulation 2018	Regulation	2018	2018	Current	Workers Compensation	Workers Compensation	
Working Near Overhead Powerlines	Code of Practice	2006	2006	Current	Power lines	Power lines	CoP- under NSW OHS Act 2000
Workplace Injury Management and Workers Compensation Act 1998	Act	1998	2018	Current	Workers Compensation	Workers Compensation	

APPENDIX E: EIG001; EROSION, SEDIMENT, SURFACE RUN OFF

HINDMARSH
Leadership at work

EIG001 – Soil Erosion, Sediment, Surface Run Off

Project Name:			
Revision:		**Date of Last Revision:**	
Reviewed by:			

1. PROCESS SUMMARY

To minimise the potential for erosion of the site and sedimentation in the adjoining properties, waterways, dams and drains.

2. OBJECTIVES

- No sedimentation of the adjoining properties, waterways, dams and drains.
- Minimal erosion on site;

3. DEFINITIONS

Not Applicable

4. RESPONSIBILITIES

Owner	Responsibility
Environmental Role	Is responsible for the construction and maintenance of the erosion and sediment control works. Is responsible (directly or indirectly) for cleaning and repairing erosion and sediment control works, and notifying the Project Manager of any failures.

5. PROCESS DESCRIPTION

5.1 Permits and Licenses

Not Applicable

5.2 Control Measures

The following control measures are to be fully operational and provide effective erosion control prior to disturbing adjacent ground and commencement of adjacent excavation.

Control or divert surface drainage entering the construction site	**Cross Box for Measures Relevant to Project**
Nominated resource to regularly assess the need for temporary run off control.	☐
Divert surface drainage by the installation of bunds, v-drains, swales and diversion channels.	☐
Install cut-off drains where long cut/fill battered slopes occur to control water run-off speed and erosion.	☐
Prevent sediment laden run-off entering adjoining areas, watercourses, drains and dams	☐
Construct silt traps (silt fences, straw bales) as necessary.	☐
Straw bales to be secured by two steel droppers.	☐
Ensure drain entry points are protected by silt socks or sand bags.	☐
Ensure silt traps are located at toe of stockpile batters.	☐
Protect exposed embankments using silt traps.	☐
Protect batter slopes with mulch, plant grass or plants.	☐
Seal off work areas prior to completing work each day by rolling and grading to ensure areas are free draining.	☐
Maintain minimum capacity of silt fences of 50% by regular removal of accumulated debris.	☐
Place material stockpiles clear of watercourses and storm water drain inlets and above normal highwater level of watercourses.	☐
Do not wash out trucks etc., within 20m of drainage system or natural watercourses.	☐

Prevent soil loss from disturbed areas through wind and water erosion	**Cross Box for Measures Relevant to Project**

Stage the works to minimise the amount of exposed areas.	☐
Strip topsoil immediately after clearing.	☐
Use stripped topsoil to rehabilitate other areas if possible.	☐
As a priority protect exposed embankments using silt fences and straw bales.	☐
Regularly water exposed surfaces where wind erosion may occur.	☐
Rehabilitate cleared areas ASAP.	☐
Grass exposed surfaces if exposed for an extended time.	☐

Prevent soil loss from stockpiles through wind and water erosion	**Cross Box for Measures Relevant to Project**
Regularly water exposed surfaces of stockpiles where wind erosion may occur.	☐
Construct swales around stockpiles as necessary.	☐
Stockpile materials away from drainage lines and cleared areas.	☐

Minimise damage and erosion by site traffic	**Cross Box for Measures Relevant to Project**
Plan and establish access and haul roads with agreement local authorities and client.	☐
Existing tracks or final road alignment to be used whenever possible.	☐
Avoid construction of parallel and multiple tracks.	☐
Restrict vehicular movement over cleared areas.	☐
Adequate signage to be in place to ensure safe movement of vehicles and to discourage access away from haul roads.	☐
Maintain water quality.	☐
Test surface water quality to ensure discharge offsite to waterways complies with contract and regulatory requirements.	☐
Check weather forecast prior to priming, sealing and painting activities and ensure bonding or other controls are in place to limit contamination of waterways.	☐

5.3 Monitoring

- Inspect the erosion and sediment control devices weekly and before and after a significant storm event.
- Observe the erosion and sediment control devices daily to ensure correct functioning and placement and that available capacity is adequate.
- Observe any signs of erosion or sedimentation after every significant storm event and once per week at other times.
- If applicable inspect adjacent properties, waterways, dams, drains for the presence of silt, contaminates, litter, erosion.
- Undertake water sampling if required by the contract or by regulator.

5.4 Emergency Response

Please refer to the project's *Emergency Management Plan (EMP)* for information regarding emergency preparedness and response. The project-specific Emergency Management Plan ensures Hindmarsh controls, and assesses Emergency preparedness elements as required for the project.

Specific to this EIG, in the event of any significant failure of the erosion and sediment control devices:

- The Environmental Role is to reinstate the erosion and sediment control works as soon as practical.
- If failure constitutes a threat to the environment and or an adjoining waterway, the Site Manager is to follow incident reporting procedures as detailed within 5.5

5.5 Incident Reporting

Refer to the *Injury, Illness and Incident Management and Reporting* flow chart for detailed guidance regarding the management and reporting of injuries, illness and incidents.

Procedures and processes referenced within the above mentioned document address the following:

- Detailed definitions
- Reporting responsibilities and obligations (both internal and external)
- Incident Reporting responsibilities and expectations
- Site and or National Investigation requirements
- Corrective and Preventive Action
- Analysis of data \ findings (including Objectives \ Targets status)

6. RECORDS

Keep written record showing:

- *Weekly Environmental & Sustainability Checksheet*

7. REFERENCES

Internal References	Compass Ref No.
Environmental Management Plan	C-PRE-M005
Environmental Risk and Opportunity Profile	C-PRE-F016

External References

Document Title	Section	Date \ Revision
Refer to ENV Risk Profile for external resource references		

APPENDIX F: EIG004; NOISE EMMISSIONS

HINDMARSH
Leadership at work

EIG004 – Noise Emissions

Project Name:			
Revision:		**Date of Last Revision:**	
Reviewed by:			

1. PROCESS SUMMARY

To limit the level of noise generated by the construction works so that it does not cause an environmental nuisance to nearby residents and the general public. The following contains advice on managing and monitoring noise levels associated with site works.

2. OBJECTIVES

To provide monitoring information and advice to ensure that noise levels experienced on site and surrounding the site can be adequately managed. Specifically:

- To minimize \ avoid adverse noise impacts associated with the day to day operations of plant, machinery and task through construction methods and management measures.
- Comply with relevant EPA requirements
- Comply with local or site specific requirements.

Target:

- To monitor noise prior to start at pre-selected locations so that background noise levels can be established and compared against throughout the project life.
- Monitor noise levels generated from plant and equipment and construction activities.
- Maintain noise levels below the accepted rise from the original readings (at surrounding locations).
- Noise complaints that are received from neighboring facilities are dealt with in an appropriate and timely manner.
- To minimise the occurrence of noise complaints associated with the site works from adjacent occupied areas, facilities and neighbors.

3. DEFINITIONS

Not Applicable

4. RESPONSIBILITIES

Owner	Responsibility
Environmental Role	The Environmental Role (or delegated resource) is responsible for the continual monitoring of noise levels on the site.

5. PROCESS DESCRIPTION

5.1 Permits and Licenses

Where construction activities require permits these must be obtained prior to works commencing – e.g. working outside of hours as stated by local Environmental Protection Authority.

5.2 Impacts

Excessive noise levels can result in a serious nuisance, hearing damage (noise induced hearing loss and tinnitus etc) and loss of usability of site areas and surrounding facilities.

5.3 Noise Generating Activities

	Cross Box for Measures Relevant to Project
Movement and reversing alarms of construction equipment, plant trucks, site vehicles;	☐
Materials equipment loading and unloading;	☐
Use of equipment such as concrete cutter, circular saws, nail guns, jack hammer, hand tools, generators , compressors;	☐
Mobile plant such as Concrete pumps, Agitators, Vibrators, crane operations;	☐

5.4 Control Measures

	Cross Box for Measures Relevant to Project
Complete Noise Study. Including establishment of 'normal' noise levels at the site prior to construction commencing.	☐
Working hours to be in accordance with contractual and legislative limitations.	☐
Execute noise generating tasks within the project central area rather than along perimeters, i.e. do not drop rubbish into bins and or loads into trucks from excessive heights or without due care.	☐
Coordinate site works to maximise the use of existing site features as sound barriers where possible.	☐
Install temporary or project life hoardings along sensitive areas such as solid panels in preference to mesh panels.	☐
Install temporary, mobile sound barriers or enclosures around noisy tasks, activities and or plant such as	☐

brick saws. Possible use of 6mm plywood on timber framing with no gaps at joints or corners. The inside of enclosure lined with sound absorption material (e.g. perforated foil faced fiberglass). These enclosures may be moved as required to achieve maximum benefit for the nearest affected premises, building and or user.	
Induction training will address noise awareness, noise sensitive areas and the need to make as little noise as possible, such as avoiding shouting and whistling.	☐
All site personnel must adhere to site safety rules in relation to hearing PPE when operating or in the vicinity of noise generating plant or equipment when other hierarchy of controls has been eliminated.	☐
Care shall be taken not to drop materials ensuring no peak noise events occur, including materials from a height into a truck or skip.	☐
Traffic controllers will prevent queuing, idling or reversing near noise sensitive receivers.	☐
No music radios or music generating devices are permitted on site	☐
Plant and Equipment Controls	☐
Vehicle warning devices such as horns are only to be used in case of emergency or where there is imminent threat of danger.	☐
All plant and equipment to be regularly serviced in accordance with manufacturers' specification.	☐
Eliminate noisy work practices, shut down plant and do not leave it idling unnecessarily, substitute for something that does not generate as much noise.	☐
Generators and or other noisy plant are to be situated to minimise noise disturbance to local residents and the general public.	☐
Noisy equipment to be removed from site.	☐
Trucks and plant to follow approved, designated transport routes.	☐
Ensure silencers and enclosures are intact, rotating elements of plant and equipment is balanced, loose bolts are tightened, and frictional noise is reduced through lubrication and cutting noise reduced by maintained sharp equipment.	☐
Use only necessary power to complete the task at hand. The correct tool, plant and or equipment for the activity.	☐
Ensure equipment is fitted with adequately maintained silencers \ mufflers which meet the design specifications.	☐
Plant known to emit noise strongly in one direction shall be orientated so that the noise is directed away from noise sensitive areas where practicable.	☐
Trucks to be loaded within legal limits for travel on public roads.	☐
Where possible plant and equipment to be selected with lowest noise rating or to have silencing and noise suppression equipment fitted.	☐
Other	☐
Use of BBS-TEK Backalarm or similar system	☐
Acoustically enclose generators and compressors where possible	☐
Off site access is to be located as far away as possible from noise sensitive receivers	☐

5.5 Monitoring

General

Observation of noise levels from equipment, vehicles and operation during working hours

Monitoring Devices

To be determined as soon as possible prior to site works commencing.

Noise Monitoring Location Plan:

To be completed as soon as possible prior to site works commencing.

5.6 Emergency Response

- Cease noisy work and consider alternative methods.
- Repair or service noisy equipment.

The above tasks may be included within the *Emergency Management Plan*. This document may be attached to the *Emergency Management Plan*.

5.7 Incident Reporting

Refer to the *Injury, Illness and Incident Management and Reporting* flow chart for detailed guidance regarding the management and reporting of injuries, illness and incidents.

Procedures and processes referenced within the above mentioned document address the following:

- Detailed definitions
- Reporting responsibilities and obligations (both internal and external)
- Incident Reporting responsibilities and expectations
- Site and or National Investigation requirements
- Corrective and Preventive Action
- Analysis of data \ findings (including Objectives \ Targets status)

5.8 Training

- All Hindmarsh Site Staff to be inducted into the *Environmental Management Plan*.

- Relevant Personnel to complete Manger / Supervisor Training in Noise Management this may include a basic grasp of noise terminology, methods of noise measurement, knowledge of current Acts and Regulations OHS&E.
- All site contractors to be inducted into the site specific induction.

6. RECORDS \ REPORTING (as required)

- *Weekly SQE Inspection,*
- *Weekly Environmental & Sustainability checklist,*

In the event of a complaint record the following via the Action Required Notification:

- A complaint or the recording of successive excessive noise levels above the determined surrounding levels may result in the following corrective actions being implemented
- Address complaint and respond with and implement proposed mitigation measures
- Retraining , removal, re induction, review
- Monitor updated control measures for effectiveness

7. REFERENCES

Internal References	**Compass Ref No.**
Environmental Management Plan	C-PRE-M005
Environmental Risk and Opportunity Profile	C-PRE-F016
Equipment Calibration Register	C-PRE-F007
Weekly Environmental & Sustainability Checksheet	C-CON-F019
Environmental Noise Monitoring Report	C-CON-F030
Emergency Management Plan	C-PRE-M004

External References		
Document Title	**Section**	**Date \ Revision**
Refer to ENV Risk Profile for external resource references		

APPENDIX G: EIG007; STORAGE, MAINTENANCE, REFUEL

HINDMARSH
Leadership at work

EIG007 – Storage, Maintenance, Refuel

Project Name:			
Revision:		**Date of Last Revision:**	
Reviewed by:			

1. PROCESS SUMMARY

Minimise contamination of the soil or waters on and in the vicinity of the work caused by oil or fuel leak or spillage.

2. OBJECTIVES

No contamination of the soil or waters on and in the vicinity of the works

3. DEFINITIONS

Not Applicable

4. RESPONSIBILITIES

Owner	Responsibility
Environmental Role	The project team is to implement the fuels, chemicals and waste management procedures. All project team members are to notify the Project Manger of any significant breaches. The Environmental Role may inspect storage facilities and work practices and report non-conformances.

5. PROCESS DESCRIPTION

5.1 Permits and Licenses

Not Applicable

5.2 Control Measures

The following nominated control measures are as follows:

	Cross Box for Measures Relevant to Project
Carry out maintenance in designated area only. Designated areas to be located away from vegetation if possible.	☐
A hydrocarbon spill kit to be maintained and located close to designated maintenance, storage and refueling area.	☐
An Emergency Response Plan to be prepared and employees be inducted in its application.	☐
Specific personnel to be trained in the efficient deployment of the spill kit.	☐
Refueling location to be such that there is no possibility of discharge into a natural watercourse or storm water system in the event of accidental spillage.	☐
Fuel and oil storage facilities to be established in accordance with the requirements of AS1940. Storage facilities to be located away from watercourses and areas prone to flooding or tidal areas.	☐
If fuel storage tank is used place the tank on a clay platform surrounded by a clay or plastic lined earth bund sized to accommodate any potential spills.	☐
Any spills are to be rendered harmless and collected for treatment and disposed of at designated site including cleaning materials, absorbents and contaminated soils.	☐
Waste oil to be stored on site in a secure area and periodically removed from site to a licensed re-cycling facility. Refueling of machinery and vehicles to be carried out in a manner which prevents spills.	☐
Any maintenance or servicing of machinery and vehicles to be undertaken in accordance with best practice guidelines to minimise the potential for site contamination through oil or fuel leakage.	☐
Used oil filters to be drained overnight and disposed to a regulated waste facility.	☐
Maintain plant and vehicles so they have no oil/ fuel leaks.	☐

5.3 Monitoring

- Weekly inspection of the containment bunds and identify location of any spills
- Observation of plant maintenance and refuelling activities and identification of any spills and oil/fuel leaks.

5.4 Emergency Response

- Advise the Supervisor or Site Engineer and the spill response team.
- Cease work contain the spill, cleanup and correct disposal in accordance with the Emergency Response Plan.
- If the failure does not involve an environment threatening spillage review the control measures and amend as necessary.
- Identify the contaminant and ensure current removal and disposal as per legislative requirements.
- If the failure involves an environmental threatening spillage immediately notify parties as necessary in accordance with the Emergency Response Plan.

The above tasks are to be included within the *Emergency Management Plan*. This document may be attached to the *Emergency Management Plan.*

5.5 Incident Reporting

Refer to the *Injury, Illness and Incident Management and Reporting* flow chart for detailed guidance regarding the management and reporting of injuries, illness and incidents.

Procedures and processes referenced within the above mentioned document address the following:

- Detailed definitions
- Reporting responsibilities and obligations (both internal and external)
- Incident Reporting responsibilities and expectations
- Site and or National Investigation requirements
- Corrective and Preventive Action
- Analysis of data \ findings (including Objectives \ Targets status)

6. RECORDS

Keep written record showing:

- *Weekly Environmental & Sustainability Checksheet*,
- Other:
  - Incident reports of spills and their corrective actions.
  - Record any preventive actions undertaken.

7. REFERENCES

Internal References	Compass Ref No.
Environmental Management Plan	C-PRE-M005
Environmental Risk and Opportunity Profile	C-PRE-F016

External References		
Document Title	**Section**	**Date \ Revision**
Refer to ENV Risk Profile for external resource references		

APPENDIX H: EIG008; STORAGE, HANDLING OF HAZARDOUS / DANGEROUS SUBSTANCES / MATERIALS

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EIG008 – Storage, Handling Hazardous / Dangerous Substances / Materials

Project Name:			
Revision:		**Date of Last Revision:**	
Reviewed by:			

1. PROCESS SUMMARY

To eliminate, reduce and manage the storage and use of hazardous substances so as to prevent contamination of the soil and water or drains on and in the vicinity of the works.

2. OBJECTIVES

The elimination, reduction and management of toxic and harmful substance due to project works resulting in no contamination of the soil, water or drains on and in the vicinity of the works.

3. DEFINITIONS

Not Applicable

4. RESPONSIBILITIES

Owner	Responsibility
Environmental Role	The environmental role (or delegated resource) is to inspect storage facilities adjoining waterways, dams and drains and work practices and report non-conformances.

5. PROCESS DESCRIPTION

5.1 Permits and Licenses

Not Applicable

5.2 Control Measures

The following nominated control measures are as follows:

	Cross Box for Measures Relevant to Project
Material Safety Data (MSD) Sheets to be readily available and accessible for all hazardous substances used on site.	☐
Where particularly dangerous substances are used or stored, the MSD Sheets must be displayed at the storage area.	☐
Workers are to be made aware of the types, usage and storage requirements of hazardous substances found on site	☐
Hazchem signs to be displayed as necessary.	☐
The control, usage, transportation and storage of hazardous substances must be in accordance to manufacturers' instructions and any license requirements.	☐
Hazardous substances to be stored neatly in a secure container.	☐
Segregation requirements of hazardous substances to be complied with.	☐
All containers, carrying hazardous substances, to be clearly and correctly labeled.	☐
Storage areas for fuel and other hazardous substances to be placed away from watercourses, drains or dams or downstream whenever possible	☐
Storage areas for fuel and other hazardous substances to be bunded to prevent discharge in the event of a spillage.	☐
As necessary bund areas where motors are placed to prevent discharge of fuel or oil into any nearby water facility (e.g., a pump placed next to a dam).	☐
Construct pollution traps as necessary at entrances into storm water drains (i.e. grated drains, site entry pits etc.).	☐
Carry out works involving use of large quantities of hazardous substances (e.g. spray sealing) only when rain is not anticipated in the immediate future.	☐
Spillage response kits to be ready and accessible at all times and monitored for replenishment of contents sufficient to clean up spillages and prevent discharge to watercourses dams and drains.	☐

Doc. No: C-PRE-G013 Rev. No: 02 Page 1 of 2

Superintendent to be notified of spillage of hazardous substances where a potential of environmental harm/impact can occur.	☐
Trucks or vehicles carrying hazardous substances to be appropriately licensed, signed and to carry the required shipping and emergency response documentation.	☐

5.3 Monitoring

- Weekly inspection of storage facilities.
- Observation of the location and bunding of pumps, refuelling locations storage areas etc.
- Observation of pollution controls in drains and watercourses

5.4 Emergency Response

- In accordance with emergency procedures in the Project Management Plan to contain any spill and prevent substances entering water courses, dams and drains.
- If the failure does not involve an environment threatening spillage review the control measures and amend as necessary.
- Identify the contaminant and ensure current removal and disposal as per legislative requirements.
- If failure constitutes a threat to the environment the Site Manager is to follow incident reporting procedures as detailed within 5.5

The above tasks are to be included within the *Emergency Management Plan*. This document may be attached to the *Emergency Management Plan.*

5.5 Incident Reporting

Refer to the *Injury, Illness and Incident Management and Reporting* flow chart for detailed guidance regarding the management and reporting of injuries, illness and incidents.

Procedures and processes referenced within the above mentioned document address the following:

- Detailed definitions
- Reporting responsibilities and obligations (both internal and external)
- Incident Reporting responsibilities and expectations
- Site and or National Investigation requirements
- Corrective and Preventive Action
- Analysis of data \ findings (including Objectives \ Targets status)

6. RECORDS

Keep written record showing:

- *Weekly Environmental & Sustainability Checksheet*

7. REFERENCES

Internal References	Compass Ref No.
Environmental Management Plan	C-PRE-M005
Environmental Risk and Opportunity Profile	C-PRE-F016

External Reference

Document Title	Section	Date \ Revision
Refer to ENV Risk Profile for external resource references		

APPENDIX I: INJURY, ILLNESS AND INCIDENT MANAGEMENT REPORTING

Incident Management

COMPASS » Construction » Construction » Project Delivery » Incident Management

This procedure identifies Hindmarsh requirements for incidents occuring at the workplace so as to learn from these in order to prevent recurrence.

<table>
<tr><th>Step</th><th>Control Requirements</th><th>Responsibili</th></tr>
<tr><td>Immediate Action</td><td>Provide first aid to injured person and/or make site safe where safe to do so.
In the event of an emergency the Emergency Management Plan (EMMP) shall be implemented in accordance with the Emergency Management procedure.
In the event of a Critcial Incident provide immediate notification to your line manager. The CEO shall be repsonsible for activating the Crisis Management and Recovery (CMR) Plan in accordance with the Emergency Management procedure.
The following events are defined as Critical Incidents:
- Fatalities;
- Serious negative business occurences;
- Serious management failure, fraud or misconduct;
- Serious perceptual damage to Hindmarsh's reputation;
- An escalating incident of any kind; or
- any situation declared by the Chief Executive Officer (CEO).</td><td>Project Manager</td></tr>
<tr><td>Incident Classification</td><td>The Incident Classification table and the SQE Definitions shall be used to assist with incident classification, notification, investigation and reporting requirements:
<table>
<tr><th>Incident Classification</th><th>Business Reportable</th><th>State Reportable</th><th>Project Reportable</th></tr>
<tr><td>Safety</td><td>Notifiable Incident
Dangerous Incident/Occurrence
Lost time injury (LTI) or illness</td><td>Medical treatment injury (MTI) or illness
First aid treatment - Investigation Required
Near Miss
Incident (not regulatory reportable)</td><td>First aid treatment - No Investigation Required (eg minor lacerations, splinter removal etc)</td></tr>
<tr><td>Environmental</td><td>Environment damage with remedy costs >$50,000</td><td>Environment damage with remedy costs <$50,000</td><td>Insignificant or no impact on environment</td></tr>
<tr><td>Property</td><td>>$50,000 property damage, costs to remedy or repair</td><td>>$1,000 property damage, costs to remedy or repair</td><td><$1,000 property damage, costs to remedy or repair</td></tr>
<tr><td>Notification Timeline</td><td>Verbally within 1 hour
Entered in OnSite within 24 hours</td><td colspan="2">Entered in OnSite within 2 working days</td></tr>
<tr><td>Automatic OnSite Notification</td><td>- CEO
- National SQE Manager
- State Manager Construction
- State SQE Manager
- Project Manager</td><td>- National SQE Manager
- State Manager Construction
- State SQE Manager
- Project Manager</td><td>- N/A</td></tr>
<tr><td>External Notification</td><td>- Regulatory Authority
- OFSC for LTI (Scheme/ Non-Scheme Projects)</td><td>- OFSC for MTI (Scheme Project Only)</td><td>- N/A</td></tr>
<tr><td>Investigation</td><td>- Incident Report to be completed in OnSite within 20 days by SQE Manager</td><td>- Incident Report to be completed in OnSite within 20 days by SQE Manager</td><td>- Investigate if FAI had potential to be State or Business Reportable</td></tr>
<tr><td>Incident Report Review/Signoff</td><td>- CEO
- National SQE Manager
- State Manager Construction
- State SQE Manager
- Project Manager</td><td>- State Manager Construction
- State SQE Manager
- Project Manager</td><td>- NA</td></tr>
<tr><td>Internal Reporting</td><td colspan="3">Board Report</td></tr>
</table></td><td>Project Manager</td></tr>
</table>

Step	Control Requirements	Responsibili
Verbal Notification - Business Reportable Incidents	Each Manager shall be responsible for ensuring incidents involving employees, contractors and visitors are reported, investigated and corrective actions assigned and completed. Verbal notification shall be made within 1 hour of the incident as follows. Where a line manager is unavailable, the next line manager shall be contacted. 	Project Manager
Incident Reporting	Incidents shall be reported via Hindmarsh ONSITE >> SQE >> Incidents module ensuring Parts A to E are completed as appropriate: Part A - incident details, immediate actions and personnel involved and injury details; Part B - incident response and ouctomes; Part C - Root cause, corrective actions and level of action required; Part D - Witness statements; Part E - incident close out.	State SQE Manager
Investigation	The ONSITE Incident module contains approval workflows and digital signoffs that shall be used to assist SQE Managers conduct the investigation to identify causal factors and actions for improvement. ONSITE records information and associated documents relating to the incident. In certain circumstances (eg for Dangerous Incident/Occurrence) the SQE Systems Manager can engage the services of an investigator with higher order investigation training though an accredited RTO (eg ICAM training) to conduct or assist investigations. Where investigations identify improvement to Compass these shall be managed via the Continual Improvement procedure and communicated to relevant stakeholders. The Serious SQE Incident Alert may be used to communicate lessons learned for continual improvement opportunities. Information related to incidents, including Incident Reports and associated documents shall not be issued externally without CEO approval.	National SQE Manager
Incident Review and Lessons Learned	A Serious SQE Incident Alert may be issued within Hindmarsh to communicate lessons learned and actions required arising from: - Notifiable Incidents; - Dangerous Incidents / Occurrences; or - Critical Incidents where the Crisis Management and Recovery Plan has been enacted. Alerts may also be issued for relevant regulatory/industry alerts, or where directed via National SQE meetings to address relevant issues of recurring incidents. A review of Notifiable Incidents, Dangerous Incidents/Occurrences and Critical Incidents shall be conducted to determine the ongoing suitability and effectiveness of the incident management process. This shall be conducted with team input and suggestions for improvement identified within the incident sign off section in ONSITE > SQE > Incidents module. Improvements to how the **incident was managed** process was implemented shall be addressed through ONSITE > SQE > CAR's. Improvements to the management system **as a result of the review** shall be addressed through the Continual Improvement process.	National SQE Manager
Training - Incident Investigation	SQE Managers, trained in the Hindmarsh Incident Management procedure and ONSITE Incident module shall be repsonsible for leading incident investigations. **The SQE Training Matrix shall identify other employees requiring Incident Management training.**	State SQE Manager

APPENDIX J: ENVIRONMENT RISK AND OPPORTUNITY PROFILE

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Project Name: Eastern Creek

Developed & Assessed By: Stuart Bell
Reviewed & Approved By:

Environmental Risk Assessment

Aspect	Impact	Is this a Potential Impact? Y/N	Risk Assessment: Consequence	Risk Assessment: Likelihood	Risk Assessment: Risk Score	Action to Control Potential Impact	Task Responsibility	HCA Sign Off	Monitoring
Sediment and Erosion	Soil erosion	No	Severe	Very Likely	H-2	EIG002 - Disturbance Flora Fauna	Hindmarsh	Project Manager	SWMS Field Assessment
	Sediment	No	Severe	Very Likely	H-2	EIG002 - Disturbance Flora Fauna	Hindmarsh	Project Manager	SWMS Field Assessment
	Surface run off	Yes	Minor	Very Likely	**M-17**	EIG002 - Install mesh and sand bags to prevent dirt and debris entering drains whilst re-creating sediment control dams	Hindmarsh	Compass	Compass
HAZARD	Disturbance of flora and fauna	No	Major	Unlikely	**HM-9**	EIG002 - Disturbance Flora Fauna	Hindmarsh	Compass	Compass
CRITICAL NOTE - Do not duplicate hazards as identifed on Tab 3 (eg public protection, site security). These hazards are standard and controls implemented inherantly protect client / other entities. Record here additional hazard as identified via consultation which are not already addressed by Tab 3.	Disturbance of aquatic flora and fauna	No	Severe	Almost Certain	VH-1	EIG010 - Presence of Infectious Plant, Disease and/or Weeds	SQE Manager	SWMS Field Assessment	Compass
	Spread of infectious plant, disease and/or weeds	No	Severe	Almost Certain	VH-1	EIG010 - Presence of Infectious Plant, Disease and/or Weeds	SQE Manager	SWMS Field Assessment	Compass
	Noise emissions	No	Moderate	Possible	M-13	EIG004 - Noise Emissions	Hindmarsh	Compass	Compass
	Atmospheric emissions	No	Moderate	Possible	M-13	EIG005 - Atmospheric Emissions	Hindmarsh	Compass	Compass
	Vibration	No	Moderate	Possible	M-13	EIG006 - Vibration	Hindmarsh	Compass	Compass
Storage and Handling of Materials and Substances	Leaks / spillage of materials or substances	Yes	Moderate	Possible	**M-13**	EIG007 - Storage, Maintenance, Refuel	Hindmarsh	Compass	Compass
	Leaks / spillage of hazardous materials or dangerous substances	No	Moderate	Possible	M-13	EIG008 - Storage Handling Hazardous / Dangerous Substances / Materials	Hindmarsh	Compass	Compass
	Contact with PCBs or contamination of surrounding soils and / or	No	Severe	Unlikely	HM-4	EIG018 - PCB Management	Hindmarsh	Compass	Compass
Community	Negative social impact	No	Severe	Very Likely	H-2	EIG012 - Disturbance Cultural Heritage	Hindmarsh	Compass	Compass
	Disturbance of cultural or heritage items	No	Moderate	Unlikely	L-14	EIG012 - Disturbance Cultural Heritage	Hindmarsh	Compass	Compass
	Negative visual impact	No	Moderate	Possible	M-13	EIG014 - Visual Amenity	Hindmarsh	Compass	Compass
Land Contamination	Soil contamination in the vicinity of the site	Yes	Moderate	Possible	**M-13**	EIG013 - Land Contamination	Hindmarsh	Compass	Compass
	Contamination due to acid sulphate soils	No	Severe	Almost Certain	H-1	EIG018 - Acid Sulphate Soils	Hindmarsh	Project Manager	SWMS Field Assessment
	Contamination of soils / water due to ballast	No	Severe	Rare	HM-5	EIG017 - Ballast	Hindmarsh	Compass	Compass
Resource management	Energy consumption	No	Severe	Almost Certain	VH-1	EIG019 - Energy and/or Water Consumption	Hindmarsh	SQE Manager	SWMS Field Assessment
	Water consumption	No	Severe	Almost Certain	VH-1	EIG019 - Energy and/or Water Consumption	Hindmarsh	SQE Manager	SWMS Field Assessment
	Solid waste treatment	No	Moderate	Possible	M-13	EIG011 - Solid and/or Liquid Waste Recycling	Hindmarsh	Compass	Compass
	Liquid waste treatment	No	Severe	Almost Certain	VH-1	EIG011 - Solid and/or Liquid Waste Recycling	Hindmarsh	SQE Manager	SWMS Field Assessment
Potential Emergencies	This includes project specific potential emergencies that are ouside the standard EIG controls								
	Major Chemical Spill	No	Severe	Possible	H-3	**Emergency Management Plan EMMP Standing Orders, SWMS**	Hindmarsh	Project Manager	SWMS Field Assessment
	Major Waterway Pollution	No	Severe	Possible	**H-3**	**Emergency Management Plan EMMP Standing Orders , SWMS**	Hindmarsh	Project Manager	SWMS Field Assessment

Doc. No: C-PRE-P025

Rev. No: 07 Date: 14.06.2017

Page 1 of 1

APPENDIX K:
EQUIPMENT CALIBRATION REGISTER

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Equipment Calibration Register

Calibration intervals
Measuring devices and tools shall be inspected, repaired and calibrated at regular intervals for proper operation and accuracy. A periodic measuring device and tool recalibration program shall be developed based upon the measurement equipment's stability, purpose, usage and environmental conditions. Using manufacturer guidelines calibration requirements will be detailed in the table below.

NOTE: Normal operating conditions do not include: Dropping, Overloading, Working outside the environmental conditions specified by the manufacturer, working in a severe operating condition.

In the event the device is suspected of being damaged, then the device shall be recalibrated immediately. In some instances damage is not readily discernable. Severe operating conditions involve a device being used in an operating environment that involves the potential for the device to lose its calibration due to frequent use, environmental conditions or rough handling. The Project Team will develop a schedule on recalibrating measuring devices that operate under severe operating conditions more frequently than the guidelines.

Measuring Devices

Element	On Site (Yes \ No)	Normal Operating Conditions (Yes \ No)	Name Device Is	Model	Serial Number Is	Initial Calibration Date	Calibrated By: (ensure all copies of calibration records are maintained on site)	Calibration Requirement (as Per Manufacturer Guidelines or as Scheduled by Project Team)	CMO Updated with Schedule Requirements (Yes \ No)
SAFETY AND ENVIRONMENT									
Dust Measuring Devices									
Noise Dose Meters									
Vibration meters									
WEATHER									
Weather Stations									
CONSTRUCTION \ QUALITY									
Laser Meters									
Survey Equipment									
PROJECT REQUIREMENTS									
N/A									

Record Management
All calibration records must be maintained on site.

Doc No. C-PRE-F007 Rev. No: 01 Page no 1 of 1

APPENDIX L: INCIDENT NOTIFICATION AND REPORTS REQUIREMENTS

INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS

WRITTEN INCIDENT NOTIFICATION REQUIREMENTS

1. A written incident notification addressing the requirements set out below must be submitted to the Planning Secretary via the Major Projects website within seven days after the Applicant becomes aware of an incident. Notification is required to be given under this condition even if the Applicant fails to give the notification required under Condition C8 or, having given such notification, subsequently forms the view that an incident has not occurred.
2. 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
   h. identify a project contact for further communication regarding the incident.
3. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, the Applicant must provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.
4. 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.

APPENDIX M: GEOTECHNICAL REPORT

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Geotechnical Assessment

Data Centre SSD-10330
17 Roberts Road, Eastern Creek

Prepared for
Canberra Data Centres Pty Ltd

Project 86850.00
October 2019

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	86850.00	Document No.	R.001.Rev1
Document title	Report on Geotechnical Assessment Data Centre SSD-10330		
Site address	17 Roberts Road, Eastern Creek		
Report prepared for	Canberra Data Centres Pty Ltd		
File name	86850.00.R.001.Rev1		

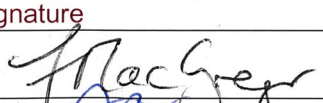
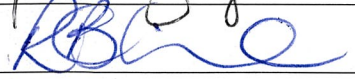
Document status and review

Status	Prepared by	Reviewed by	Date issued
Draft A	Fiona MacGregor	Ray Blinman	18 September 2019
Rev0	Fiona MacGregor	Ray Blinman	21 October 2019
Rev1	Fiona MacGregor	Ray Blinman	23 October 2019

Distribution of copies

Status	Electronic	Paper	Issued to
Draft A	1	0	Anna Wang, Urbis Pty Ltd
Rev 0	1	0	Anna Wang, Urbis Pty Ltd
Rev 1	1	0	Anna Wang, Urbis Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		23 October 2019
Reviewer		23 October 2019

bsi. ISO 9001 Quality Management
FS 604853

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Table of Contents

Page

Report on Geotechnical Assessment
Data Centre SSD-10330
17 Roberts Road, Eastern Creek

1. Introduction

Douglas Partners Pty Ltd (DP) has been commissioned by Canberra Data Centres Pty Ltd (the applicant) to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the SSD-10330 for the development of a Data Centre at 17 Roberts Road, Eastern Creek within the Western Sydney Employment Area (WSEA).

This report presents a geotechnical assessment which was commissioned in a letter dated 28 June 2019 from Urbis, on behalf of Canberra Data Centres Pty Ltd, and was undertaken in accordance with Douglas Partners' proposal SYD190584 dated 7 June 2019.

The geotechnical assessment comprised a review of the available information and an assessment of the subsurface soil and groundwater conditions across the site in order to provide geotechnical advice on:

- Interpreted subsurface conditions, with specific consideration to rock depths and the relevance of variable filling depths across the site;
- Potential for groundwater and variations in groundwater levels across the site;
- Temporary and permanent support measures for retaining walls, temporary or long-term batter slopes, and retaining wall design parameters;
- Site preparation measures for earthworks and pavement subgrades;
- The suitability of the existing materials on the site for beneficial re-use as filling;
- Suitable foundation types as appropriate for each area of the site;
- Foundation design parameters, including bearing pressures;
- Total and differential settlement range estimates, including their effects across the site given the variable underlying ground conditions;
- Pavement design parameters; and
- Additional geotechnical investigations required.

A separate Preliminary Site Investigation (PSI, for contamination) has been prepared for the site based on a review of site information and the site history. This contamination assessment is presented in Report 86850.00.R.002.Rev0.

2. Site Description

The site is located at 17 Roberts Road, Eastern Creek and comprises land known as Lot 2 in Deposited Plan 1159804. The site is identified in Figure 1.

Figure 1: Location of Site

Key features of the site are as follows:

- The site is approximately 14.52 ha and is an irregular shape. The site is bound by Roberts Road to the south and Capicure Drive to the north (refer to Figure 1).
- The site is located within the suburb of Eastern Creek, which falls within the Blacktown Local Government Area. The site is located within the Eastern Creek Precinct of WSEA and is surrounded by general and light industrial land uses.
- The majority of the site is cleared with scattered vegetation around the periphery of the site.
- Vehicular access to the site is from the local road network available from Roberts Road and Capicure Drive. New internal roads will be established as part of the SSDA for internal connection and vehicular access.

Key development features of the site are as follows:

- An existing Data Centre with associated office building and plant is located to the east of the site. This Data Centre is to be retained and does not form part of this SSDA.
- Building 3 is currently under construction under a series of Complying Development Certificates. These comprise of Early Works, Base Build, Fit Out and installation of 12 generators. These works do not form part of the SSDA scope. Additional rooftop plant and equipment for Building 3 forms part of the proposed SSDA scope.

Key features of the locality are:

North: The adjoining land to the north comprises large-scale warehouses, freight, logistics and light industrial activities with ancillary offices, all forming part of the Eastern Creek Business Park.

East: To the east is a parcel of vacant land and landscaped buffer between the light industry use land on the western side of M7 Motorway. Western Sydney Park Land and SUEX Eastern Creek Resource Recovery Park is further to the east of the site, located on the eastern side of M7 Motorway.

South: Land immediately to the south is part of the TransGrid Eastern Creek site, which contains multiple high voltage transmission lines. Austral Bricks is located further south.

West: The land to the west of Roberts Road is Australian Personnel Solutions National Service Centre. Further to the west is Old Wallgrove Road and TransGrid Eastern Creek site, containing high voltage transmission lines and substations.

The nearest residential receivers are located in Horsley Park located around 1 km to the south of the site. Other nearby residential areas include Minchinbury to the north of the site, beyond the M4 (approx. 4 km from the site); and Erskine Park to the west (approx. 2.8 km from the site).

3. Regional Geology

Reference to the Penrith 1:100 000 Geological Series Sheet indicates that the site is underlain by Bringelly Shale which is part of the Wianamatta Group of Triassic age.

The Bringelly Shale comprises an interbedded sequence of shale, claystone, carbonaceous claystone, laminite, siltstone, fine grained lithic sandstone and occasional rare coal seams. These rock units typically weather to form clays which are moderately to highly reactive.

4. Available Information

The following documents were reviewed by DP as part of this assessment, together with published regional maps.

- Connell Wagner (2003) – ‘Extraction and Rehabilitation Plan – Vineyard Property – Wallgrove Road, Horsley Park', prepared for Austral Bricks, Reference 1149/01, 28 August 2003.
- Jeffery and Katauskas Pty Ltd (2010) – 'Geotechnical Investigation for Proposed EC Data Centre at M7 Business Hub, Capicure Drive (corner Roberts Road), Eastern Creek, NSW', prepared for

CB Richard Ellis P/L, Goodman Vineyard P/L and Austral Brick Company P/L, Reference 24308LBrpt, 5 October 2010.

- Numerous letters and reports prepared by DP for the Austral Brick Company Pty Ltd (Austral Bricks) over the period from 2005 to 2011.
- Fortify Geotech (2018) – 'Geotechnical Investigation Report: Proposed Data Centre – Roberts Road, Eastern Creek, NSW', Reference AB/C7483, 21 September 2018.

5. Summary of Available Geotechnical Information

General

The site was used by Austral Bricks for extraction of clays and shale for brick and tile manufacturing. Two pits were excavated on the site for this purpose. The first (Vineyard Pit 1) was located over the eastern half of the site, while the second (Vineyard Pit 2) was located in the south-western part of the site. The locations of the former pits are shown on the attached Drawing No. 1, relative to the proposed development.

Connell Wagner (2003)

Connell Wagner reported that approval for clay/shale extraction was granted for the site in December 1986. They suggested that the site was likely to reach the end of its economic lifespan by 2008 as the resources on the site were substantially poorer than originally predicted. Connell Wagner described the existing main pit (Vineyard Pit 1) in 2003 as having a base level of about RL 40 m, with battered sides at 10-15 degrees in upper soils then 25-60 degrees in the underlying shale and sandstone. Erosion of soils and fretting and undercutting of sandstone was observed in some areas. No groundwater was observed above the base of the pit.

Connell Wagner reported that extraction from a second pit (Vineyard Pit 2) was to be undertaken as the main pit was filled with VENM, with approximately 1.3 million m^3 of fill required for Pit 1. Connell Wagner predicted that the Pit 2 extraction would be about 600,000 m^3.

Backfilling of Vineyard Pit 1

In 2005 DP was engaged by Austral Bricks to prepare an earthworks specification for back filling of Vineyard Pit 1 and to provide Level 1 supervision of the compaction of the filling. In addition, DP inspected and environmentally approved each of the source sites that supplied VENM to Pit 1.

Backfilling of Pit 1 occurred in the period from 27 April 2005 to 5 February 2009. The quarry was an essentially square pit with approximate base dimensions of 200 m by 200 m.

A survey plan (Ref. No. 110595024 Rev 00, prepared by Hard & Forester Pty Ltd, dated 2 September 2004) showed quarry floor levels at the time of commencement of backfilling were typically at about RL 30 m to RL 35 m, with some higher areas where there were stockpiles of loose soil and rock, or where the formation of sedimentation ponds had otherwise limited the pit excavation depth. The ground levels surrounding the pit ranged from about RL 60 m along the southern side of the pit to about RL 75 m along the northern side of the pit – resulting in a pit depth of about 30-40 m. A photograph of Pit 1 in July 2005 is given in Figure 2.

Figure 2: Panoramic View of Pit 1 in July 2005

The works undertaken and supervised by DP included:

- Initial site inspection and preparation of project documentation including:
  - Earthworks Specification;
  - Environmental Pit Infill Control Plan; and
  - Specifications for pit floor preparations prior to commencement of filling.
- Stripping of all loose quarry materials, stockpiles and surface sediments from the pit floor to expose the underlying in-situ rock base.
- Pumping out of all waters within sediment ponds at various levels across the pit.
- Removal of deep sediments (typically about 2 m) from all ponds to stockpiles located outside of the pit.
- Backfilling of all lower level sediment ponds and localised quarry floor sumps with imported or on-site available ripped sandstone.
- Backfilling of all lower pit floor levels with high granular content ripped siltstone, sandstone and shale filling.
- Over-excavation of the upper 5 m to 8 m of the pit sides on the southern, eastern and western sides to form a bench to improve the 'keying-in' of the new filling with the in-situ materials exposed in the pit sides.
- Progressive stripping of all perimeter batters to remove all loose, weathered scree material.
- Backfilling of the pit with excess soil and rock materials sourced as VENM from various Goodman sites located to north of the pit (Coles Myer, Toll, Capicure Drive, etc).
- Backfilling of the pit with predominantly granular filling, supplied as VENM from many external source sites located across the greater Sydney metropolitan area.
- Compaction of all filling in accordance with the earthworks specification, achieving a minimum compaction value of 98% relative to standard density, although often greater than 100%.

The filling included a wide variety of materials including various blends of gravel, sand, silt and clay soils. It is best described as consisting of ripped sandstone, ripped shale and gravelly clay.

The filling was placed by end tipping from delivery trucks in a long working face perpendicular to the rolling operation, whereby all materials were then spread and mixed together using the blade of the 825 compactors to form a hybrid granular filling mix. Generally, the maximum particle size of the filling was restricted wherever possible to 300 mm, following compaction. The filling was placed in layer

thicknesses of between 100 mm and 500 mm in a continuous operation across each filling area. Approximately 1.8 million m^3 of fill was placed within Pit 1.

Testing occurred at random locations on each layer of filling. During placement of filling the contractor was advised of the test results both in terms of density and moisture content. When density was low, additional rolling of the filling was undertaken. When filling was too dry or too wet, the contractor was informed and advised to adjust filling moistures accordingly, which at times, included the removal and replacement of the non-conforming filling layer.

In undertaking the above works, DP inspected and environmentally approved each of the source sites that supplied VENM to Vineyard Pit 1. All filling placed and compacted in Vineyard Pit 1 was subjected to a program of engineering inspections and compaction testing in accordance with the Level 1 requirements of AS3798-2007.

Figure 3: Backfilling of Pit 1 in May 2006

The eastern side of the pit was filled to about RL 61 m AHD, while the western side was filled to about RL 67 m AHD, with a sloping batter between these two areas.

The typical filling depths in Pit 1 ranged between approximately 29 m and 36 m for areas overlying the main, central quarry floor. However, for areas around the edge of the former quarry the total filling depths vary between zero and approximately 35 m.

Figure 4: View of Pit 1 after completion of back filling – looking south east

Settlement Monitoring of Filling in Pit 1

After completion of the filling on the eastern half of Pit 1, settlement plates MP1 to MP5 were installed to monitor settlements with time. Monitoring of these plates commenced on 6 January 2009 and was continued to 16 August 2010, giving 22.5 months of survey measurement.

Settlement plates MP6 to MP9 were positioned after filling was completed in the western half of the pit. Monitoring of these plates commenced on 2 September 2009 and was continued to 16 August 2010, giving 14 months of survey measurement.

The thicknesses of the filling beneath the settlement monitoring plates varied and some settlement plates were located close to the former pit walls.

Backfilling of Vineyard Pit 2

Austral Bricks engaged DP to provide advice and supervision of the backfilling of Vineyard Pit No.2.

Backfilling of the pit occurred between February 2009 and May 2011. Pit 2 is essentially a rectangular shape with approximate base dimensions of 150 m by 70 m.

A survey plan prepared by Hard & Forester Pty Ltd, the project surveyors, showed the layout and ground surface contours for the pit prior to commencement of the backfilling works. In general, at the time of commencement of backfilling, the pit floor varied in level between reduced levels of

approximately RL 48 m and RL 53.5 m AHD, with a fall of approximately 5.5 m from west to east for drainage during excavation. Removal of existing sumps and soft sediments prior to placement of filling resulted in limited and localised areas of additional excavation of up to 1.5 m.

Figure 5: View of Pit 2 in October 2008 prior to backfilling

In early 2009, Mulgoa Quarries Pty Ltd (the earthworks contractor for the project) scraped clean the sides of the pit, thus removing all loose scree. Backfilling of the lower part of the pit commenced following the site preparations works, with approximately 32,000 m^3 of backfilling placed before the project works were temporarily ceased. On recommencement of the project Ward Civil and Environmental Engineering Pty Ltd (Ward) continued the backfilling process until project completion in May 2011.

The scope of the work undertaken by DP included preparation of an earthworks specification for the backfilling of Pit 2, supervision of stripping and proof rolling, routine engineering inspections during the backfilling works, and density and materials testing in general accordance with a Level 1 standard, as defined in AS3798-2007 Guidelines on Earthworks for Commercial and Residential Developments.

The upper 2 m to 3 m of the northern, eastern and western pit sides were over-excavated forming a bench in the filling profile. This bench was included into the works to improve the 'keying-in' of the new filling with the in-situ materials exposed in the pit sides.

Filling materials were won from on-site excavations at the pit perimeter and from a large on site excavation to the immediate north of the pit. In total approximately 169,000 m^3 of filling was sourced from new construction works undertaken within the former Austral site, representing about 63% of the total filling volume.

In addition, filling was sourced from ten external source sites located across the greater Sydney area. Filling was imported under project-specific geotechnical and environmental protocols, with each proposed source site subjected to individual assessment prior to being approved for delivery to Vineyard Pit No.2.

The filling included a wide variety of materials including various blends of gravel, sand, silt and clay soils. The filling is best described as consisting of ripped and crushed sandstone, ripped shale and gravelly clay. All filling imported to site was placed by end tipping from delivery trucks in a long working face perpendicular to the rolling operation, whereby all materials were then spread and mixed together using the blade of the 825 compactors to form a hybrid granular filling mix. Generally, the maximum particle size of the filling was restricted wherever possible to 250 mm, following compaction.

Filling was placed by scrapers and dump trucks and was compacted using compactors and self-propelled rollers. The filling was placed in layer thicknesses of between 100 mm and 500 mm by scrapers and dump trucks in a continuous operation across each filling area. Testing occurred at random locations on each layer of filling.

Figure 6: Filling of Pit 2 in September 2010

During placement of filling the contractor was advised of the test results both in terms of density and moisture content. When density was low, additional rolling of the filling was undertaken. When filling was too dry or too wet, the contractor was informed and advised to adjust filling moistures accordingly, which at times, included the removal and replacement of the non-conforming filling layer.

The finished ground surfaces across the top of the backfilled pit ranged from RL 72 m in the west to RL 68 m in the east, resulting in fill thicknesses of about 18 m to 21 m in the pit area.

Figure 7: Pit 2 area in June 2011 after completion of backfilling

Jeffery and Katauskas (2010)

Jeffery and Katauskas undertook a geotechnical investigation in October 2010 for a data centre building which has been constructed on the eastern half of the site (Existing Data Hall Building 1 – refer Figure 8) in the area of the backfilled Pit 1. They drilled eight boreholes and collected eight bulk samples from the ground surface in September 2010. The boreholes were drilled to depths of 15 m to 42 m, with coring of the bedrock. The recovered cored bedrock was of variable strength and weathering, mostly becoming low and medium strength with depth, but with some higher and lower strength bands.

Fortify Geotech (2018)

In August 2018 Fortify undertook geotechnical investigations for the proposed new buildings over the western half of the site. The investigations included nine boreholes drilled to depths between 4 m and 24 m. Little data was collected on the overburden soils, but all bores were cored, typically about 3 m

into rock. The depth to rock ranged from 1.2 m to 21.6 m. The bedrock intersected by the boreholes was variably weathered and the logged strengths ranged from weak to extremely strong.

6. Proposed Development

The SSDA proposes the construction of a new Data Centre and ancillary office space to expand the operation of the existing Data Centre to the east of the site. The proposed Data Centre includes three large warehouse buildings and ancillary office space, which will deliver economic benefits and employment generation for Western Sydney and the Greater Sydney Region. The proposed new buildings are shown on Figure 8.

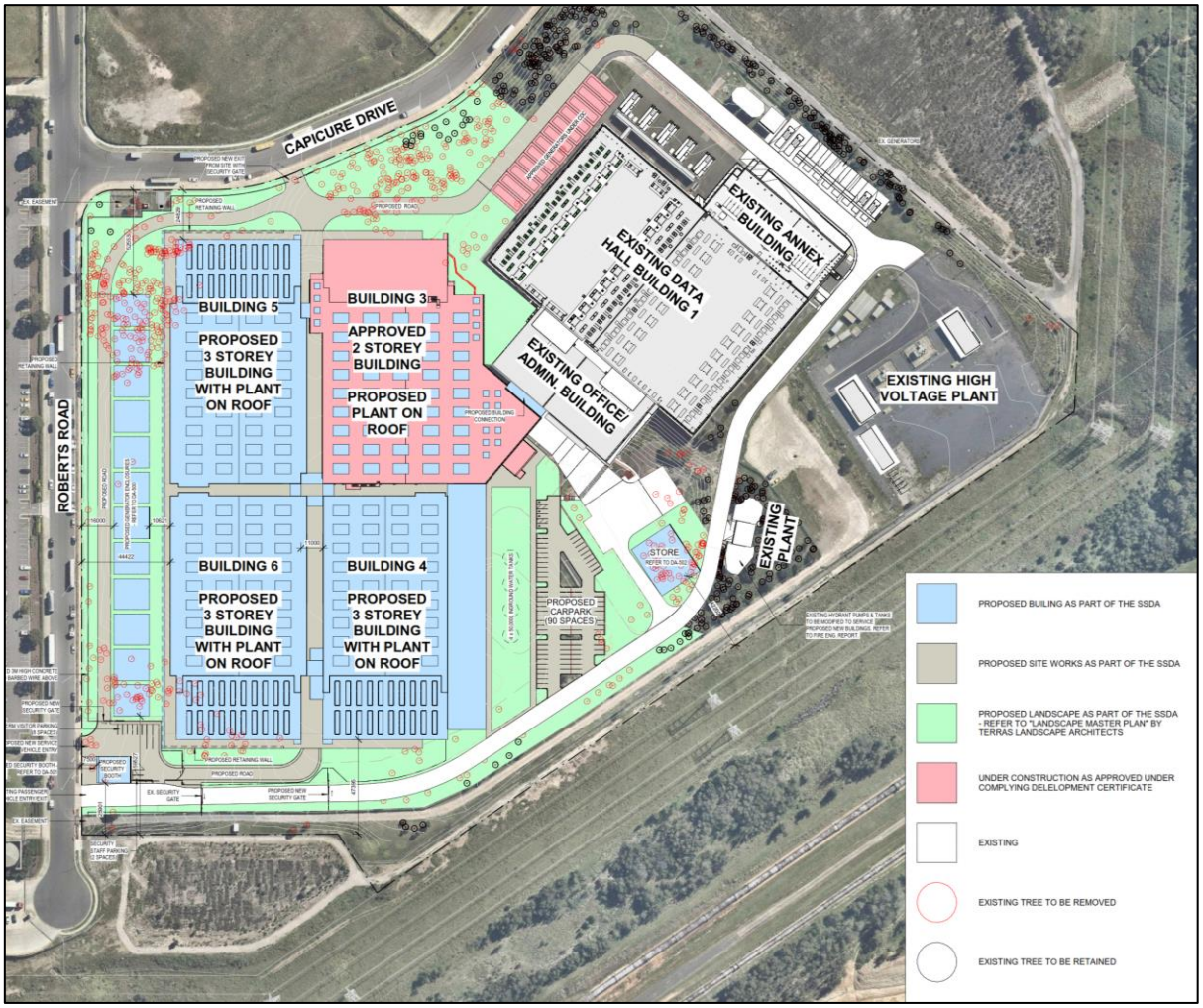


Figure 8: Proposed Development

Specifically, the SSDA seeks consent for:

- Site preparation works comprising:
  - Site preparation and mobilisation, including clearing of land and importation of fill material;
  - Bulk and detail earthworks and support structures;

- Estate stormwater management, including construction of detention basins;
- Construction of site access and estate internal roads;
- Service and infrastructure augmentation;
- Perimeter fencing;
- Retaining wall;
- Removal of trees, and
- Environmental protection and management measures.

- Staged construction of buildings for a Data Centre with 24 hour/day, seven day/week operation:
  - Construction of three 3 storey warehouse facilities (E4, E5, E6), including ancillary office spaces;
  - Additional rooftop plant and equipment for Building 3 in association with Data Centre use;
  - Fit out of buildings;
  - Construction of plant rooms and a store room;
  - Security booth;
  - Generators within generator enclosures;
  - Landscaping works; and
  - Construction of hardstand and a new car park.

The proposal does not involve the installation of any form of signage to the façade of the building.

7. Interpreted Geological Model

The site has been extensively altered by quarrying and earthmoving activities which have occurred since about 1986.

The original ground profile would have comprised residual clays and silty clays to depths of 5-7 m, overlying weathered shales, siltstones, claystones and sandstones. The bedrock in the area is typically initially extremely weathered to highly weathered, becoming less weathered and stronger with depth.

Some of the original soil and rock profile remains in place, but the areas of the two former pits have been excavated and backfilled to average depths of 35 m (Pit 1) and 20 m (Pit 2). In addition, other earthworks (both excavation and filling) have been undertaken on the site to form level building platforms, resulting in bedrock being at varying depths on different parts of the site.

8. Comments

8.1 Main Geotechnical Features of the Site

The backfilling of the two pits was undertaken in a controlled manner under the close supervision of DP to ensure that the materials used were suitable and were adequately compacted. Despite this

there are still significant differences between the thicknesses of filling in different parts of the site which may cause differential settlement across buildings. The detailed design of foundation systems needs to be based on the locations of the buildings relative to the previous pits and other earthworks. The locations of the proposed buildings are shown on the attached Drawing 1, over the outlines of the backfilled pits.

During development and construction of new structures at this site due consideration should be given to:

- Variation in filling depths across building footprints;
- Potential for long term creep settlement of the filling;
- Possible disruption of the compacted filling by installation of services or other earthworks activities;
- The possibility that additional filling has been placed after DP's supervision was completed; and
- The reactivity of the natural clays for shallow footings founded on these materials.

8.2 Groundwater

The original groundwater level at the site is likely to have been impacted by the quarrying and then backfilling of the pits. There was very little seepage observed in either of the pits during excavation which suggests that the groundwater table was below the level of the base of the pits.

Since backfilling of the site, it is possible that the former pits have provided local areas for collection of seepage resulting in some locally perched water, but any such water is likely to be many metres below the building levels and thus the construction of the development is unlikely to affect groundwater.

8.3 Excavations

Excavations for the proposed development may be through compacted filling, residual clays and weathered rock.

Excavations within filling and residual soil will require the use of medium sized excavators, dozers and/or scrapers for efficient excavation. The underlying weathered rock will require larger excavators and dozers with extensive ripping and use of large sized hydraulic hammers. Detailed rock excavations and/or excavations near vibration sensitive structures or services, may require the use of rock grinders and/or saws to minimise vibratory effects.

Where there is sufficient space available the following maximum batter slopes may be adopted. Any permanent batters will require protection against erosion and local slumping and DP recommends that flatter batters be used where vegetation cover is proposed.

If surcharge loads are applied near the crest of the slope, then further specific geotechnical review and probably flatter batters or stabilisation may be required.

Table 1: Recommended Maximum Batter Slopes

Material	Maximum Temporary Batter Slope (H : V)		Maximum Permanent Batter Slope # (H : V)
	Height < 4 m	Height > 4 m	
Filling	1 : 1	1.5 : 1	2 : 1
Residual clays	1 : 1	1.5 : 1	2 : 1
Weathered Rock	0.75 : 1	1 : 1	1.5 : 1

Note: # Permanent batters should be flattened to encourage growth of vegetation and reduce erosion.

Where retaining walls are proposed, it is suggested that design of cantilevered shoring systems (or shoring with one row of anchors or propping) may be based on a triangular earth pressure distribution using the earth pressure coefficients provided in Table 2.

'Active' earth pressure coefficient (K_a) values may be used where some wall movement is acceptable, and 'at rest' earth pressure (K_0) values should be used where the wall movement needs to be reduced (i.e. adjacent to existing structures or utilities).

Table 2: Recommended Design Parameters for Retaining Walls

Material	Unit Weight (kN/m^3)	Earth Pressure Coefficient		Effective Cohesion c' (kPa)	Effective Friction Angle (Degrees)
		Active (K_a)	At Rest (K_o)		
Filling	20	0.25	0.3	5	30
Residual clays	20	0.25	0.3	10	25
Weathered Rock	22	0.2	0.25	15	30

The design of the retaining walls should allow for all surcharge loads, including building footings, inclined slopes behind the wall, and construction related activities. In addition consideration should be given to potential differential settlements along the line of the retaining walls due to variable thicknesses of underlying filling. Where possible, it is recommended that flexible types of retaining walls are used.

8.4 Site Preparation

The site preparation works should include regrading of the site surface to design finished surface levels, capping the ground surface with an improved CBR value select filling layer (as required) and placement of a minimum 150 mm thickness of DGS20 (or similar) road base to act as a working platform and subbase layer for proposed floor slabs.

All earthworks should be undertaken in a controlled manner and should be subjected to a Level 1 standard of geotechnical inspection and testing, as defined in AS3798-2007 Guidelines on Earthworks for Commercial and Residential Developments.

As part of the earthworks programme, it is recommended that the upper 0.5 m of existing filling beneath buildings should be stripped of vegetation and reworked in a controlled manner to correct any lost compaction and/or moisture, as a result of being exposed for several years.

The materials which were imported to site as part of the supervised backfilling of the pits and the natural clay soils and weathered rock on the site are generally suitable for reuse as engineered filling. The natural soils and rock on the site contain expansive clay minerals and are generally considered to be moderately to highly reactive, accordingly it is important to ensure that the materials are placed and compacted slightly wet of the optimum moisture content and are not over compacted.

8.5 Foundations and Settlement

8.5.1 Foundation Types

The two categories of foundation system which can be considered for support of structures on this site are:

- high level foundations comprising stiffened raft slabs or pad and strip footings; or
- deep piles that found on the underlying in-situ rock below the quarry backfilling.

If adopted, high level footings would need to account for the expected total and differential settlements that will result from both imposed loading and ongoing creep settlement of the filling. Provided the proposed structures are sited over near-uniform filling depths, the magnitude of these settlements might be acceptable from a design viewpoint, depending upon the structure's sensitivity to total and differential settlement and the building design requirements.

Alternatively, deep piles founded in rock will reduce the effects of settlement on the structural elements supported on the piled footings, although floor slabs and surrounding pavements will remain subject to the influence of settlement unless they too are fully suspended on piles.

When selecting the most appropriate foundation system, the serviceability requirements of the structure should be considered. This issue will probably be the main one determining the appropriate foundation system. If a super flat floor is part of the design criteria then the building and the floor slabs should probably be supported on piles.

Based on the original base levels of the pits and with reference to the location of the proposed new buildings relative to the pits as shown on Drawing 1, it is estimated that the thickness of filling beneath each of the proposed new buildings is as follows:

- Building 4 – up to 20 m thick over the southern third and less than 1-2 m over the northern third;
- Building 5 – up to 5-15 m thick under the northern quarter and less than 1-2 m over the rest of the building; and
- Building 6 – up to 20 m in the south-eastern corner and less than 1-2 m elsewhere.

Based on these estimates bored pile depths are expected to be in the order of 25 m, allowing about 5m for pile socket lengths in reasonable quality bedrock.

For design of shallow footings shrink-swell movements of the clay need to be properly considered. Even if the estimated total and differential settlements are acceptable, the floor slab of the buildings may undergo unacceptable movements due to variations in moisture content in the clay at the time of construction and over the building life. Of particular importance will be the moisture condition of the filling immediately before the floor slab is poured. If construction takes place in summer, the clay soils may be seriously desiccated and will therefore have a high potential for serious swelling.

8.5.2 Settlement

As part of this assessment DP has reviewed the previous data collected from settlement plates monitored over the backfilled Pit 1 for about 2 years in 2009 and 2010. In addition DP understands that the ground slabs in the existing data centre building over Pit 1 had settled by about 90 mm as of mid-2019.

There are several types and causes of settlements within deep filling however, those relevant to this project are listed below:

- **Short-term (Primary) Settlement** – this settlement occurs due to the self-weight of each additional filling layer as it is placed on top of the previous layer. Short-term or primary settlement occurs during the filling process and continues for a short period after placement of the final filling layer. As the site comprises controlled filling that has a typical compacted dry density ratio of greater than 100% relative to standard compaction, has a moisture content close to standard optimum and is generally unaffected by groundwater, it is likely that primary settlement of the backfilled pits is now complete.
- **Elastic Settlement** – this occurs when the surface of the filling is subjected to additional surcharge loads such as building loads, pavements or similar. This settlement is experienced mainly by the upper portion of the filling, will occur as the loads are applied, and is relatively minor by comparison to creep settlement.
- **Long-term (Creep) Settlement** – this settlement occurs due to the constant high stress condition induced by the upper layers of filling on the lower layers. Settlements occur as the soil particles within the filling gradually realign following failure of the contact points between particles. The magnitude of settlement is directly related to the compacted density ratio of the filling, hence good compaction results in lower creep settlements. Creep settlements will continue for many years after completion of the filling and thus is a major component of long-term total settlements following site development.

At this point, given that about 8-10 years have elapsed since the pits were backfilled, DP considers it likely that the majority of ongoing settlements will be due to gradual creep settlement. This type of settlement gradually reduces with time, but can continue for many years. As the type of filling, its nominal size, degree of compaction, moisture content and overlying surcharge load all affect settlement, predicting the final settlement value can be very difficult.
DP's analysis of the available data from the settlement monitoring and subsequent reported settlements, suggests that the creep settlement rate at the site due to the compacted fill ranges from about 0.15% to 0.6% of the fill thickness per log cycle of time to 0.6%. The average rate is estimated to be about 0.4%.

Applying these ranges of creep settlement rates to the maximum fill thickness expected under the new buildings (i.e. about 20 m), then DP estimates that there could be 50-80 mm of creep settlement over the area of deepest fill in the next 40 years.

At any given specific surface location, however, the total settlement estimate would need to be increased by the elastic settlement due to imposed loadings on the surface. This latter category of loading would essentially be 'one-off', but would nonetheless be experienced by the structure.

The total settlements expected are greater than what is normally acceptable for commercial buildings. Predicting differential settlements across the site will be essentially approximate. Unacceptable uncertainty about building settlement could be resolved by the use of piles.

8.5.3 Foundation Design Parameters

For high level pad and strip footings, DP recommends an allowable design bearing pressure of 150 kPa on either the natural clay soils or the compacted filling.

Design of rafts or slabs may be initially based on a subgrade elastic modulus (E) of 15 MPa. If such slabs are designed to span areas with significantly different thickness of soils or fill above rock then a detailed analysis of the settlement of the slab under the specific loads will be required.

To provide specific piled footing design parameters it is suggested that additional subsurface investigations be undertaken which include the drilling of cored boreholes at the heavily loaded pile locations to depths of at least 10 m into the underlying rock, to confirm the strength of the rock. Such investigations will allow optimisation of the pile design and therefore should be undertaken prior to completion of the structural design (and prior to construction). Alternatively the designs may be undertaken using the relatively conservative values given in Table 3. For bored piles, if required, shaft adhesion values for uplift (tension) may be taken as being equal to 70% of the shaft adhesion values for compression in Table 3.

Table 3: Preliminary Design Parameters for Bored Piles

Foundation Stratum	Maximum Allowable Pressure (Serviceability)		Maximum Ultimate Pressure (Ultimate)		Young's Modulus E (MPa)
	End Bearing (kPa)	Shaft Adhesion (Compression) (kPa)	End Bearing (kPa)	Shaft Adhesion (Compression) (kPa)	
VL-L Shale	1,000	100	3,000	150	100

All footing excavations should be inspected by a geotechnical engineer during construction to confirm that foundation conditions are suitable for the design parameters.

8.6 Pavements

Due to the likely variable subgrade conditions comprising natural clays and fill for many different locations, DP suggests that preliminary design of new pavements within the site should be based on an average California bearing ratio (CBR) value of 3.0% for the subgrade.

Surface and subsurface drainage will be required to reduce the amount of moisture penetrating the subgrade and pavement.

8.7 Additional Geotechnical Investigations

Once the detailed design of the proposed buildings is commenced, then DP recommends that additional investigations are undertaken, which include the drilling of specifically located (i.e. targeted) cored bores to confirm the rock depth and strength for locations where bored piles are proposed. These investigations should be undertaken prior to completion of the structural design.

9. Glossary and Abbreviations

Glossary

Term	Definition
The Site	Canberra Data Centres Pty Ltd owns the site at 17 Roberts Road, Eastern Creek and is legally known as Lot 2 in Deposited Plan 1159804.
The Project	The construction of a new Data Centre and ancillary office space to expand the operation of the existing Data Centre to the east of the site (Data Halls/Buildings 4 to 6).

Abbreviations

Acronym	Definition
AHD	Australian Height Datum
Austral Bricks	The Austral Brick Company Pty Ltd
DP	Douglas Partners Pty Ltd
Ha	Hectare
NSW	New South Wales
SSDA	State Significant Development Application

10. References

1. Australian Standard AS2870-2011, 'Residential Slabs and Footings', April 2011, Standards Australia

2. Australian Standard AS3798-2007, 'Guidelines on Earthworks for Commercial and Residential Developments', March 2007, Standards Australia

11. Limitations

Douglas Partners (DP) has prepared this report for this project at 17 Roberts Road, Eastern Creek in accordance with DP's proposal dated 17 June 2019 and acceptance received from Urbis dated 28 June 2019. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Canberra Data Centres Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

DP's advice is based upon the conditions observed by DP during backfilling of the old quarry pits and review of investigations undertaken by others. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the geotechnical components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

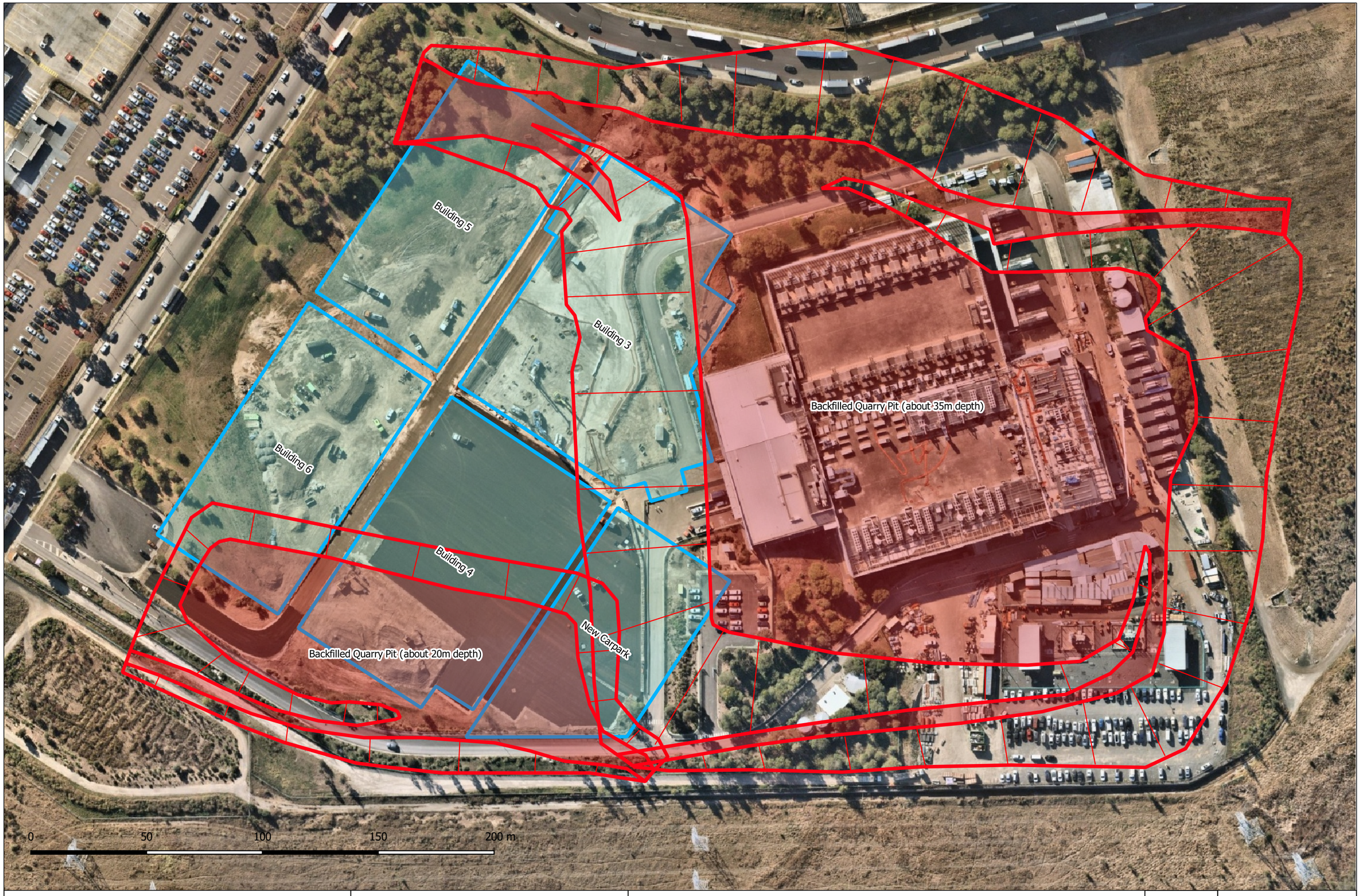
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Drawing 1



Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Canberra Data Centers Pty Ltd		
OFFICE:	Sydney	DRAWN BY:	AP
SCALE:	1:1,500 @ A3	DATE:	12/09/2019

TITLE: **Proposed Warehouse and Distribution Centre**
Proposed Building Outlines and Existing Quarry Locations
17 Roberts Road, Eastern Creek

N

PROJECT No:	86850.00
DRAWING No:	1
REVISION:	0

APPENDIX N: CONSTRUCTION TRAFFIC MANAGEMENT PLAN

Construction Traffic Management Plan

17 Roberts Road, Eastern Creek

Ref: 1027r02v7
24/09/2020

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Document Control

Project No: 1027

Project: 17 Roberts Road, Eastern Creek

Client: Canberra Data Centres

File Reference: 1027r02v7 CTMP 17 Roberts Road, Eastern Creek, Issue VII

Revision History

Revision	Date	Details	Author	Approved by
-	3/09/2019	Draft	V. Cheng & J. Mulhaire	R.B Madden
I	31/10/2019	Issue I	V. Cheng	R.B Madden
II	11/11/2019	Issue II	A. Tan	R.B Madden
III	20/08/2020	Issue III	A. Tan	R.B Madden
IIII	11/09/2020	Issue IIII	A. Tan / M. Tran	R.B Madden
V	17/09/2020	Issue V	A. Tan / M. Tran	R.B Madden
VI	22/09/2020	Issue VI	A. Tan / M. Tran	R.B Madden
VII	24/09/2020	Issue VII	A. Tan / M. Tran	R.B Madden

Table of Contents

1 Introduction

1.1 Overview

Ason Group have been commissioned by Canberra Data Centres Pty Ltd and Hindmarsh (the Proponents) to prepare a Construction Traffic Management Plan (CTMP) in response to the Department of Planning, Industry and Environment (DPIE) Conditions of Consent for an approved data centre (the Proposal) at 17 Roberts Road, Eastern Creek (the Site).

State Significant Development (SSD) 10330 was approved on 9 March 2020, with the Conditions of Consent relevant to this CTMP being:

Condition B22.

Prior to the commencement of construction, the Applicant must update the Construction Traffic Management Plan (CTMP) included in the EIS to the satisfaction of the Planning Secretary. The updated CTMP must form part of the development's Construction Environmental Management Plan (see Condition C2) and must:

(a) Be prepared by a suitably qualified and experienced person(s);
(b) Detail the measures that are to be implemented to ensure road safety and network efficiency during construction
(c) Detail heavy vehicle routes, access and parking arrangements;
(d) Include a Driver Code of Conduct to:
    (i) Minimise the impacts of earthworks and construction on the local and regional road network;
    (ii) Minimise conflicts with other road users;
    (iii) Minimise road traffic noise; and
    (iv) Ensure truck drivers use specified routes;
(e) Include a program to monitor the effectiveness of these measures; and
(f) If necessary, detail procedures for notifying surrounding landowners of any potential disruptions to routes.

Condition B23.

The Applicant must:

(a) *Not commence construction of the development until the updated CTMP required by Condition B22 is approved by the Planning Secretary; and*

(b) *Implement the most recent version of the CTMP approved by the Planning Secretary for the duration of construction.*

Condition C1.

Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:

(a) *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;*

(b) *A description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;*

(c) *A program to monitor and report on the:*

- *(i) impacts and environmental performance of the development; and*
- *(ii) effectiveness of the management measures set out pursuant to Condition C1(b) above;*

(d) *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;*

(e) *A program to investigate and implement ways to improve the environmental performance of the development over time;*

(f) *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*

(g) *A protocol for periodic review of the plan*

Note: The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.

Condition C2.

The Applicant must prepare a Construction Environmental Management Plan (CEMP) in accordance with the requirements of Condition C1 and to the satisfaction of the Planning Secretary.

Condition C3

As part of the CEMP required under Condition C2 of this consent, the Applicant must include the following:

(a) Updated Construction Traffic Management Plan (see Condition B22)

The purpose of the report is to detail a traffic plan for the construction of the approved data centre that seeks to minimise traffic impacts on the surrounding road network; ensure safety and efficiency for workers, pedestrians, other road users; and provide information regarding the construction vehicle access routes and any changed road conditions (if applicable).

1.2 Report Purpose

The purpose of this report is to detail a traffic plan for construction that seeks:

- To minimise traffic impacts on the surrounding road network,
- Ensure safety and efficiency for workers, pedestrians, other road users, and
- Provide information regarding the construction vehicle access routes and any changed road conditions (if applicable).

The methodology contained within this report has been developed on the basis of numerous other CTMPs implemented in the area, including those for development of the Oakdale West and Oakdale South Industrial Estates.

It is expected that this plan will be updated should any necessary changes to the currently proposed arrangements arise in the future. Any special events (if required) would be subject to a separate request for a specific permit not covered by this report.

Ason Group is responsible for the preparation of this Plan only and not for its implementation, which is the responsibility of the Construction Contractor (Hindmarsh).

1.3 Statutory Requirements

A summary of the relevant requirements of the conditions of consent and this CTMPs compliance with each is provided below for clarity.

Table 1: CTMP Compliance Table

Reference	Requirement	Response
B22	Prior to the commencement of construction, the Applicant must update the Construction Traffic Management Plan (CTMP) included in the EIS to the satisfaction of the Planning Secretary. The updated CTMP must form part of the development's Construction Environmental Management Plan (see Condition C2) and must:	This report has been based on the draft CTMP submitted as part of the assessment of SSD-10330 and has been updated to reflect the Conditions of Consent
a	Be prepared by a suitably qualified and experienced person(s)	It is confirmed that Ason Group is suitably qualified to prepare this CTMP. Further, the Traffic Control Plan (TCP) to be implemented throughout the construction phases has been developed by a person licensed with the "Prepare a Work Zone Traffic Management Plan" card, which has been included within the TCP.
b	Detail the measures that are to be implemented to ensure road safety and network efficiency during construction	There are a number of measures including the provision of a Driver Code of Conduct (CoC) (see Section 5) and measures to minimise the impact of traffic associated with construction (see Section 6.5). Furthermore, Traffic Controllers (TC's) shall be utilised, and Traffic Control Plans (TCPs) shall be developed to ensure safe movement of vehicles to / from / within the Site.
c	Detail heavy vehicle routes, access and parking arrangements	**Figure 6** and Section 3.3 outline the construction vehicle routes. A copy is to be provided to all drivers to the Site. A current Site Plan is provided as **Figure 7**, detailing the current parking arrangements. This will be updated as construction on the Site progresses for each of the respective buildings.
d	Include a Driver Code of Conduct to:	See Section 5

(i)	Minimise the impacts of earthworks and construction on the local and regional road network	As per the CoC, all loads are to be covered, no queuing will be permitted on local roads and drivers must use local roads as little as possible, taking the shortest possible route to the arterial road network. As per the CoC, all drivers must obey weight, length and height restrictions imposed by the National Heavy Vehicle Regulator (NHVR), and other Government agencies. Further, as per this CTMP, two-way radios will be used to communicate to coordinate heavy vehicle arrivals.
(ii)	Minimise conflicts with other road users	As per the CoC, all drivers must adhere to all applicable road rules and comply with all traffic and road legislation when driving, which will ensure the safety of other road users. As noted, drivers are use local roads only when required to access the arterial network.
(iii)	Minimise road traffic noise; and	As per the CoC, drivers must Be cognisant of the noise requirements imposed within the NSW / Australian Road Rules. Drivers must drive in a manner to reduce noise, such as limiting compression braking, and adhering to items within the Road Rules, such as driving a vehicle in a way that makes unnecessary noise or smoke.
(iv)	Ensure truck drivers use specified routes	Routes are detailed in Figure 6 and Section 3.2.3 and the CoC requires them to be adhered to.
e	Include a program to monitor the effectiveness of these measures; and	The Contractor will implement a program to monitor the effectiveness of the measures contained within the CTMP (Section 4), with monitoring to occur at least on a monthly basis. With regard to construction traffic, deliveries will be tracked against approved volumes and a vehicle log will be kept - including rego & time of entry - for the purpose of assessing the effectiveness of this CTMP. A contingency program is to be implemented to support the ongoing monitoring, which will identify whether the measures contained within this CTMP are remaining effective. These programs will be completed by the Contractor in accordance with Section 7.

f	If necessary, detail procedures for notifying surrounding landowners of any potential disruptions to routes.	Section 7.3 outlines the required approach to a Communications Strategy, which will be the responsibility of the Contractor to develop and implement. These programs will be completed in accordance with Section 7.
B23	The Applicant must:	N/A
a	Not commence construction of the development until the updated CTMP required by Condition B22 is approved by the Planning Secretary; and	Noted. This document presents the most recent version of the CTMP and is to be implemented by the Contractor once approval from the Planning Secretary has been provided.
b	Implement the most recent version of the CTMP approved by the Planning Secretary for the duration of construction.	Noted. It is expected that this plan would be updated should any necessary changes to the currently proposed arrangements arise in the future. Any changes to this plan shall be done in consultation with and approved by the Planning Secretary.
C1	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	N/A
a	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	All requirements relevant to this project are outlined in this table / in this CTMP. No further approvals are needed for the traffic management measures detailed in this CTMP. Other approvals / procedures that are not specified within this CTMP, will need to be subject to a separate application process. Other specific requirements and performance indicators are detailed in Sections 4 and 7.
b	A description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria	Section 4 details the proposed management for construction traffic.

c	A program to monitor and report on the: (i) impacts and environmental performance of the development; and (ii) effectiveness of the management measures set out pursuant to Condition C1(b) above	As above, it will be the Contractor's responsibility to implement a monitoring program to ensure the effectiveness of the measures contained within the CTMP is maintained, which must be completed in accordance with Section 7. This is approach is entirely consistent with CTMPs implemented for other SSDs in the area and the construction activities currently taking place on the Site. Further, a contingency program is to be implemented to support the ongoing monitoring, which will identify whether the measures contained within this CTMP are remaining effective. These programs will be completed by the Contractor in accordance with Section 7.
d	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;	Section 7.2 outlines the requirements which need to be included in any contingency plan to be implemented by the Head Contractor. Traffic Control Plans – outlined in Section 4.6 – shall be prepared to respond to specific work situations and subject to approval by the relevant Authority, providing a suitable level of independent oversight.
e	A program to investigate and implement ways to improve the environmental performance of the development over time;	Section 7 outlines the development of a program to monitor the effectiveness of this CTMP to be implemented by the Contractor and updated regularly. Note this CTMP relates construction of the development only, and therefore focuses on measures to minimise impacts associated with construction traffic (as per Sections 4 & 7).
f	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	Non-compliance protocol in relation to construction traffic management is outlined in Section 7.3 with wider management and reporting protocols outlined in the CEMP, of which this CTMP forms a part of. Reference is also made to Section 5.5 of this Plan in relation to incident management.
g	A protocol for periodic review of the plan	Refer Section 7.1 of this Plan.

C2	The Applicant must prepare a Construction Environmental Management Plan (CEMP) in accordance with the requirements of Condition C1 and to the satisfaction of the Planning Secretary.	The CTMP forms part of the overarching CEMP.
C3	As part of the CEMP required under Condition C2 of this consent, the Applicant must include the following:	N/A
a	Updated Construction Traffic Management Plan (see Condition B22)	This document is the updated CTMP

2 Site Context

2.1 Site Overview

The approved SSDA (SSD 10330) relates to land at 17 Roberts Road, Eastern Creek ("the Site", shown by **Figure 1**). The Site currently accommodates an existing data centre to its east and a further one is currently being constructed (with Hindmarsh as the lead Contractor).

The development itself includes 3 warehouse buildings providing a total of 44,113m^2 GFA, ancillary office spaces and plant rooms. Access to the development is proposed from Roberts Road. A secondary access is also to be provided along Capicure Drive. The Site is legally known as Lot 2 in DP 1159804 and is located within the Blacktown Local Government Area and the Eastern Creek Precinct of Western Sydney Employment Area. Canberra Data Centres Pty Ltd will be the final end-user of this development.

Figure 1: Site Location

2.2 The Approved SSD

In summary, the approved SSDA proposes the construction of a new data centre and ancillary office space to expand the operation of the existing data centre to the east of the Site.

There is data centre currently being constructed on the Site – which is nearing completion – known as Building 3 of the overall development and is effectively being developed as the second stage in development of the Site, (with the existing Data Centre to the east of the Site representing the first). The SSDA has provided approval for Buildings 4, 5 and 6.

The SSDA specifically has consent for:

- Site preparation works comprising:
  - Site preparation and mobilisation including clearing of land and importation of fill material;
  - Bulk and detail earthworks and support structures;
  - Estate stormwater management including construction of detention basins;
  - Construction of site access and estate internal roads;
  - Service and infrastructure augmentation;
  - Perimeter fencing;
  - Retaining wall;
  - Removal of trees; and
  - Environmental protection and management measures.
- Staged construction of buildings for a data centre with 24 hour/day, seven day/week operation:
  - Construction of three 3 storey data hall facilities (E4, E5, E6) including ancillary office spaces;
  - Additional rooftop plant and equipment for Building E3;
  - Fit out of buildings;
  - Construction of a store room;
  - Construction of deiseal generator enclosures;
  - A Security booth;
  - Landscaping works; and
- Construction of hardstand, loading area and a new consolidate car park.

A summary of the key components of the Proposal is provided in **Table 2**.

Table 2: Development Proposal Summary

Building	Warehouse GFA (m^2)	Office GFA (m^2)	Plant / Ancillary (m^2)
Building 3 (under Construction)	10,632	2,165	7,800
Building 4	12,090	4,712	7,098
Building 5	13,186	220	12,719
Building 6	13,044	220	6,795
Out Buildings	514	127	3,295
Total	49,466	5,444	37,707

A scaled Site Plan of the architectural plans prepared by EJE is provided below for context.

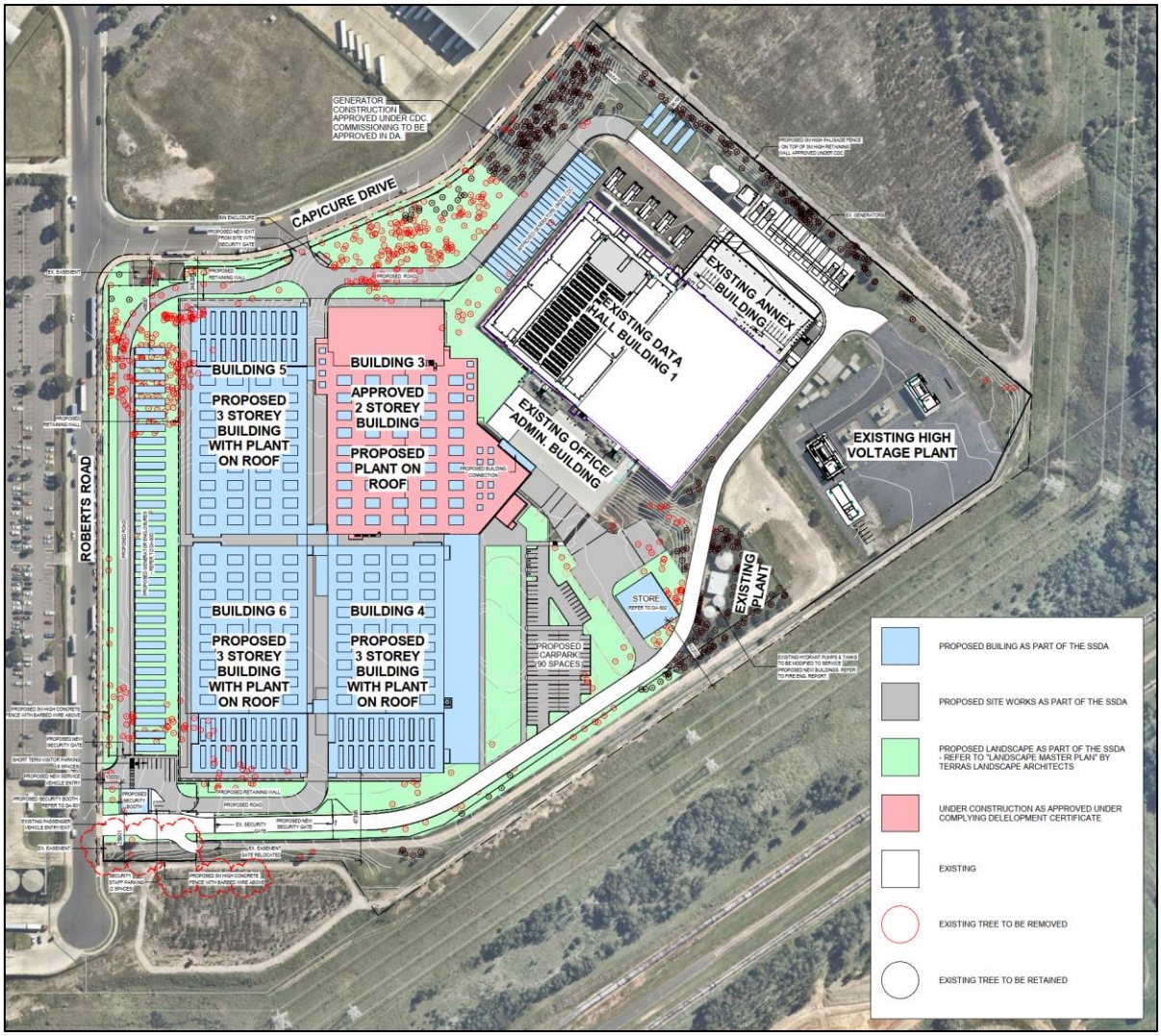


Figure 2: SSDA Site Plan

2.3 Key Site Access Roads

2.3.1 Roberts Road

Roberts Road is a local industrial road providing primary access to a number of local sites, and then access to the north to Old Wallgrove Road. Roberts Road provides 2 wide lanes for two-way traffic; on-street parking on both sides of the road; and has a speed limit of 60km/h.

2.3.2 Capicure Drive

Capicure Drive is a local industrial road which generally runs east-west between Mini Link Road and Roberts Road respectively and provides secondary access to a number of sites to the north of the Site. Capicure Drive provides 2 wide lanes for two-way traffic; on-street parking on both sides of the road; and has a speed limit of 60km/h.

2.3.3 Southridge Street

Southridge Street is a local industrial road providing primary access to a number of local sites, and then access to the north to Old Wallgrove Road. Southridge Street provides 2 wide lanes for two-way traffic; on-street parking on both sides of the road; and has a speed limit of 60km/h.

2.3.4 Old Wallgrove Road

Old Wallgrove Road (OWR) generally runs north-south in the vicinity of the OWE before turning to provide an east-west connection between Wallgrove Road and the M7 to the east and Lenore Drive (and through to Mamre Road) to the west. Significant upgrades of OWR have recently been completed by RMS, so it now provides a 4 – 6 lane divided carriageway (with 2 – 3 lanes per direction) and has a speed limit of 80km/h in the vicinity of the Oakdale Estate. These upgrades were assessed within the OWR Upgrade Report.

2.3.5 Mini Link Road

Mini Link Road is a short sub-regional connector between Wallgrove Road to the east and Old Wallgrove Road to the west and provides direct access to the M7 Motorway on and off ramps. Mini Link Road provides 4 lanes for two-way traffic and has a speed limit of 80km/h.

2.3.6 Wallgrove Road

Wallgrove Road is an arterial road that runs in a north-south direction to the east of the Site (parallel to the M7), between the M4 Motorway and Great Western Highway to the north, and Elizabeth Drive to the

south. In the vicinity of the Site, Wallgrove Road provides 4 - 6 lanes for two-way traffic, and has a posted speed limit of 80 km/h.

2.3.7 M7 Motorway

The M7 Motorway is a high capacity road link of state significance built to accommodate future traffic growth in the Western Sydney region. It provides a key north-south link to the east of the Site between the M2 Motorway and Great Western Highway to the north and the M5 Motorway to the south as part of the Sydney orbital road network. A major interchange between the M7 Motorway and M4 Western Motorway is located approximately 2.5 km north of the Site, which connects the Sydney CBD and western Sydney.

The M7 Motorway provides a 4-lane divided carriageway (2 lanes per direction) and has a posted speed limit of 100 km/h speed limit

2.4 Key Site Access Intersections

2.4.1 Roberts Road & Capicure Drive

This intersection operates under Give Way control, with priority to Roberts Road through movements; it provides no significant auxiliary infrastructure.

2.4.2 Old Wallgrove Road & Roberts Road

This signalised intersection provides for all movements to and from Roberts Road with significant turning infrastructure and pedestrian crossings of the western (Old Wallgrove Road) and southern (Roberts Road) approaches.

2.4.3 Capicure Drive & Southridge Street

This intersection provides a single lane roundabout and pedestrian refuges within the median on all approaches.

2.4.4 Old Wallgrove Road & Southridge Street

This signalised intersection provides for all movements to and from Southridge Street with significant turning infrastructure and pedestrian crossings of all approaches. A future northern approach to the intersection has also been designed to provide for all movements to / from Old Wallgrove Road and Southridge Street.

2.5 Existing Network Operation

2.5.1 Traffic Surveys

Traffic surveys were undertaken by Matrix Traffic & Transport Surveys in July 2019, including extended AM and PM peak period intersection surveys; and 24/7 tube counts of the Site, which was subject to existing construction traffic generation relating to another data centre. While local traffic volumes are expected to grow significantly in future years, the surveys provide significant context in regard to the traffic generation of the broader Estate, and for a comparison between previously forecast traffic volumes and actual traffic volumes. They also provide a better indication of short-term conditions for the (future detailed) assessment of potential construction traffic impacts.

AM peak hour and PM peak hour traffic volumes through the key intersections, as found by the surveys, are shown in **Figure 3** and **Figure 4**.

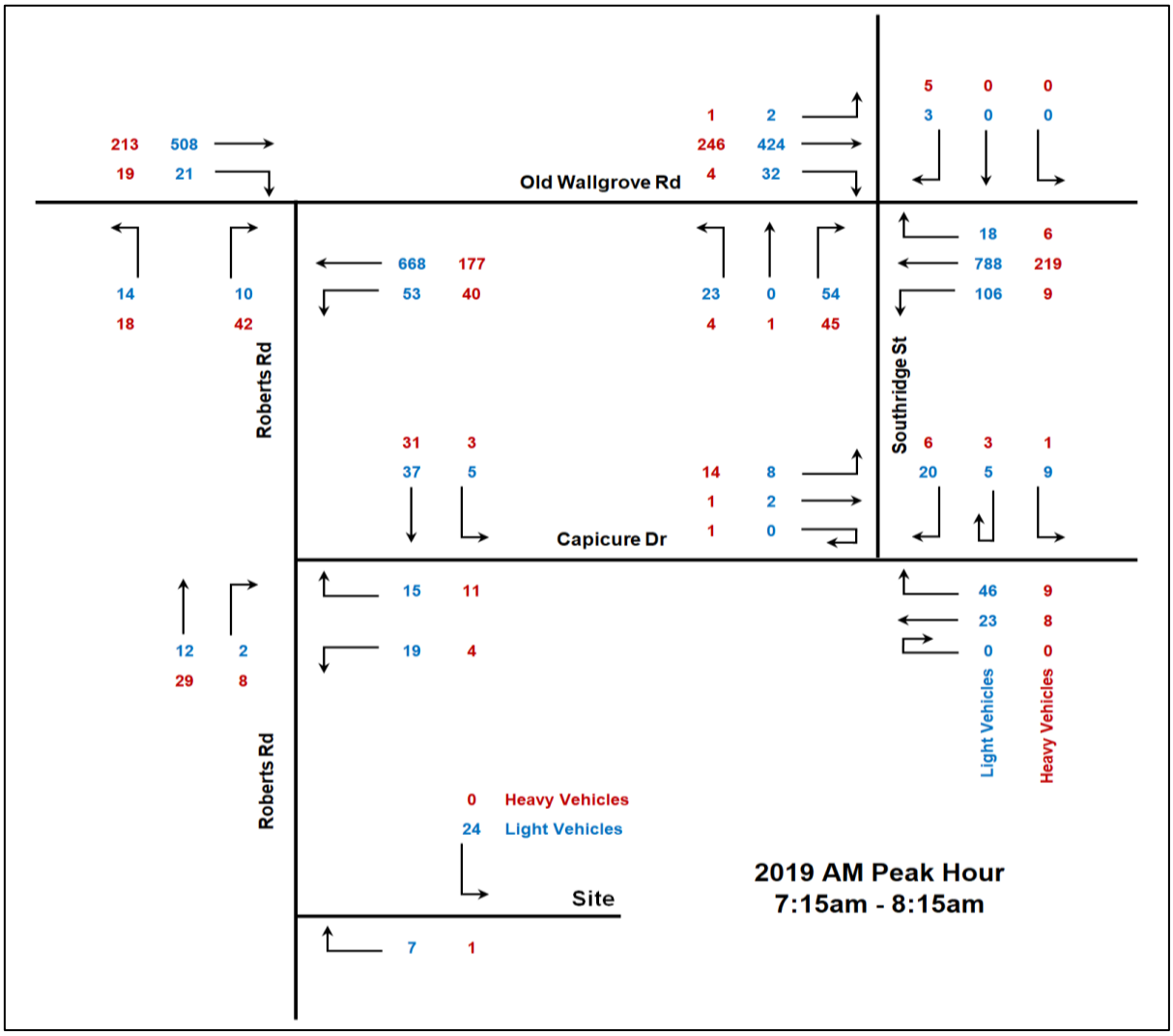


Figure 3: Existing AM Peak Hour Traffic Volumes

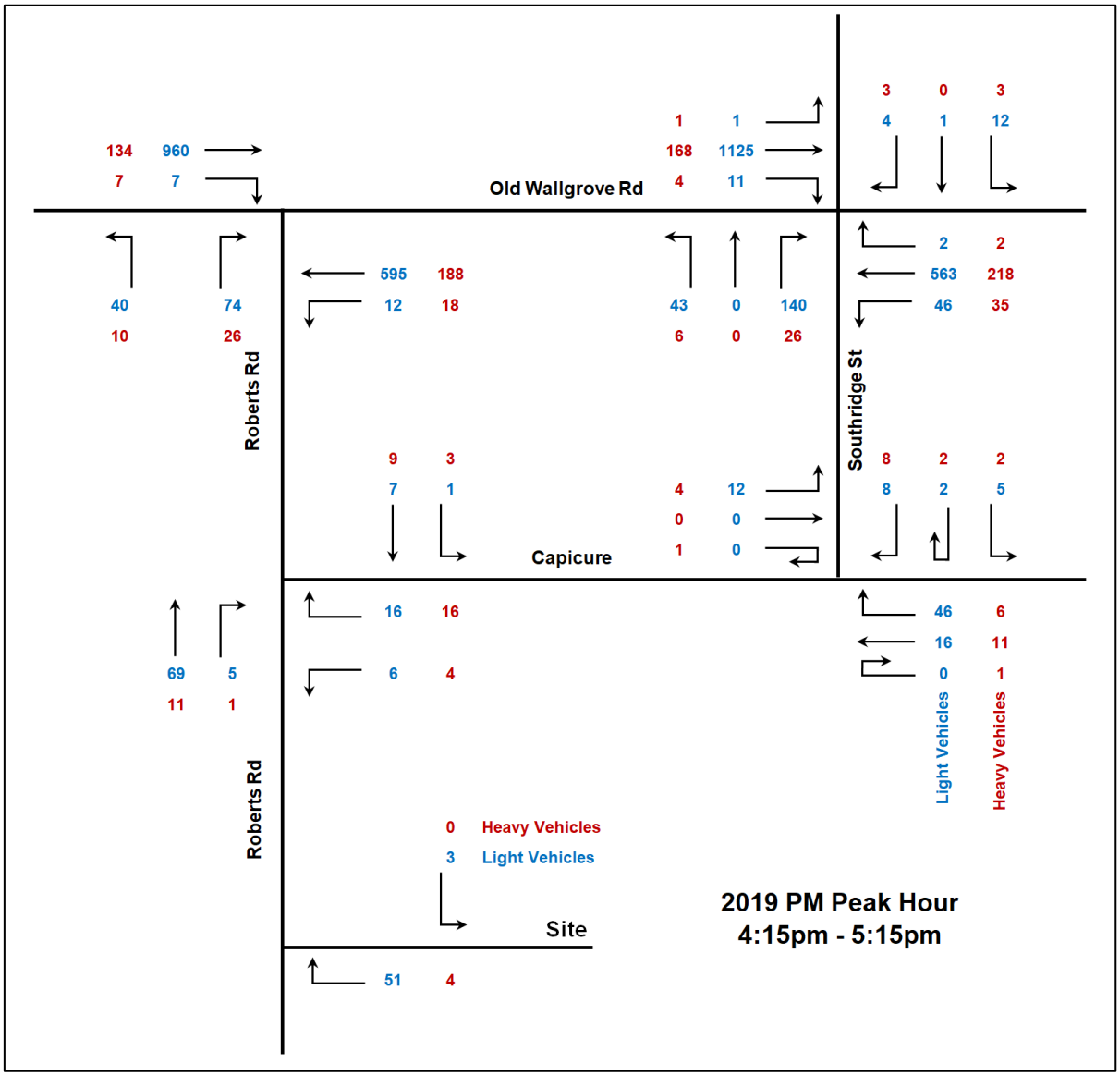


Figure 4: Existing PM Peak Hour Traffic Volumes

2.5.2 Existing Intersection Performance

The key intersections identified for assessment as part of this study include:

- Old Wallgrove Road / Roberts Road signals
- Old Wallgrove Road / Southridge Street
- Roberts Road / Capicure Drive Priority Controlled intersection
- Capicure Drive / Southridge Street single lane roundabout

The performance of the key intersections has been analysed using the RMS approved SIDRA intersection modelling software. SIDRA provides a range of performance measures, in particular:

- ***Degree of Saturation (DOS)****:* DOS is defined as the ratio of demand (arrival) flow to capacity.
- ***Average Vehicle Delay (AVD)***: AVD (or average delay per vehicle in seconds) provides a measure of the operational performance of an intersection and is used to determine an intersection's Level of Service (see below).
- ***Level of Service (LOS)****:* LOS is a comparative measure that provides an indication of the operating performance of an intersection based on AVD.

Table 3 provides a recommended baseline for assessment as per the RMS Guide:

Table 3: RMS Level of Service Summary

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

The local network performance is provided in **Table 4** which presents the SIDRA intersection modelling results of the key intersections under the existing "baseline" scenario.

The analysis indicated that the key intersections in the locality operate satisfactorily under the "baseline" scenario.

Table 4: Local Network Performance, Baseline Scenario

Intersection	Control Type	Period	DOS	AVD	LOS
Old Wallgrove Road / Roberts Road	Signals	AM	0.50	11.4	B
		PM	0.43	10.1	B
Old Wallgrove Road / Southridge Street	Signals	AM	0.61	28.3	B
		PM	0.68	25.4	B
Roberts Road / Capicure Drive	Priority	AM	0.05	5.6	A
		PM	0.05	4.8	A
Capicure Drive / Southridge Street	Roundabout	AM	0.08	9.8	A
		PM	0.07	10.5	A

2.6 Bus Services

2.6.1 Existing Bus Services

The existing bus services within the vicinity of the Site include Route 738 which provides a direct service between Mt Druitt Railway Station and the Site (Roberts Road); this loop service runs at a 30-minute headway during the AM and PM peak periods. Route 738 is shown in **Figure 5**, alongside the broader public and active transport services and facilities in the vicinity of the Site.

2.7 Pedestrian and Cycle Network

Old Wallgrove Road provides a regional cycle link between the M7 Cycleway and (via Lenore Drive) Mamre Road; off-road shared cycle and pedestrian paths are then provided south into the M7 Business Hub via Capicure Road, Southridge Road and Roberts Road, with the Roberts Road shared path extended all the way to the Site.

These paths provide essential links to the regional cycle network, in turn maximising the potential uptake of alternative transport modes such as cycling as opposed to the historic dominance of private vehicle travel.

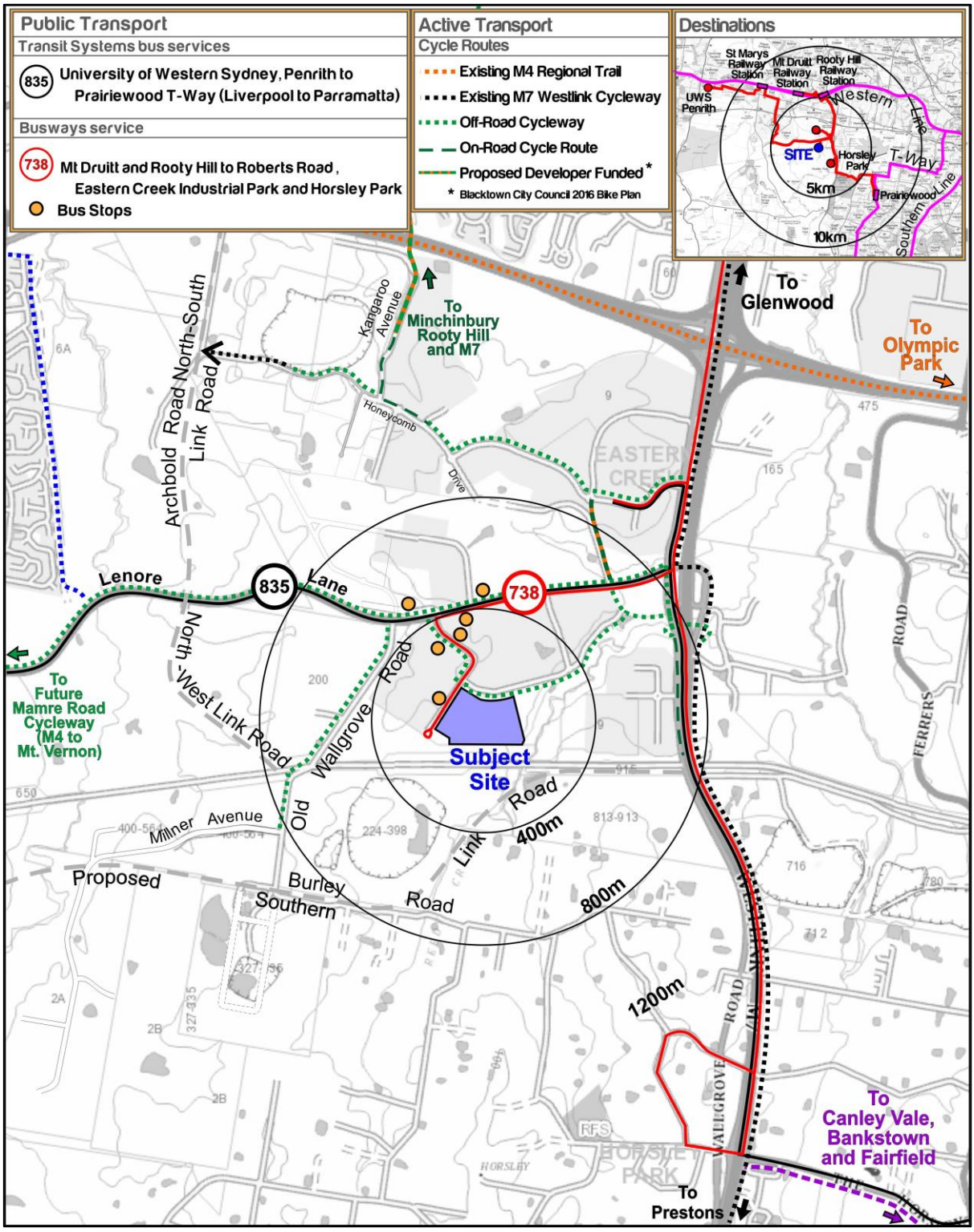


Figure 5: Public & Active Transport Network

3 Overview of Works

3.1 Construction Stages

The construction schedule is as follows:

- Demolition 4 weeks
- Excavation 6 weeks
- General Construction 52 weeks
- Concrete Pours 24 weeks
- External Finishes 12 weeks

3.2 Hours of Work

The anticipated hours of construction works are as follows:

- 7:00AM – 7:00PM Monday – Friday;
- 7:00AM – 4:00PM Saturday; and
- No work Sunday or public holidays.

It is not uncommon for work outside the hours above to be undertaken in the following circumstances:

- Works that are inaudible at the nearest sensitive receivers;
- Works agreed to in writing by the Planning Secretary;
- For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
- Where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.

3.3 Construction Vehicle Routes

It is proposed that construction vehicles would enter and exit the site via the routes shown in **Figure 6**. A copy of the truck routes is to be provided to all drivers prior to travel to the site. These routes seek to utilise the arterial road network as far as practicable, with the use of local roads only where required. The truck routes are summarised as followed:

Entry

- Trucks entering from the east / north / south will need to exit from the Westlink M7 or Wallgrove Road and drive along Old Wallgrove Road or Capicure Drive to access the Site.
- Trucks entering from the west will drive along Lenore Drive and turn right onto Roberts Road.

Exit

- Trucks which need to exit to the east / north / south will need to head towards the Westlink M7 or Wallgrove Road.
- Trucks exiting to the west will need to turn right onto Lenore Drive.

The routes are to be utilised by all construction vehicles associated with the Site and represents the shortest route between the local and arterial road network – hence minimising the impacts of the construction process. Access to the Site during all work phases will be monitored through vehicle gates where the existing haul road intersects with Old Wallgrove Road.

In addition, it is expected that no trucks are to queue on local roads and RMS Accredited Traffic Controllers (TC's) will have 2 way radio to control traffic flow two-way radios will be used to coordinate truck arrivals.

3.4 Vehicle Size

The largest vehicles anticipated to access the site during construction would generally be represented by Articulated Vehicles and Truck & Dog Vehicles. The surrounding road network permits these vehicles type by virtue of the industrial developments. A 19.6m truck and dog swept path has been provided in **Appendix A** which confirms that appropriate access can be provided.

Figure 6: Construction Vehicle Access Routes

4 Management Plan

4.1 Driver Code of Conduct

All drivers shall adhere to the Driver Code of Conduct, outlined in Section 5.

4.2 Loading & Materials Handling

Handling of all materials throughout the construction shall adhere to the following.

(b) It is proposed that all material loading will occur within the construction site boundary.

(c) No loading is proposed to occur outside of the provisioned areas.

(d) Equipment, materials and waste will be kept within the construction site boundary.

All materials handling shall be undertaken off the public roadway, however in the event materials handling are required from the roadway, then prior approval shall be sought and obtained from the relevant Authorities.

4.3 Work Zone Requirements

Having regard for the above, no on-street Works Zone is proposed. A separate application would be required in the event that any special or discreet work activities do require the use of kerbside parking for the purposes of a Works Zone.

4.4 Fencing Requirements

Temporary exclusion fencing will be erected along the entire boundary of the site and will be maintained for the duration of the construction program. The fencing is to ensure unauthorised persons are kept out of the Site. Site access gates would be provided within Estate Road 03 and will be closed at all times outside of the permitted construction hours.

Careful consideration for pedestrian protection shall be included within relevant TCP's, as outlined below.

4.5 Cyclist & Pedestrian Management

Man-proof fencing shall be provided along all site frontages accessible by the public to prevent unwanted cyclist access.

Consideration for cyclist protection shall be included within relevant TCPs, as outlined below.

4.5.1 Emergency and Service Vehicle Management

Emergency vehicle access to and from the Site will be available at all times while the Site is occupied by construction workers. This process would be implemented through emergency protocols on the site which will be developed by the Contractor.

Service vehicles for the existing data centre development will still retain access via the Roberts Road access road.

4.6 Traffic Control Plans

Any Traffic Control Plans (TCPs) shall be prepared by an accredited person, in accordance with the RMS Traffic Control at Worksites Manual and AS1742.3. See **Appendix B** for current TCP, which has been prepared by commercial TP Pty Ltd. It is noted that this TCP has not been verified by Ason Group, with the relevant details of the accredited person shown on the TCP.

All TCPs involving signage or impacts to public roads shall be approved by RMS Traffic Management Centre, prior to the works for which they relate. These TCPs shall be updated to respond to any changes to prevailing traffic conditions throughout the life of the works.

4.7 Contractor Parking

Contractor parking spaces will be provided on-site to accommodate for on-site staff. Throughout the development of the data centre campus, the temporary carparking will provide on-site parking spaces for the phased construction of the campus.

The temporary carparking would accommodate 100+ vehicles in addition to the 90 car spaces proposed for the final development. The exact location of these temporary parking spaces will be established by the Contractor, as required.

It is the Contractor's responsibility to ensure that the proposed turning areas are fee from objects and obstacles including parked cars, at all times. An existing parking layout on the construction site is detailed in **Figure 7** noting a similar management plans would be provided as construction of each building is undertaken and the Site set-up needs to change as required. Noting the large size of the Site itself, the required contractor parking will be able to be accommodated within the Site.

Figure 7: Existing Site Management Plan (For Current 2020 Construction Activities)

5 Drivers Code of Conduct

5.1 Objectives of the Drivers Code of conduct

- To minimise the impact of earthworks and construction on the local and regional road network;
- Minimise conflict with other road users;
- Minimise road traffic noise; and
- Ensure truck drivers use specified routes.

5.2 Code of Conduct

The code of conduct requires that while driving any vehicle for work-related purposes, drivers must comply with all of the following:

- Demonstrate safe driving and road safety activities
- Abide by traffic and road legislation
- Follow site signage and instructions
- Drivers must only enter and exit the site via the allocated entry and exit points and travel routes.

The below activities in any vehicles will be considered as a breach of conduct and will result in removal from site:

- Reckless or dangerous driving causing injury or death
- Driving whilst disqualified or not correctly licensed
- Drinking or being under the influence of drugs while driving
- Failing to stop after an incident
- Loss of demerit points leading to suspension of licence
- Any actions that warrant the suspension of a licence
- Exceeding the speed limit in place on any permanent or temporary roads
- Any vehicles found to be in breach to undergo driver induction on the spot and their manager/dispatch advised; repeat offenders to be prevented from returning to site

5.3 Driver Responsibilities

All Drivers on site must:

- Be responsible and accountable for their actions when operating a company vehicle or driving for the purposes of work.
- Display the highest level of professional conduct when driving a vehicle at work.
- Ensure they have a current driver licence for the class of vehicle they are driving, and this licence is to be carried.
- Immediately notify their supervisor or manager if their drivers' licence has been suspended, cancelled, or has had limitations applied.
- Comply with all traffic and road legislation when driving.
- Assess hazards while driving.
- Regularly check the oil, tyre pressures, radiator and battery levels of company vehicles they regularly used.
- Drive within the legal speed limits, including driving to the conditions.
- Obey all on-site signposted speed limits and comply with directions of traffic control supervisors in relation to movements in and around temporary or fixed work areas.
- Not drive outside of the approved heavy vehicle routes. All drivers must obey weight, length and height restrictions imposed by the National Heavy Vehicle Regulator (NHVR), and other Government agencies. Heavy Vehicles shall adhere to the routes outlined in Section 6.
- Be cognisant of the noise and emissions requirements imposed within the NSW / Australian Road Rules. Works must be constructed with the aim of minimising construction noise and drivers must drive in a manner to reduce noise, such as limiting compression braking and adhering to items within the Road Rules, such as driving a vehicle in a way that makes unnecessary noise or smoke.
- Do not queue on public roads unless a prior approval has been sought.
- Be aware that at no time may a tracked vehicle be permitted or required on a paved road.
- Never drive under the influence of alcohol or drugs, including prescription and over the counter medication if they cause drowsiness – to do so will merit disciplinary measures.
- Wear a safety seat belt at all times when in the vehicle.
- Avoid distraction when driving – the driver will adjust car stereos/mirrors etc. before setting off, or pull over safely to do so.

- Report ALL near-hits, crashes and scrapes to their manager, including those that do not result in injury.
- Report infringements to a manager at the earliest opportunity.
- Report vehicle defects to a manager prior to the next vehicle use.
- Follow the authorised site access and egress route
- Follow speed limits as imposed within the Site.
- Keep loads covered at all times.

5.4 Contractor Responsibilities

The Lead Contractor is responsible to take all steps necessary to ensure company vehicles are as safe as possible and will not require staff to drive under conditions that are unsafe.

This will be achieved by undertaking the following:

- Ensuring all vehicles are well maintained and that the equipment enhances driver, operator and passenger safety by way of:
  - Pre-commencement checks for all new plant arriving on-site.
  - Daily prestart inspections for all plant and equipment currently on-site.
  - All construction plant must be fitted with a flashing light, fire extinguisher and reverse alarms.
  - Ensure all operators onsite have a current verification of competency (VOC) for their current driver's licence of the appropriate class.
  - Ensure maintenance requirements are met.
- Identify driver training needs and arranging appropriate training or re-training. This may include providing the below:
  - Operator VOC assessment as part of all inductions.
  - Regular Toolbox discussions on safety features, managing fatigue, approved heavy routes, driver responsibility and drink-driving.
- Encouraging Safe Driving behaviour by:
  - Ensuring the subcontractor is informed if their staff become unlicensed.
  - Not covering or re-imbursing staff speeding or other infringement notices.
  - Ensuring Legal use of mobile phones in vehicles while driving only and that illegal use is not undertaken.

- Encouraging better fuel efficiency by:
  - Use of other transport modes or remote conferencing, whenever practical.
  - Providing training on, and circulating information about, travel planning and efficient driving habits.

5.5 Crash or Incident Procedure

In the case of a crash, or any incident involving a vehicle that could cause disruption (such as an oil or fuel spillage and vehicle breakdown) the following procedures must be implemented:

- As soon as reasonably practical, report incidents to the incident response team who will ensure that the appropriate response is provided to unplanned incidents (i.e. in the instance of as spillage, the Site Spill Kit is deployed to clean up any spillages).
- In the instance of a break down – contact you manager / deployment team as soon as possible for them to deploy the specialist recovery personnel for the specific vehicle you are driving.
- Stop your vehicle as close to it as possible to the scene, making sure you are not hindering traffic. Ensure your own safety first, then help any injured people and seek assistance immediately if required.
- Ensure the following information is noted:
  - Details of the other vehicles and registration numbers
  - Names and addresses of the other vehicle drivers
  - Names and addresses of witnesses
  - Insurers details
- Give the following information to the involved parties:
  - Name, address and company details
- If the damaged vehicle is not occupied, provide a note with your contact details for the owner to contact the company.
- Ensure that the police are contacted should the following circumstances occur:
  - If there is a disagreement over the cause of the crash.
  - If there are injuries.
  - If you damage property other than your own.
- As soon as reasonably practical, report all details gathered to your manager.

5.6 Environmental Procedures.

A range of measures — as per the requirements for environmental and sedimentation control plans — shall be implemented to ensure the following:

- That no dirt or debris from the construction vehicles is tracked on to the public road network,
- Reduce the impacts to sensitive receivers, including, where practicable, starting noisy equipment away from sensitive receivers and implementing respite period,
- Watering of dusty activities will be undertaken, or activities temporarily halted and then resumed once weather conditions have improved,
- Containment measures for spillages will be provided at appropriate locations and in close proximity to staff car park areas, dangerous goods stores areas and main Project work areas,
- All vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria, and
- Keep an accurate record which includes the range of measures undertaken to reduce environmental impacts.

Furthermore, it is expected that all drivers will ensure that all loads are safely covered and / or restrained whilst driving on the public road network.

6 Construction Traffic Assessment

6.1 Construction Trip Generation

6.1.1 Staff Trips

Ason Group has consulted with Hindmarsh regarding the maximum personnel on site at any one time during each stage.

- Demolition 30 staff
- Excavation 40 staff
- General Construction 350 staff
- Concrete Pours 150 staff
- External Finishes 100 staff

As expected, the highest demand for staff occurs during the general construction stage. Light vehicle traffic generation would generally be associated with construction staff movements to and from the Site, including Project Managers, trade and general construction employees. Hindmarsh has advised that not all 350 staff would arrive during specific peak periods and would accumulate across the working day.

A traffic survey of the Roberts Road access undertaken during July 2019 for a period of one week. During this survey period, construction activities have already commenced on-site at the data centre. From this survey data, it can be estimated that that the peak hour arrival period is between 6 – 7AM.

On a conservative estimate, it is assumed that all 350 workers would be arriving on-site between 5AM – 8AM based on survey data. Therefore, approximately 49% of all construction staff would arrive between 6 – 7AM.

The peak afternoon construction departure period is between 3 – 4PM. To account for the weekday 7PM finish time, the time between 3 – 6PM was taken as the peak PM construction departure period. Therefore, approximately 40% of all construction vehicles movements between 3 – 6PM occur at 3 – 4PM (work finishes at 7PM).

With 350 staff, it is assumed that 49% of staff would be arriving on site at 6 – 7AM and 40% of staff will depart at 3 – 4PM. Accounting for the projected 1.2 vehicle occupancy, it is estimated that the following construction peak periods for light vehicles would occur:

- 6 - 7 AM 143 veh/hr
- 3 - 4 PM 117 veh/hr

It is notable that these peak hour periods occur outside of peak road network hours of 7 – 9AM and 4 – 6PM.

For construction trips occurring during the road network peak hours, it has been assumed using the survey data that 21% of staff would arrive on-site between 7 – 8AM and 27% of staff would depart between 4 – 5PM. Applying these rates to 350 staff and accounting for the estimated 1.2 vehicle occupancy, the following construction traffic generation would occur during the road network peak hours:

- 7 - 8 AM 61 veh/hr
- 4 - 5 PM 96 veh/hr

6.1.2 Heavy Vehicle Trips

Based on information provided by Hindmarsh, the heavy vehicle movements required for the construction of the SSDA development include:

- A peak of 25 trucks per day (50 in/out movements).
- 5 truck in/out movements would occur during the peak hours (7-8AM and 4-5PM).

The traffic surveys of the Site recorded 5-8 truck in/out movements per hour. It is worthy of note here that the peak truck movements occurred during the middle of the day (minimising the impact of truck movements on the road network during peak hours).

The existing Data Centre was forecast to generate 15 – 30 small truck vehicle movements per day (in the form of maintenance vehicles) and could generate some 3 peak hour truck trips.

Therefore, it is reasonable to assume that the current construction activities are generating the same level of trucks that the future activities would and thus, are already accounted for on the road network. This assumes that the truck volumes recorded by the traffic surveys represent:

- A peak of 3 truck trips per hour generated by the operational development.
- A peak of 5 trucks trips per hour associated with current construction activities.

Therefore, any increase in construction traffic generation related to this SSDA is expected to be associated with light vehicles only.

6.1.3 Total Construction Trips

In order to assess the net total construction trips, the average weekday traffic count at the Roberts Road access was used to estimate the existing traffic construction traffic generation already on the road network. This is required as the intersection surveys already include the existing construction traffic generation that is currently occurring on-site. As mentioned in **Section 6.1.2**, the traffic count already includes the peak hour construction truck trip generation of 5 trucks an hour.

Given that the construction of Building 3 will likely be finished before construction starts for Buildings 4-6, there would only be construction traffic generated from Buildings 4-6. Therefore, in order to calculate the construction traffic impact on the surrounding road network, the traffic generation analysis takes into account the current Building 3 construction traffic in the traffic survey data.

The net construction traffic generation increase was calculated by subtracting the existing traffic volumes at the Roberts Road access from the estimated peak hour traffic generation calculated in **Section 6.1.1** while also considering the existing data centre traffic generation.

It was surveyed that during average weekday, there was a peak hour volume of 97 movements in the AM and 59 movements in the PM from the Site. Assuming during off-peak hours that there are approximately 5 existing heavy construction vehicle movements and 3 existing data centre heavy movements per hour, and there is a net increase of light construction traffic as follows:

- 6 - 7 AM +54 veh/hr
- 3 - 4 PM +66 veh/hr

In order to assess the construction traffic impacts in line with traditional assessments, the net additional construction traffic generation was also calculated during the road network peak hours.

Assuming during peak hours that there are approximately 5 existing construction heavy vehicles and 13 data centre movements per hour (10 staff and 3 heavy vehicles), and a surveyed average weekday road network peak hour volume of 41 movements in the AM and 48 movements in the PM, there is a net increase of:

- 7 - 8 AM +38 veh/hr
- 4 - 5 PM +66 veh/hr

The following sections detail the construction traffic impacts resulting from the estimated construction traffic generation.

6.1.4 Daily Construction Trips

Based on the Builder's estimates, there would be a peak 350 staff on-site at any one time and 50 truck movements per day. Using a car occupancy of 1.2 staff per light vehicle, there would be a total of 292 light vehicles arriving and 292 light vehicles leaving. As such, the estimated total peak daily construction traffic generation would be 634 construction-related vehicles per day (consisting of 584 light vehicle movements and 50 trucks movements).

The survey undertaken at the Roberts Road Access Driveway indicates an average weekday traffic volume of 642 vehicles per day. Assuming some 25-50 existing daily data centre vehicle movements, this is approximately 592 – 617 existing construction-related traffic movements. It is noteworthy that on

the 24th of July 2019, a peak daily volume of 717 vehicles was recorded at the Roberts Road access which would be higher than the forecasted daily construction traffic volumes associated with construction of the development.

Therefore, it is evident that the future construction activities would be similar to the current construction activities. Consequently, the peak hour increase in trips discussed in Section 6.1.3 above are likely to represent a conservative assessment and it is expected that construction related to the development would have little impact when compared to the current road conditions.

6.2 Construction Trip Assignment

With reference to the construction vehicle access routes discussed in Section 3.3, the additional construction vehicle trips generated by the peak phase of construction and their movements through the road network are shown by **Figure 8**, and **Figure 9.**

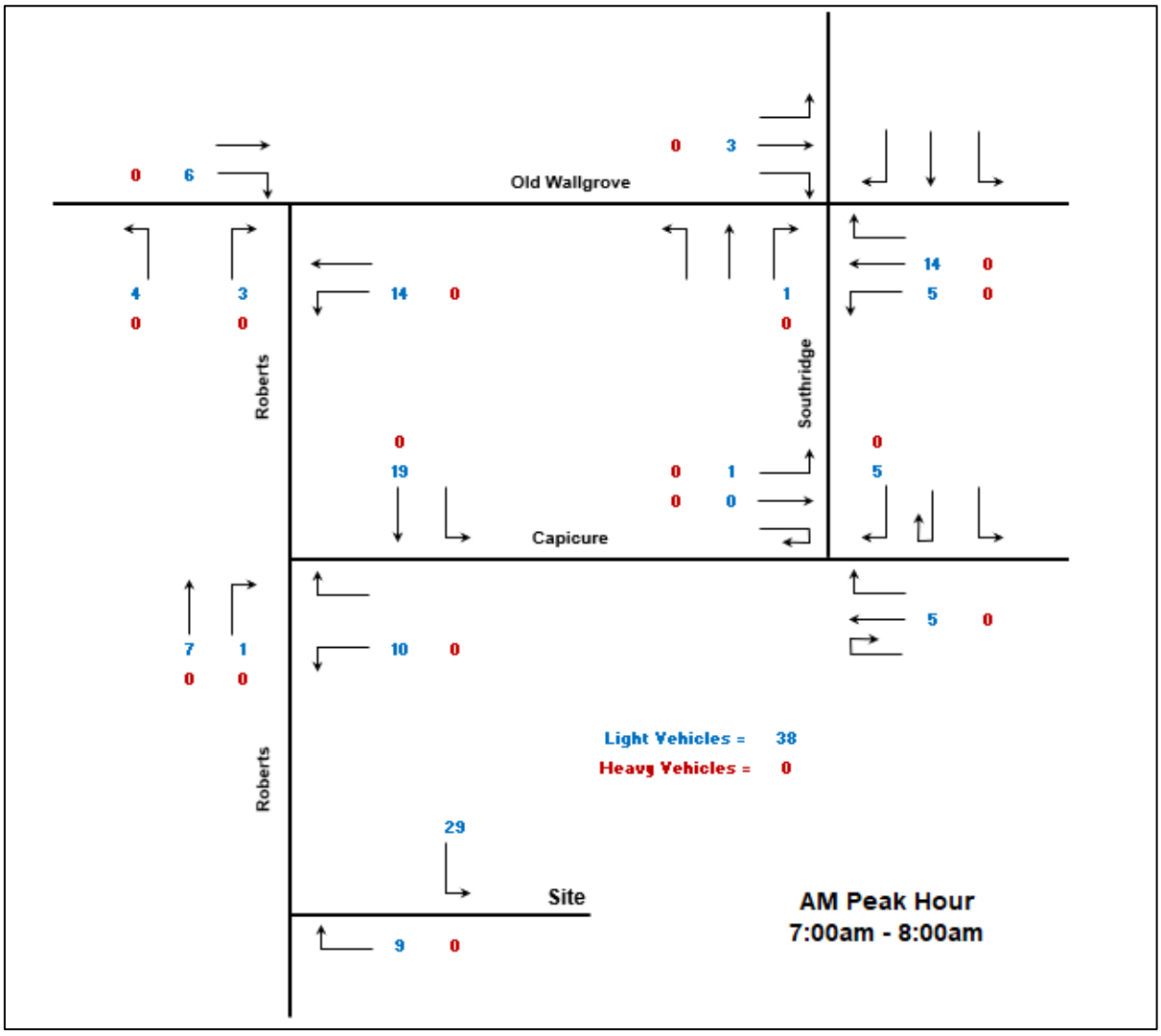


Figure 8: AM Peak Hour Construction Traffic

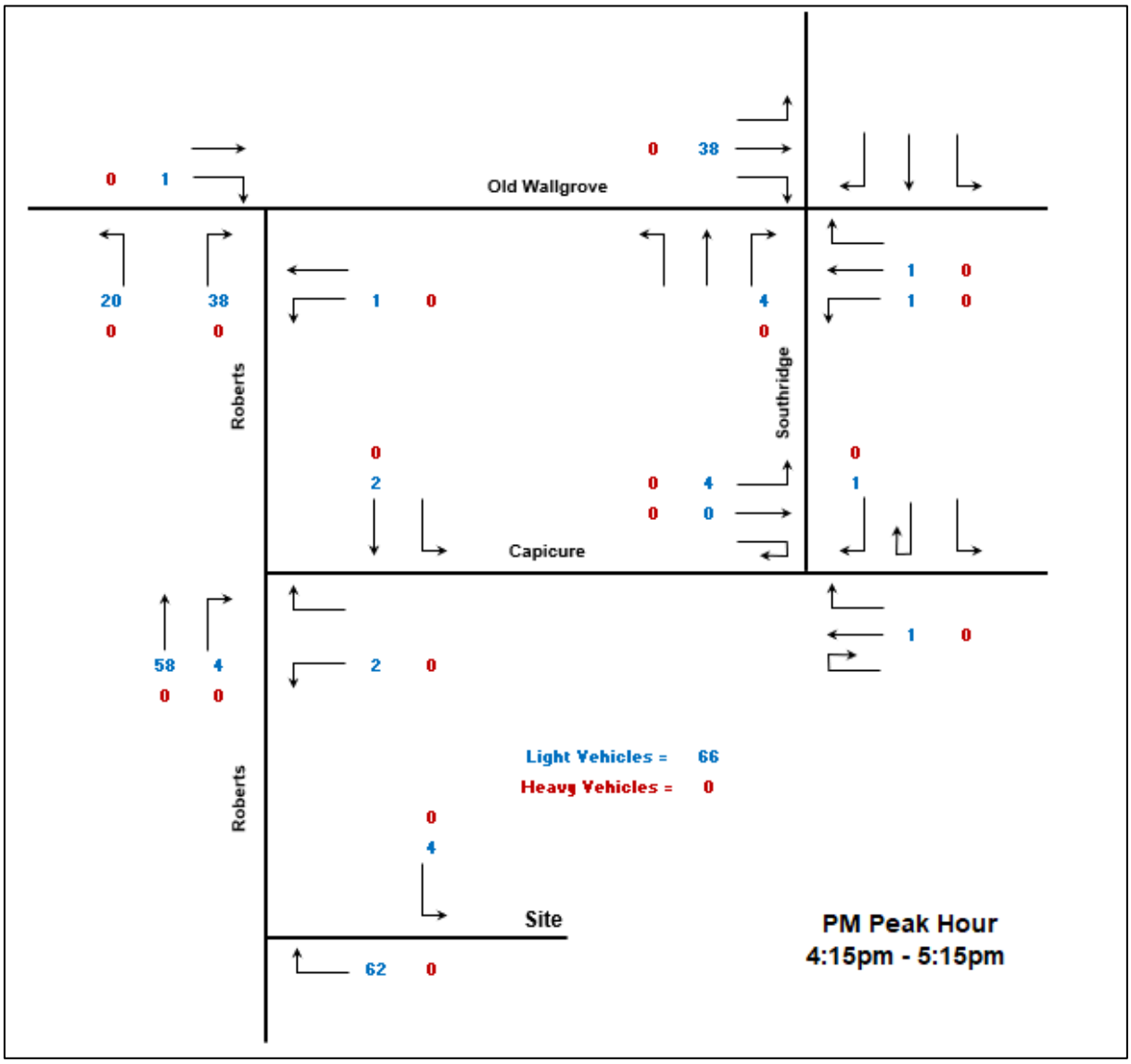


Figure 9: PM Peak Hour Construction Traffic

6.3 Construction Traffic Impacts

6.3.1 Intersection Performance

The impact of the additional construction traffic associated with the Data Centre on the critical intersections (being Roberts Road / Old Wallgrove Road and Southridge Street / Old Wallgrove Road) has been assessed as a net increase over and above the existing on-street conditions and the results of this analysis are provided in **Table 5**.

Table 5: Local Network Performance, with Construction Traffic

Intersection	Scenario	Period	DOS	AVD	LOS
Old Wallgrove Road / Roberts Road	Existing	AM	0.50	11.4	B
		PM	0.43	10.1	B
	With Peak Construction	AM	0.50	11.7	B
		PM	0.44	10.8	B
Old Wallgrove Road / Southridge Street	Existing	AM	0.61	28.3	B
		PM	0.68	25.4	B
	With Peak Construction	AM	0.59	24.4	B
		PM	0.69	25.5	B

The SIDRA analysis indicates that the additional traffic generated by construction of the development would result in only minor increases in DoS and AVD and – importantly – LoS would remain unchanged. In summary, the traffic impact analysis concludes that the net construction traffic generation volumes are of a sufficiently low order that once distributed on to the surrounding road network, the impacts of these volumes at the key intersections would be negligible and the intersections would operate as currently occurs.

6.4 Cumulative Construction Traffic Impacts

There are no major construction activities currently occurring within the vicinity of the Site. The nearest major construction site is at 45 Eastern Creek Drive which is approximately 1.15km to the north of the Site. All construction traffic from other construction sites will likely be along Old Wallgrove Road as this is the major corridor towards the Westlink M7.

It is therefore notable that all existing construction traffic travelling along Old Wallgrove Road would has been captured in the recent traffic surveys. SIDRA intersection analysis has been undertaken at the key intersections of Roberts Road / Old Wallgrove Road and Southridge Street / Old Wallgrove Road which includes these existing construction traffic. These results, as mentioned before, show that the cumulative construction traffic impact would be negligible.

6.5 Construction Traffic Impact Minimisation

All heavy vehicles will be directed onto the major arterial roads such as the Westlink M7 via the shortest possible route to minimise effects along the local roads and Old Wallgrove Road. It is important to note that all contractors would be expected to arrive on-site outside of AM peak hours (before 7AM start) and typically leave at varying times which spread the construction traffic generation effects before/after and across the network peak hours. Therefore, traffic impacts to the operation of the road network are anticipated to be minimal.

7 Plan Administration

7.1 Monitoring Program

This CTMP shall be subject to ongoing review and will be updated accordingly. Regular reviews will be undertaken by the on-site coordinator. As a minimum, review of the CTMP shall occur monthly.

All and any reviews undertaken should be documented, however key considerations regarding the review of the CTMP shall be:

- Tracking deliveries against the volumes outlined within this report. Deliveries will be tracked against approved volumes and will keep a vehicle log - including rego, time of entry & route taken - for the purpose of assessing the effectiveness of these monitoring programs.
- To identify any shortfalls and develop an updated action plan to address issues that may arise during construction (Parking and access issues).
- To ensure TCP's are updated (if necessary) by "Prepare a Work Zone Traffic Management Plan" card holders to ensure they remain consistent with the set-up on-site.
- Regular checks undertaken to ensure all loads are leaving site covered as outlined within this CTMP.
- A Dilapidation report shall be undertaken every periodically to assess the condition of the road and note whether there has been any reduction in quality of the road as result of construction vehicles.

The development of a program to monitor the effectiveness of this CTMP shall be established by the Head Contractor, with monitoring to be undertaken on a monthly basis. This process will form part of the overarching monitoring plan required to be included as part of the Construction Environmental Management Plan (CEMP), of which this CTMP forms a part of as per Condition C3(a) of the Consent.

7.2 Contingency Plan

A contingency plan will to be implemented by the Contractor to support the monitoring program. This contingency plan must include the items detailed in **Table 6** to be undertaken by the builder in the event that the monitoring program identifies this management plan is not effective in managing the construction impacts.

Table 6: Contingency Plan

Risk		Condition Green	Condition Amber	Condition Red
Construction Movements	Trigger	Construction traffic volume is in accordance with permissible and programmed volume and time constraints	Construction traffic volumes exceeds programmed volume but is within permissible volume constraints	Construction traffic volumes exceeds permissible volume and time constraints
	Response	No response required Continue monitoring program	Review and investigate construction activities, and where appropriate, implement additional remediation measures such as: - Temporary halting of activities and resuming when conditions have improved - Review CTMP and update where necessary - Provide additional training	Review and investigate construction activities. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies. Where appropriate, implement additional remediation measures such as: - Temporary halting of activities and resuming when conditions have improved - Stop all transportation into and out of the site. - Review CTMP and update where necessary. - Provide additional training
	Trigger	Construction traffic utilises the approved heavy vehicle routes and maintains the appropriate weight limits identified by the NHVR.	Construction traffic utilises similar routes to the approved routes and generally maintains the appropriate weight limits identified by the NHVR.	Construction traffic does not utilise approved construction routes and does not maintain the appropriate weight limits identified by the NHVR.
	Response	No response required Continue monitoring program	Review and investigate construction activities, and where appropriate, implement additional remediation measures such as: - Review vehicles arriving to site and remind them of the strict routes - Provide additional training (including toolbox talks and further notification of Driver Code of Conduct)	Review and investigate construction activities. If it is concluded that construction activities were directly responsible, submit an incident report to government agencies. Where appropriate, implement additional remediation measures such as: - Stop all transportation into and out of the site. - Review CTMP and update where necessary.

Risk		Condition Green	Condition Amber	Condition Red
				- Provide additional training (including toolbox talks and further notification of Driver Code of Conduct).
Queuing	Trigger	No queuing identified	Queuing identified within site	Queuing identified on the public road
	Response	No response required Continue monitoring program	Review the delivery schedule prepared by the builder. If drivers are not following the correct schedule, then they should be provided with additional training and an extra copy of the Driver Code of Conduct	Review and investigate construction activities. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies. Where appropriate, implement additional remediation measures such as: - Temporary halting of activities and resuming when conditions have improved - Stop all transportation into and out of the site. - Review CTMP and update where necessary. Provide additional training.
Noise	Trigger	Noise levels do not exceed imposed noise constraints	Noise levels in minor excess of imposed noise constraints	Noise levels greatly in excess of imposed noise constraints
	Response	No response required Continue monitoring program.	Undertake all feasible and reasonable mitigation and management measures to minimise noise impacts.	Undertake all feasible and reasonable mitigation and management measures to ensure noise levels are below Highly Noise Affected criteria. If noise levels cannot be kept below applicable limits, then a different construction method or equipment must be utilised.
Traffic Control Plans	Trigger	No observable issues	Minor inconsistencies with TCP to onsite operations	Near miss or incident occurring regardless of / as a result of the TCP being implemented
	Response	No response required Continue monitoring TCPs.	Traffic Controller to amend TCP on site and to keep a log of all changes	Stop work until an investigation has been undertake into the incident. There are to be changes made to the TCP to ensure

Risk		Condition Green	Condition Amber	Condition Red
				that the safety of all workers, students and civilians are catered for.
Dust	Trigger	No observable dust	Minor quantities of dust in the air and tracking on to the road	Large quantities of dust in the air and tracking on to the road
	Response	No response required Continue monitoring program	Review and investigate construction activities and respective control measures, where appropriate. Implement additional remedial measures, such as: - Deployment of additional water sprays - Relocation or modification of dust-generating sources - Check condition of vibrating grids to ensure they are functioning correctly - Temporary halting of activities and resuming when conditions have improved	Review and investigate construction activities and respective control measures. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies. Implement relevant responses and undertake immediate review to avoid such occurrence in future.

It is therefore proposed to incorporate the above items within the communications strategy. The contingency plan outlines the most effective methods to ensure that each item identified within the Monitoring Program is adhered to, resulting in the impacts to the wider community being minimised. It also represents the efforts undertaken to continually improve CTMP and ensure that the processes being utilised are indeed best practice.

7.3 Communications Strategy

A communications strategy shall be established by the Head Contractor and is included in the overarching CEMP. The communications strategy outlines the most effective communication methods to ensure adequate information within the community and assist the project team to deliver the traffic changes with minimal disruption to the road network. It shall include:

- Erection of signs providing advanced notice of works and any traffic control measures to be implemented.
- Written notices to surrounding landowners (and tenants) likely to be directly affected by the works, prior to commencement.

Ongoing communication is also required so that all stakeholders are kept up to date of works and potential impacts.

A communications strategy shall be established by the Contractor and form part of the overarching CEMP. The Contractor is to notify the key stakeholders and Planning Secretary when traffic is expected to exceed the parameters set within "Condition Green" of Table 6.

Table 7 outlines an indicative communication strategy to ensure that adequate communication with key stakeholders have been met.

Table 7: Communication Strategy

Risk	Impact	Comms Channel
Wider Traffic Disruption	Wider community and stakeholders informed through local and wider advertising and notification	Stakeholder Meetings Stakeholder email blast
Construction related traffic	Ensure construction crews use traffic routes identified in the Traffic Management Plan, and Ensure residents in area are notified in advance to any traffic changes that may affect them	

8 Summary

This CTMP has been prepared to ensure appropriate traffic management is undertaken during construction of the data centres at 17 Roberts Road, Eastern Creek. This document has been prepared having regard for the principles outlined in the RMS Traffic Control at Worksites Manual (2018) and AS1742.3:2019 and is recommended for adoption. The following measures should be undertaken to minimise the impacts across each construction phase:

- Traffic management of pedestrians and vehicles at the Site access.
- Construction and delivery vehicles would be limited to the use of the approved heavy vehicle routes and the necessary local roads.
- All vehicles transporting loose materials will have the load covered and/or secured to prevent any items depositing onto the roadway during travel to and from the Site.
- All vehicles to enter and exit the site in a forward direction.

In summary, the CTMP report is proposed in accordance with the RMS TCAW.

Appendix A

Revision notes:

Rev:	Date:	Notes:

For information purposes only - not for construction

Drawn By: VC

Client: CDC

Project: 1027
17 Roberts Road, Eastern Creek

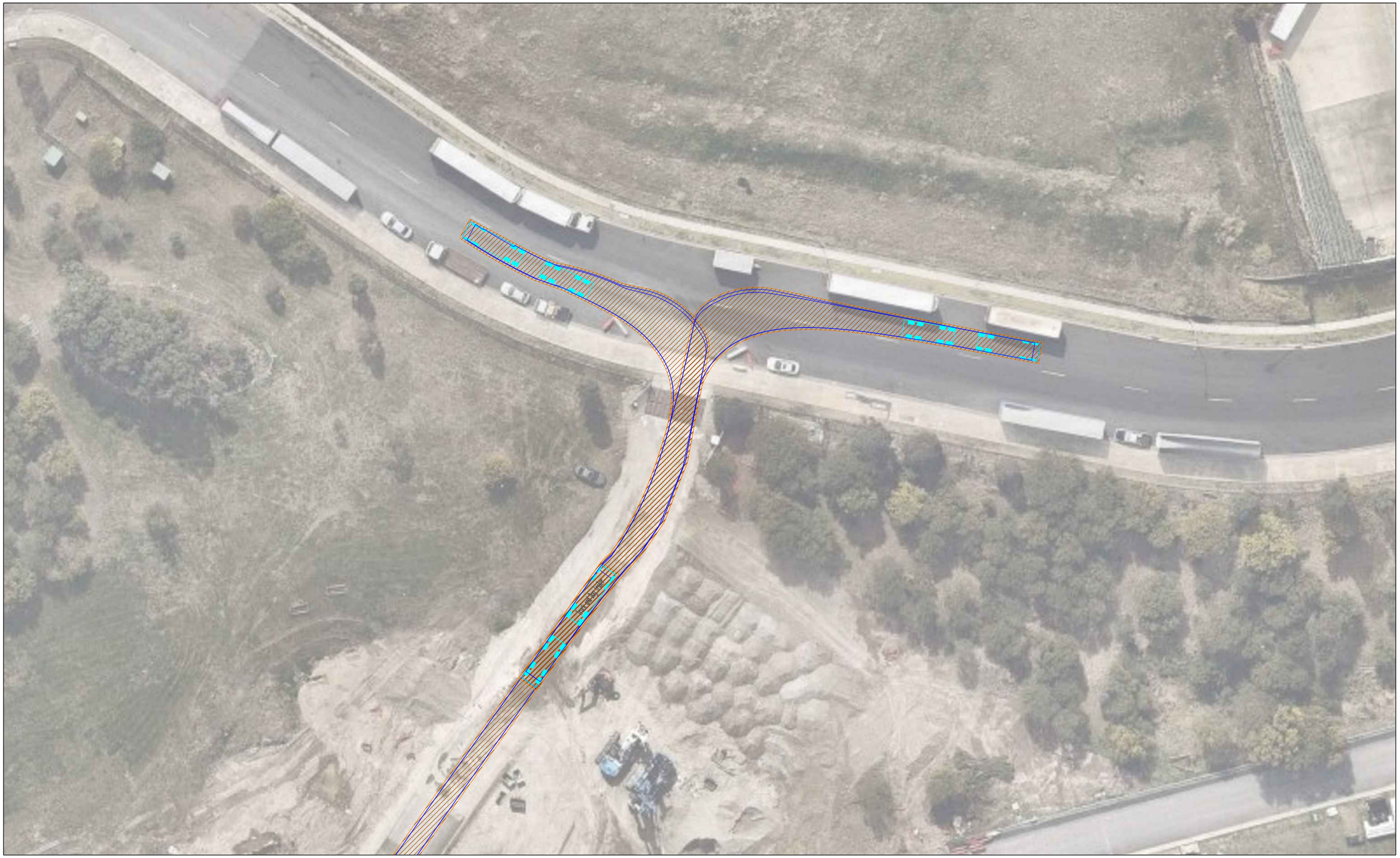
Drawing Title: 19.6m Truck & Dog Entry

Date: 30/10/2019

Scale @ A3: 1:500

Drawing Number: 01

asongroup
Suite 5.02, Level 5, 1 Castlereagh Street
Sydney NSW 2000
info@asongroup.com.au



Revision notes:

Rev:	Date:	Notes:

For information purposes only - not for construction

Drawn By: VC

Client: CDC

Project: 1027 17 Roberts Road, Eastern Creek

Drawing Title: 19.6m Truck & Dog Exit

Date: 30/10/2019

Scale @ A3: 1:500

Drawing Number: 02

asongroup
Suite 5.02, Level 5, 1 Castlereagh Street
Sydney NSW 2000
info@asongroup.com.au

Appendix B

www.invarion.com

commercial TC PTY LTD

Drawn By : Aleksandra Moisejenkova
Licence Num: 0051855538

TRAFFIC CONTROL PLAN

DATE: 25/05/2020

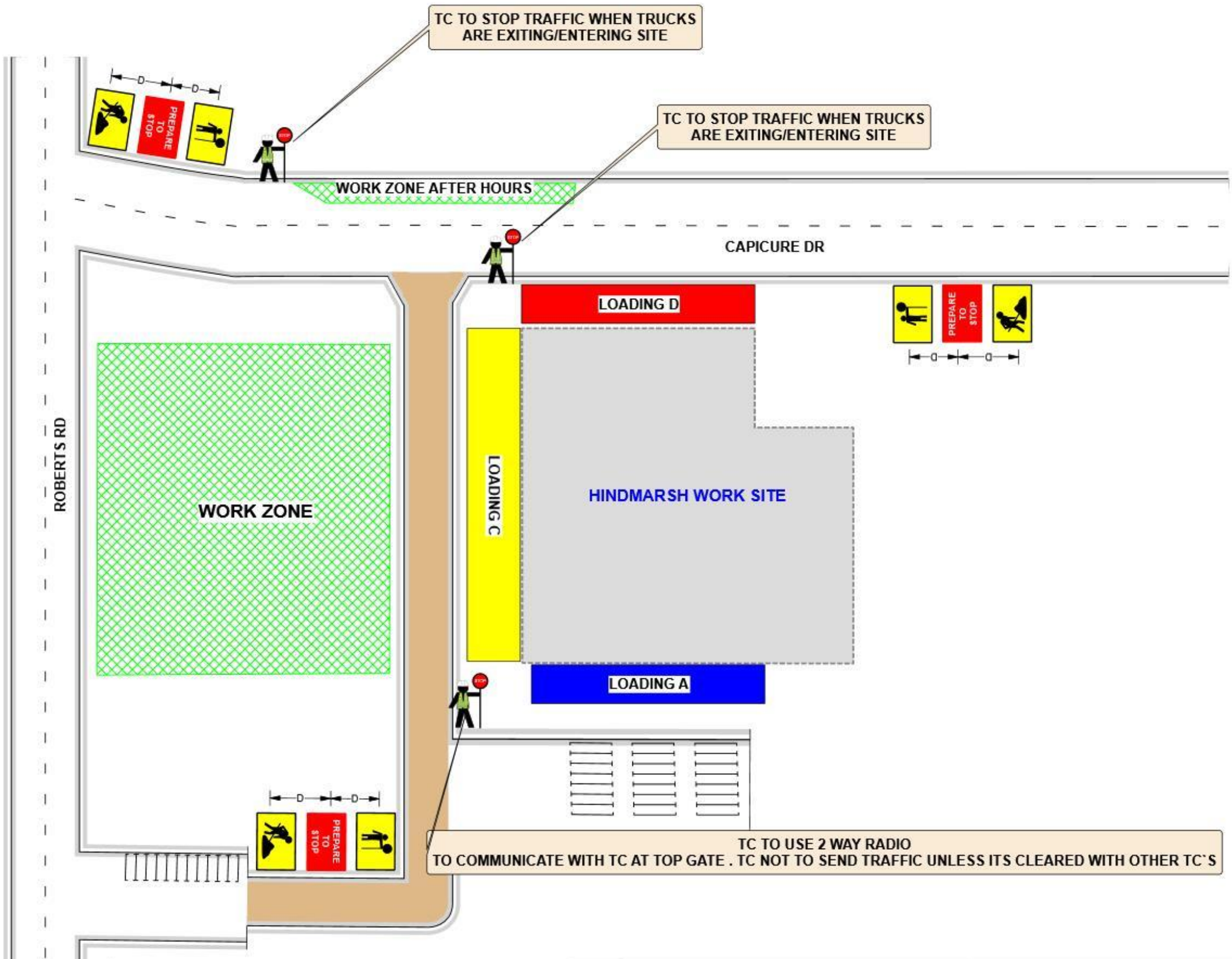
LOCATION / CUSTOMER: ROBERTS DRIVE , EASTERN CREEK

NAME: Aleksandra Moisejenkova
Licence No: 0051855538

TCP No.: TRUCKS ENTERINGEXITING SITE

This traffic control plan is drawn to AS1742.3 and the R.T.A worksite manual for traffic control at worksites,it is to be implemented as such .This traffic plan is a GUIDE ONLY and can be altered on site but must be signed by an R.T.A accredited person.
Approach speeds = up to 60km
daylight- class1 signs to be used
all personal to wear HI Vis Clothing
vehicles to park within the worksite
R.T.A certified traffic controllers to be employed.

N W E S



Date: 25/05/2020 Author: Aleksandra Moisejenkova Ticket: 0051855538
Address: ROBERTS RD , EASTERN CREEK Client: HINDMARSH TCP: 01
TC'S REQUIRED: 4 OPERATION: WORK ZONE

Comments:

RMS Accredited Traffic Controllers will adhere to this TCP according to TCW Manual V5 and relevant SWMS.
Signs and Devices are to be placed in accordance with this TCP, Modification may be made by persons holding a RMS "Design and Audit" Qualification only.
All signs and devices used must comply with Australian Standards AS1742.3

TCP MODIFIED BY:_____
TICKET:_____
DATE MODIFIED:_____

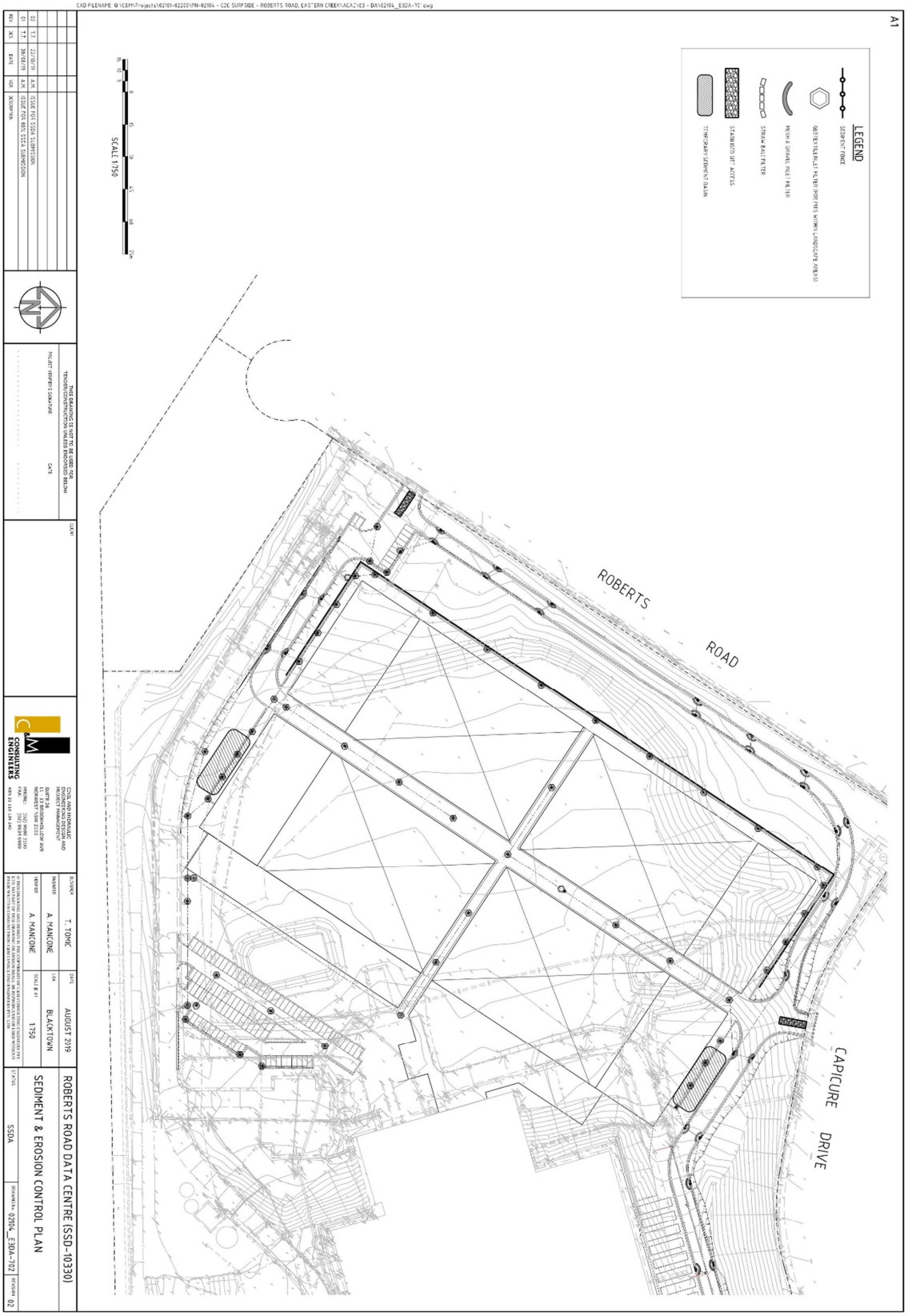
TABLE 4.2
VALUE OF DIMENSION *D*

Speed of traffic km/h	Dimension *D* m
45 or less	0 to 5
46 to 55	15
56 to 65	45
Greater than 65	Equal to speed of traffic, in km/h

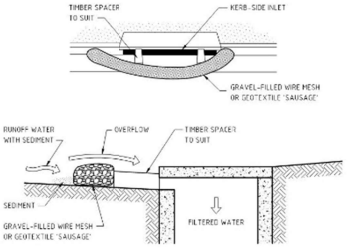
Dm [Speed Limit]	Merge Taper Length	Laterial Taper Length	Buffer Length
45 or Less	15		30
46 to 55	30	15	30
56 to 65	60	30	30
66 to 75	115	70	30
76 to 85	130	80	40
86 to 95	145	90	40
96 to 105	160	100	50
Greater Than 105	180	110	50

Based on As 1742.3 - 2009

APPENDIX O:
SEDIMENT EROSION CONTROL PLAN



A1

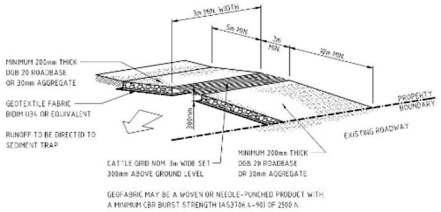


CONSTRUCTION NOTES:

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

MESH AND GRAVEL INLET FILTER DETAIL

NOT TO SCALE



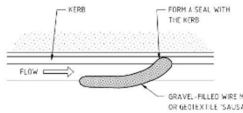
GEOFABRIC MAY BE A WOVEN OR NEEDLE-PUNCHED PRODUCT WITH A MINIMUM CBR BURST STRENGTH (AS3706.4-90) OF 2500 N.

CONSTRUCTION NOTES:

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

STABILISED SITE ACCESS WITH SHAKER GRID DETAIL

NOT TO SCALE

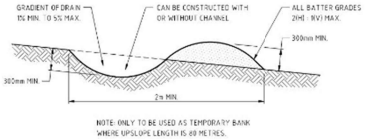


CONSTRUCTION NOTES:

1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH APPROXIMATELY 1.0m IN LENGTH AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE KERB.
4. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

MESH AND GRAVEL KERB FILTER DETAIL

NOT TO SCALE



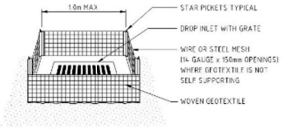
NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE UPSLOPE LENGTH IS 60 METRES.

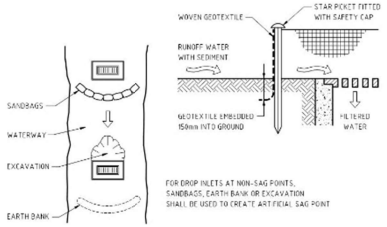
CONSTRUCTION NOTES:

1. BUILD WITH GRADIENTS BETWEEN 1% AND 5%.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE – WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS, NOT V SHAPED.
5. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.

TEMPORARY DIVERSION CHANNEL (LOW FLOW)

NOT TO SCALE





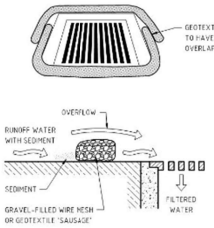
FOR DROP INLETS AT NON-SAG POINTS, SANDBAGS, EARTH BANK OR EXCAVATION SHALL BE USED TO CREATE ARTIFICIAL SAG POINT

CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
3. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER DETAIL
FOR PITS WITHIN LANDSCAPED AREAS

NOT TO SCALE

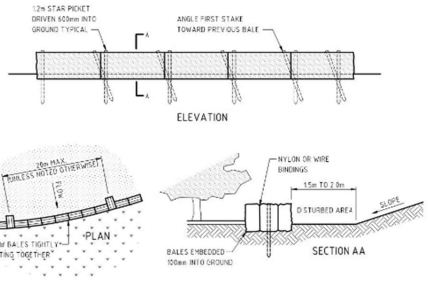


CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER DETAIL
FOR PITS WITHIN PAVEMENT AREAS

NOT TO SCALE

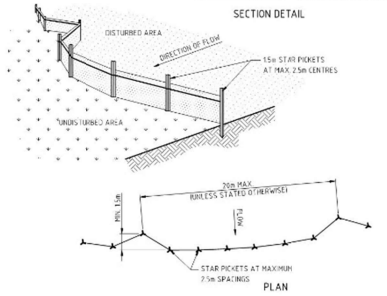


CONSTRUCTION NOTES:

1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO GROUND.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 1.2m STAR PICKETS OR STAKES, ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE THEM 600mm INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED AND THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1.0m TO 2.0m DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAMME THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED – THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

STRAW BALE FILTER DETAIL

NOT TO SCALE



CONSTRUCTION NOTES:

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

SEDIMENT FENCE DETAIL

NOT TO SCALE

REV.	DES.	DATE	VER.	DESCRIPTION
02	T.T.	22/10/19	A.M.	ISSUE FOR SSDA SUBMISSION
01	T.T.	30/08/19	A.M.	ISSUE FOR 80% SSDA SUBMISSION

THIS DRAWING IS NOT TO BE USED FOR TENDER/CONSTRUCTION UNLESS ENDORSED BELOW

PROJECT VERIFIER'S SIGNATURE: . . . . . DATE: . . . . . .

CLIENT

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DRAWN	A. MANCONE
VERIFIER	A. MANCONE
DATE	AUGUST 2019
LGA	BLACKTOWN
SCALE @ A1	AS NOTED

ROBERTS ROAD DATA CENTRE (SSD-10330)

SEDIMENT & EROSION CONTROL DETAILS

STATUS: SSDA | DRAWING No. 02104_E3DA-701 | REVISION 02

CAD FILE PATH: G:\C&M\Projects\18281-32260\PLN-32104 - CDC SUPPORT - ROBERTS ROAD, EASTERN CREEK (AEA)\01 - SSDA\02104_E3DA-701.dwg

Doc. No: C-PRE-M005 Rev. No: 05

Construction Environmental Management & Sustainability Plan (CEMP)