

PEOPLE WHO BUILD



CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)



PROJECT NAME

**TAFE NSW INSTITUTE OF APPLIED
TECHNOLOGY FOR CONSTRUCTION**

PROJECT NO

3547

1 DOCUMENT PROPERTIES

Plan Title	Environmental Management Plan
Parent Plan	Construction Traffic & Management Plan
Sub Plans	<ul style="list-style-type: none"> / Noise and vibration (including monitoring) / Asbestos management (and unexpected finds procedure) / Sediment and erosion control / Water management including discharge consents / Waste Management Plan
Referenced Plans	Community & Stakeholder Engagement Plan Ecologically Sustainable Development (ESD) Plan
Document Owner	Project Manager

Plan Control and Amendment

The current reviewed and approved version of this Management Plan is available electronically for all project personnel to access. Downloaded Management Plans are deemed uncontrolled and it is the responsibility of the user to ensure they are using the latest revision.

The document owner is responsible for maintenance, review, update and approval of this Management Plan. All changes to this document are noted below.

VERSION CONTROL

Rev. No.	Issue Date	Approved By	Position	Details
01	18/10/21	Dean Israel	Construction Manager	Draft for Tender
02	18/10/21	Kieran Hill	Project Engineer	Contract Award Issue
03	01/12/21	Pierce Brennan	Project Manager	CEMP Submission to Certifier and Planning Authority
04	23/02/22	Pierce Brennan	Project Manager	Updated Personnel- R&R's adjusted
05	17/08/22	Pierce Brennan	Project Manager	Update Personnel, Update TMP

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APPENDIX 2- UNEXPECTED FINDS- CONTAMINATION AND HERITAGE FINDS PROTOCOL- SUB PLAN

APPENDIX 3- CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT SUB PLAN

APPENDIX 4- CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB PLAN

APPENDIX 5- CONSTRUCTION WASTE MANAGEMENT SUB PLAN

APPENDIX 6- CONSTRUCTION SOIL AND WATER MANAGEMENT SUB PLAN

4 INTRODUCTION / PURPOSE

This Environmental Management Plan (EMP) has been prepared to detail the processes and measures that will be implemented by ADCO to manage the safety requirements for the project.

Our HSE (Health, Safety and Environmental) Management System, documents the manner in which construction-related activities are required to be completed on the ADCO project sites. This Management Plan provides information on how workplace health and safety will be managed on this project to provide a safe, injury and incident free workplace for workers and the general community. It establishes clear objectives and targets and provides mechanisms to regularly measure performance through inspections, observations and audits appropriate to the level of risk.

System documents which are referenced in this Plan or any associated Plan or Risk Register can be sourced by accessing the ADCO Hub (ADCO personnel only). Additional information can be obtained from the HSE Manager.

ADCO project personnel will be inducted into the requirements of this Plan and any associated Plan or Risk Register by the Project Manager. Evidence of induction and discussion will be recorded within section ADCO Project Personnel Consultation and Sign off.

This document will be reviewed on a periodic basis, not exceeding 6-monthly, to ensure its compliance to legislative and operational requirements. Review and updates to this plan will initiate a change to the plan revision number and be recorded in the "Version History" section of the document. Superseded Plans will be marked as such and will be located within the Management Plan Folder located in the Site Office or electronically. Amendments to the Plan are noted in the "Document Properties section.

This Plan and any associated Plan or Risk Register (including any future revisions) will be supplied to subcontractors for review through the Aconex portal or another approved format.

Copies of this and superseded Project Management Plans and associated Risk Registers will also be maintained (archived) by ADCO for a period of at least 24 months following an update completion.

5 PRINCIPAL CONTRACTORS DETAILS

Name	State Address		ABN
ADCO Constructions Pty Ltd	Address	Level 2/7-9 West St	46 001 044 391 094 531 272
ADCO Group Pty Limited	Suburb	North Sydney, 2060	
	State	New South Wales	
	Phone	(02) 8437 5000	
ADCO Constructions 24 Hour Contact- Pierce Brennan 0419 422 566			

6 PROJECT INFORMATION

Project Description

The TAFE NSW IATC will comprise a 3 level construction (lower ground, Upper ground & level 1) with internal workshops, café, learning areas, amenities, storage in the lower ground, Amenities, industry engagement and staff kitchen in the upper ground and level 1.

The development includes an additional carpark and provides services for a projected 3500 student enrolment, encompassing various construction disciplines.

The project is on an existing field of the NSW TAFE Nepean campus, adjacent to the WSU Werrington South Campus.

Project Address

12-44 O'Connell St, Kingswood 2747

Project Manager

Ernst and Young

Client

TAFE NSW

Certifier

Philip Chun and Associates

Project Period

October 21 – April 2023

Separable Portions

N/A

7 SITE REQUIREMENTS

Site Access

Within Western Sydney Campus 12-44 O'Connell St, Kingswood 2747

Work Hours

7am-6pm Monday-Friday

8am-4pm Saturday

No working Sundays and public holidays

8 LEADERSHIP

8.1 ENVIRONMENTAL POLICY

ENVIRONMENTAL MANAGEMENT POLICY



ADCO is committed to performing its business activities in an environmentally responsible and ecologically sustainable manner.

This Environmental Policy sets out the basis of our commitment and portrays the manner in which we will conduct our activities.

Our principle objectives are to:

- Develop and implement environmental management procedures that continually improve performance, prevent pollution and realise opportunities which make a positive contribution to the environment.
- Make environmental issues an integral part of our planning and decision-making process and provide resources to implement our environmental programs.
- Promote and encourage the adoption of ecologically sustainable principles and operational methods within ADCO and also with our Clients, Subcontractors and Suppliers.
- Set and monitor key objectives of our environmental performance.
- Manage project operations in compliance with applicable legislation and Standards.
- Promote our environmental policy by communicating our performance to internal and external stakeholders.
- Provide training for employees and information to Subcontractors emphasising their responsibility for participation in environmental management programs.

Integrate environmental initiatives into our procedures for procurement of goods and services.

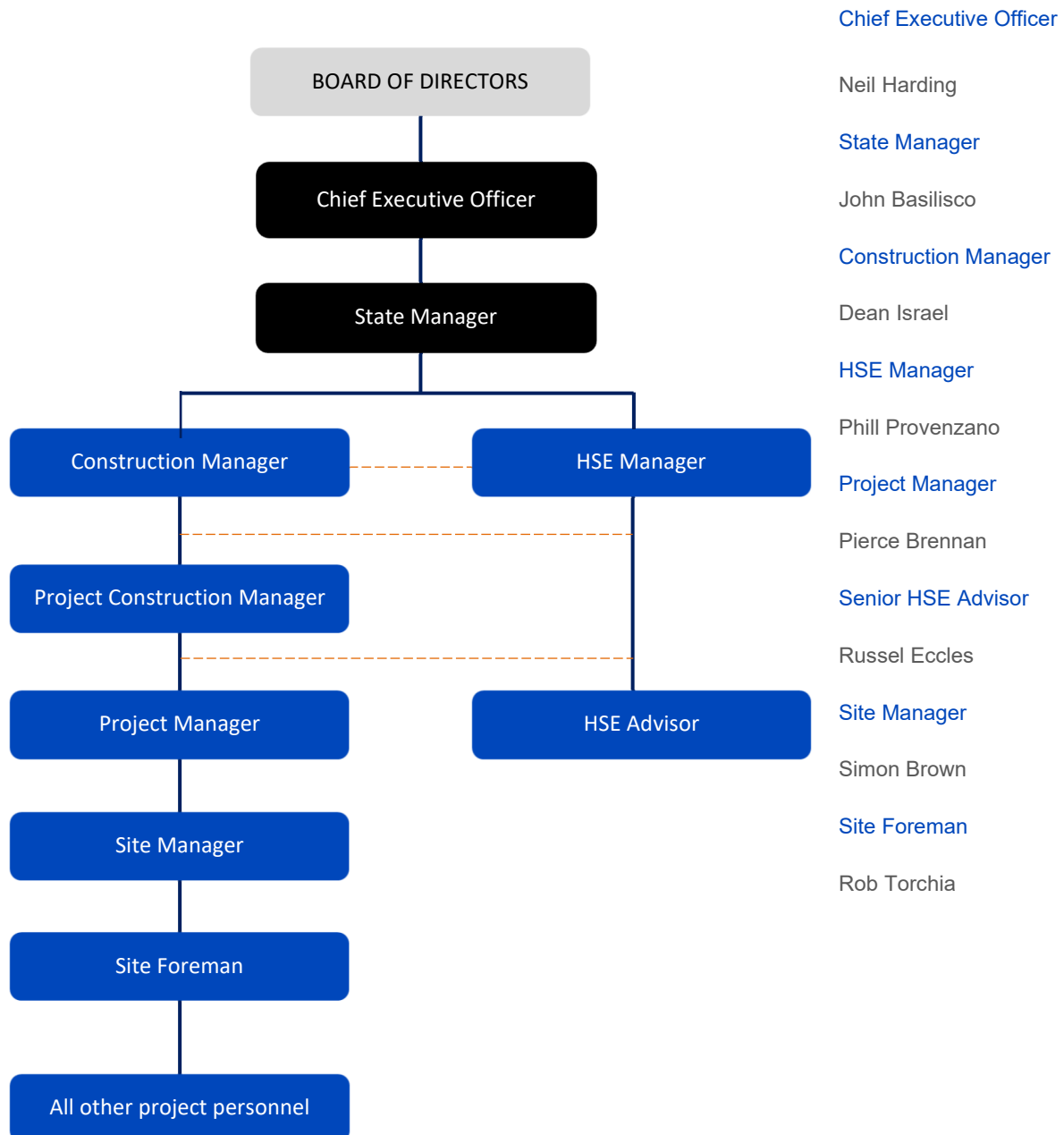
Our success is reliant on:

- Commitment to our philosophy, objectives and management systems by all employees.
- Participation in our management practices by external stakeholders.
- Commitment to comply with legal and other requirements to which the business subscribes.
- Continual improvement of our environmental performance against Key Objectives.
- Identification of opportunities to augment environmental and ecological sustainable practices on our projects.

DOCUMENT TITLE	ENVIRONMENTAL MANAGEMENT POLICY	DOCUMENT CREATED	26 FEBRUARY 2018
REVISION	1	DATE OF THIS REVISION	7 MAY 2019
		PAGE	1 of 1

8.2 PROJECT MANAGEMENT STRUCTURE

ADCO will provide a suitable and competent project team and associated subcontractors to effectively communicate and implement the requirements of the HSE management system.



8.3 ROLES AND RESPONSIBILITIES

Chief Executive Officer	<p>Provide commitment, leadership and direction in the development, implementation and management of the Corporate Management Systems, including but not limited to:</p> <ul style="list-style-type: none"> / Development of a corporate strategic plan incorporating safety, environment, quality and health management risks and controls. / An assessment of the effectiveness of the Corporate Management Systems. (e.g. review of incidents and non-conformances to identify non-conformance trends and areas of improvement to the Corporate Management Systems.) / Full management obligations including continual improvement of the Corporate Safety, Environment and Quality Management Systems. / Ensure that appropriate resources are allocated to ensure compliance legislative requirements and the requirements of the Corporate Management Systems. / Ensure that resources are competent to deliver the requirements of the Corporate Management Systems.
State Manager	<p>Ensure that:</p> <ul style="list-style-type: none"> / Corporate Management Systems are implemented at all levels in the State. / Appropriate resources are allocated to project teams to ensure compliance legislative requirements and the requirements of the Corporate Management Systems. / Project operations are in compliance with applicable state or federal legislation. / A review of the safety, environment, quality and health management performance of the State is completed regularly to identify non-conformances, trends and areas of improvement.
Construction Manager	<p>Ensure that:</p> <ul style="list-style-type: none"> / Corporate Management Systems are implemented on projects within the State. / HSE requirements have been identified and accounted for during project tender processes. / Project operations are in compliance with applicable state or federal legislation. / Appropriate resources are allocated to project teams to ensure compliance legislative requirements and the requirements of the Corporate Management Systems. / Project team personnel have received training to fulfil their duties and responsibilities with the Corporate Management Systems. / A review of the safety, environment, quality and health management performance of the State is completed regularly to identify non-conformances, trends and areas of improvement.
Health, Safety & Environment (HSE) Manager	<p>Ensure that:</p> <ul style="list-style-type: none"> / Legislative requirements for HSE management are implemented and maintained on project sites. / The requirements of the Corporate HSE Management System are implemented on project sites. / Where required, project HSE requirements and risks are identified during project tender and/or trade tender processes and incorporated into project management plans.

	<ul style="list-style-type: none"> / Reviews of HSE performance are completed on all projects to ensure compliance with legislative and corporate requirements.
Project Manager	<p>Ensure that:</p> <ul style="list-style-type: none"> / HSE requirements are identified and assessed during trade tender evaluations. / In conjunction with the HSE Manager, project management plans are developed and implemented on projects. / Resources are allocated to implement and maintain the HSE requirements on the project. / ADCO project personnel have received training to fulfil their HSE responsibilities. / Project personnel are aware of current HSE legislation and their obligations. / HSE performance on the project is reviewed and non-compliant activities by employees and subcontractors are addressed.
Site Manager	<p>Ensure that:</p> <ul style="list-style-type: none"> / Legislative requirements for HSE management are implemented and maintained on the project site. / The requirements of project HSE Management Plans are implemented and managed on the project. / The requirements of the Corporate Management Systems are implemented and managed on the project. / Any issues which may arise over HSE requirements (legislative or Corporate) are managed on site. / Employees and subcontractors complete their work in compliance with legislative and Corporate Management System requirements. / Open lines of communication and consultation are maintained with the HSE Advisor and other parties (i.e. subcontractors, employee representatives) to ensure that the site operates in a safe manner and in compliance with regulatory and corporate requirements. / HSE performance on the project is reviewed and non-compliant activities by employees and subcontractors are addressed.
HSE Advisor	<p>Ensure that:</p> <ul style="list-style-type: none"> / Legislative requirements for HSE management are implemented and maintained on project sites. / The requirements of the Corporate Management Systems are implemented on project sites. / HSE performance on the project is reviewed and non-compliant activities by employees and subcontractors are addressed.
Health and Safety Representative (HSR)	<p>In general:</p> <ul style="list-style-type: none"> / Participate in risk and hazard identification and control. / Participate in incident investigations and management. / Participate in workplace inspections (e.g. with the Committee, with the project team). / Participate in project consultative forums. (e.g. HSE Committee) / Consult with and represent workers (i.e. work group) in health and safety issues.

All Other Project Personnel

All personnel are responsible for actively promoting and complying with Safety, Health and Environmental Management requirements as determined / advised / required by ADCO. Activities that all personnel are required to participate in include, but are not limited to:

- / Attend pre-start meetings.
- / Conduct pre-start tasks analysis.
- / Adhere to all permit requirements.
- / Report all hazards, near misses and incidents (including injuries).
- / Immediately stop any “at risk behaviour” identified during daily work activities.
- / Attend safety presentations and toolbox meetings.
- / Assist in achieving project HSE objectives and targets.

9 PLANNING

9.1 MANAGEMENT SYSTEM

ADCO's Management System comprises, without limitation:

- / Policies
- / Procedures and Protocols
- / Project Management Plans
- / Supporting documentation
- / Forms and Checklists
- / Guidance documents
- / Reports and Reviews
- / Information systems

The Management System includes the disciplines of Quality, Safety and Environmental management which meet the requirements of:

- / AS/NZS ISO 9001 (Quality Management Systems)
- / AS/NZS 4801 (Occupational Health and Safety Management Systems)
- / AS/NZS ISO 14001 (Environmental Management Systems).

All personnel working with or for ADCO are required to incorporate the requirements of our Management System into their operational activities.

9.2 RISK MANAGEMENT

Risk management is a proactive process that helps ADCO respond to change and facilitate continuous improvement throughout our business. The core to effective risk management is having a comprehensive understanding of the risks associated with the project works.

The identification of environmental risks (aspects and impacts) will consider:

- / Situations / events that have the potential to give rise to injury or illness.
- / The nature of potential injury or illness relevant to the activity, product or service.
- / Past incidents, audit reports, etc.

The identification process will consider but not be limited to:

- / The way work is arranged, managed, completed.
- / The fabrication, installation and commissioning and handling and disposal (of materials, plant and equipment).
- / The purchasing of goods and services.
- / The inspection, maintenance, testing, repair and replacement of plant and equipment.

9.3 SAFETY IN DESIGN

Where ADCO does not have responsibility for the design of a building / component, a review of the buildability of the design will be completed any/all of the following: Design Manager, HSE Manager Project Manager, Estimator, Consultants, etc.

Where ADCO is able to influence design, a specific Safety in Design (SiD) process in accordance with the *Risk Management Procedure* will be carried out to ensure control of the design in regard to legislative requirements and to maximise the benefits of the design review process. The design review process will consider (where appropriate) the Hierarchy of Controls and look to eliminate risks at the design phase of the project. Safety hazards associated with design must be identified and managed with the aim to achieve successful identification of safety issues and other risks relevant to the design and the determination of measures to ensure fit for purpose and safe-operability requirements are achieved

SiD risk workshops involving the designers will evaluate the projects constructability and will be incorporated into the project risk register to ensure the identified risks and controls are in place for the project works.

9.4 PROJECT DOCUMENTATION

Prior to commencement of the project, the Project Manager and HSE Manager are required to develop the Project Management Plan, Risk Registers and any other supporting Plans. An assessment of project operating conditions will be made by completing the Project Review (Part A) – Commencement form. Information within the Risk Register will be supplied to subcontractors for trade pricing and development of their SWMS.

9.5 ASPECT AND IMPACT IDENTIFICATION AND REPORTING

ADCO encourages all site personnel to identify, report and action (where practicable and within their capacity to fix) hazards on the site whether within their work area or in any other accessed area. Risks or hazards, which cannot be actioned by the identifying person, must be reported to the Site Manager or HSE Advisor. The methods for reporting risks and hazards, include:

- / Verbal notification.
- / Advice at any of the consultative forums (e.g. pre-start meeting, committee meeting, subcontractor meeting).
- / Completion of the Issues Notification form.

Where a Site Manager or HSE Advisor is notified of a risk or hazard the following must occur:

- / The risk or hazard must be reviewed.
- / The risk or hazard should be assessed, and appropriate controls developed according to the principles of the hierarchy of controls.

Risk and hazards will be identified by the ADCO project team through performance evaluation activities.

9.6 LEGAL AND OTHER REQUIREMENTS

Legislation

ADCO's Management System has been developed taking into account Legislative, Australian Standards, Codes of Practice and Federal Safety Commission requirements. Legislation, Codes of Practice and Standards which are applicable to the project are identified in the project Risk Register. Access to current Legislation, Codes of Practice and Standards is available to all project personnel. Subcontract workers should liaise with the Site Manager or HSE Advisor for access through IT Forums.

Site Rules

Site Rules are applicable to all workers on this project and are:

- / Issued during the Workers Registration
- / Discussed during the Site Induction.
- / Discussed during the Visitor Induction.
- / Posted on site noticeboards – for review while on site.
- / Re-iterated as required during project consultative forums.

The objectives of the Site Rules are to:

- / Meet legislative requirement for OHS and environmental management.
- / Define ADCO's minimum operational standards.
- / Prevent harm to people and the environment.
- / Provide a safe working environment.

Conduct on Site

All persons entering the site are required to:

- / Wear clothing such as shirts, shorts, trousers, etc. in a neat and tidy condition at all times. (No singlets, sleeveless shirts or inappropriate shorts permitted).
- / Comply with site rules and procedures.
- / Observe restraint in the use of inappropriate language.
- / Not use amenities except those expressly provided for construction personnel.
- / Not bully or victimise any worker or management personnel.
- / Not use amenities except those expressly provided for construction personnel.
- / Report hazards and incidents immediately.
- / Ensure that work area/s are kept fenced to not permit public access.
- / Wear identification at all times. (e.g. Site Induction sticker).
- / Wear the mandatory signed PPE at all times.
- / Feel free to discuss any issues troubling you with our HSE Advisor or Site Manager (confidentiality will apply).

10 SUPPORT

10.1 TRAINING AND COMPETENCY

10.1.1 Training Needs Analysis

ADCO has undertaken a Training Need Analysis that identifies relevant training and competencies to undertake work activities. ADCO will communicate training and competency expectations throughout the procurement process to ensure the required skill levels of workers is understood and established.

ADCO will maintain a project induction / training register through its online HSE Management System HammerTech which will capture worker licences and competencies required to carry out works on the project.

Course / Competency Description	Position	Date to be completed by	Provider
Project Specific Induction	All workers	Prior to commencement onsite	Site Manager / Site Supervisor / HSE Advisor.
Toolbox Talk – Environmental Awareness	All workers	As required	Site Manager / Site Supervisor / HSE Advisor.
National High Risk Work Licence	Those who hold National High Risk Work Licence	Prior to commencing high-risk work	Accredited Training Provider
Plant*- Certificate of Competency for specific item of plant <i>*High-Risk Work licence is not available.</i>	Operators	Prior to operating plant	Accredited Training Provider
First Aid Training	First Aiders	Prior to start	Accredited Training Provider
Emergency Warden	Emergency Wardens	Prior to start	Accredited Training Provider
Work at Heights	Persons working at height	Prior to start	Accredited Training Provider
Confined Space Entry	Persons requiring entry and work in confined spaces	Prior to start	Accredited Training Provider
Occupational Health and Safety Representative Training	Nominated Representatives under State legislation	As required	Accredited Training Provider
Cert IV Workplace Health and Safety- <i>minimum</i>	HSE Advisor	Prior to commencement onsite	Accredited Training Provider

Course / Competency Description	Position	Date to be completed by	Provider
Asbestos Management	Relevant trades	As required	Accredited Training Provider

10.1.2 Project Specific Induction

Training and instruction are key requirements to ensuring that workers can perform their duties and tasks without risk to their health and safety or the health and safety of any other persons.

Project Induction

The ADCO induction process is a prescribed method of ensuring that workers are provided with information on:

- / Environmental Management Plan – purpose and objectives
- / Legal requirements
- / Environmental Responsibilities
- / Vegetation and fauna management requirements.
- / Environmental monitoring and data reporting requirements.
- / ASS, groundwater, dewatering and contaminated land management requirements.
- / Aboriginal heritage and Aboriginal heritage management requirements.
- / Hazardous Materials and hydrocarbon management requirements.
- / Waste management requirements.
- / Weed and hygiene requirements.
- / Inspection and audit requirements
- / Environmental emergency / spill response and incident management and reporting.
- / Unexpected finds management.
- / Sensitive areas including local residents, sites known of contamination, flora and fauna.

All persons who are attending the site for the purpose of completing construction activities must attend and complete the site induction (including the supply of skills competency evidence) before commencing any work activity on the site.

The project induction consists of an ADCO animated video with voice over which details the ADCO requirements for carrying out works on the project. Following the ADCO induction a project specific induction consisting of a PowerPoint presentation with voice over will be delivered by the ADCO Site Manager or HSE Advisor will incorporate project specific requirements.

Visitors

Visitors will not be site inducted and will be required to:

- / Report to the Site Office on entry and at exit from the site.
- / Sign in to and out of the Register – Visitors.
- / Be accompanied and remain within two metres of a site inducted person at all times.
- / Wear mandatory PPE as signposted.
- / Wear footwear and clothing appropriate to a construction site.

Records Induction information, including supporting documentation, will be maintained on site in a restricted storage facility, by the Site Manager and/or HSE Advisor or online HSE Management system.

Site induction information will be archived for a period of at least seven (7) years after completion of the project.

10.1.3 Training

ADCO Personnel Training and competency requirements for ADCO personnel (mandatory and recommended) are noted in:

- / Position Descriptions
- / ADCO National Training Matrix

State Managers, Construction Manager and Project Managers must ensure that project personnel are trained and competent in accordance with the requirements noted in these documents. Information related to completed training will be maintained on and filed with the National Skills Register.

Subcontractors Subcontractors are required to ensure that their personnel are in possession of the required licenses / competencies and have undergone training/ instruction to complete work activities in a safe manner.

The required licence / competency to undertake work is to be in accordance with applicable *Risk Management* or *Operational Management Procedure*.

Evidence of mandatory work activity competency (e.g. high-risk work license, certificates of competency, etc.) must be provided to ADCO at the time of site induction. Evidence supplied to and approved by ADCO will be included with the worker's induction records.

10.2 COMMUNICATION AND CONSULTATION

Pre Start Meetings A daily Pre Start Meeting to identify and discuss safety issues / hazards / controls relative to daily work activities will be held by the Site Manager. Subcontract personnel (i.e. Supervisors) are required to attend the briefings prior to commencing their work activities and conduct pre-work briefings with their respective crews.

Issues to be discussed at the meeting, include but are not limited to:

- / The tasks being completed by each trade during the shift.
- / Risk and hazard management requirements including the requirement for any Permits.
- / Incidents, accidents and near misses from any previous shifts.
- / Health and safety issues raised by the workforce.
- / Opportunities for worker input.

Details of the meetings (attendees, topics discussed, concerns arising, proposed actions) will be recorded on the Pre-Start Meeting form.

Toolbox Talks

On a weekly basis (edit frequency as required) or at the initiation of ADCO (e.g. following an incident), or at the request of workers, topic-based Toolbox Meetings will be held on the project. The objectives of toolbox meetings are to:

- / Review the environmental performance in the work areas.
- / Discuss any topical or promotional environmental items, bulletins or alerts.
- / Discuss environmental aspects of work planned for the next week.
- / Discuss any proposed changes to work procedures.
- / Provide additional instruction to workers on quality, work health and safety and environment issues.
- / Allow workers to raise issues.

Details of the discussion topic will be recorded on the Toolbox form. Toolbox Meeting Minutes will be displayed on Site Notice Boards for project personnel to review.

HS Committee Meetings

At the initiation of ADCO or at the request of workers, a Health and Safety Committee (HSC) may be established on the project. All subcontract companies are required to ensure that a representative (elected or nominated) participates if requested by ADCO.

Details of the meetings (attendees, topics discussed, concerns arising, proposed actions) will be recorded on the HSE Meeting form. Copies of the meeting minutes will be issued to all committee members and placed on the site noticeboard for general site review.

Other Meetings

Other forums which may be used for the discussion of safety, health and environmental management issues include, but are not limited to:

- / Subcontractor coordination and management meetings.
- / Client meetings.
- / Stakeholder Meetings.

Details of the meetings (attendees, topics discussed, concerns arising, proposed actions) will be recorded on an applicable form and as required distributed to other parties.

Notification

Details of the dates and times of consultative forums will be advised to site workers at/on:

- / Site Induction
- / Pre Start Meetings
- / Site Notice Boards

Notices – Alerts, Lessons Learnt and Bulletins.

Notices will serve as a reminder to workers of the messages that have already been delivered via project consultative forums. They will not serve as the primary method of work health and safety communication. Work health and safety notices will be posted on Site Notice Boards, located external to site offices and within amenity areas or other highly frequented areas and can include information such as:

- / Company Environmental policies
- / Cultural heritage
- / Protected flora and fauna
- / Restricted Areas / Site Sensitivity Maps
- / Site Traffic Movement Plan

Notice Boards will be updated and maintained by the Site Manager and HSE Advisor.

Communication and Consultation across languages

In accordance with procedure *Consultation and Communication* ADCO has a process in place to ensure that communication and consultation occurs with all workers, including those with limited English. This includes:

- / Assessing the language profile of the workforce.
- / Delivery of project inductions.
- / Subcontractors responsible for communicating and consulting with workers with limited English that includes use of translators and interpreters, diagrams and drawings, health and safety signage and allocation of resources for training, interpreters or translation of health and safety information.

11 DELIVERY

11.1 PROCUREMENT AND CONTRACT MANAGEMENT

11.1.1 Environmental in Procurement

Procurement Process

Prior to commencing any construction works and during the Procurement Process, ADCO will identify and list subcontractors / suppliers with capability to carry out the works. The suitability of subcontractors and suppliers (new and existing) will be assessed against:

- / Their company profile, expertise and previous history;
- / Internal recommendations of capability and reputation;
- / Location and proximity to the project site;
- / Their commercial and financial viability;
- / Their compliance to regulatory / legislative requirements;
- / Western Australian industry participation;
- / Compliance with requirements to issue a full, fair and reasonable opportunity on the supply requirements for the project;
- / New and retained apprentices and trainees;
- / Construction methodology;
- / Proposed personnel;
- / Project resourcing;
- / Adherence to ADCO management plans;
- / Quality management;
- / Ability to meet project timeframes;
- / Cost of money for payment terms;
- / Occupational health and safety; and
- / Risk profile.

ADCO's HSE standards are required to be adopted and maintained throughout the life of the project. Prior to work on site, subcontractors require a briefing to ensure that all work health and safety precautions are in place and to review:

- / How compliance with the Safety Management System will be achieved including site specific requirements.
- / How they intend to comply with ADCO's systems.
- / Documentation outlining their safe methods of work.
- / Establishing performance monitoring, supervision and incident reporting protocols, and procedures.

ADCO and Subcontractors procuring plant, equipment and items to be used throughout project delivery are to review and inspect all items to ensure that no additional hazards / risks are unknowingly introduced on the project.

When materials are supplied to the Project, the project team member responsible for the procurement is to ensure all work health and safety information has been included and is distributed to the workers identified as needing to understand the requirements.

Products and Materials

Products and materials are subject to verification by the Site Manager at the time of purchase and/or at delivery to ensure conformance to contract requirements.

Goods delivered to the site, may be subject to a receiving inspection by ADCO or the subcontractor representative who takes delivery. Should it be required within the Inspection and Test Plan (ITP), evidence of review and acceptance (i.e. manufacturing certificates, standards verification, origin of supply, etc.) will be held in the project site office for the duration of the project. At project completion, such documentation will be collated with "As Built" documentation or archived.

The Site Manager will be responsible for reviewing any Inspection and Test documentation required from and/or generated by the subcontractor in verification that their products and materials meet the requirements of the contract. Subcontractors must ensure goods are stored in designated areas and in accordance with the manufacturer's requirements.

Non-conforming products will be labelled and segregated from conforming products and will be subject to the Non-conformance management process.

11.1.2 Subcontractor Management

Safe Work Method Statements

Prior to the commencement of ALL work activities including High Risk Works (as defined in the OSH legislative requirements) must provide Safe Work Method Statements (SWMS) to ADCO for review and acceptance.

The review and acceptance process is managed by the Site Manager and HSE Advisor. The Safe Work Method Statement Review Record form details the minimum requirements that must be detailed within SWMS documentation.

SWMS classified as High Risk under legislative requirements will reviewed utilising the Safe Work Method Statement Review Record – High Risk. Work activities that are not 'High Risk' as defined by legislation will be reviewed utilising the Safe Work Method Statement Review Record – 'Low Risk'. Documents such as Procedures or Instructions are acceptable for Low Risk work activities.

- / A description of the work activity.
- / Details of Plant or substances to be used to complete the work activity.
- / Risks and controls measures for the work activity.
- / Environmental mitigation strategies for the work activity.
- / Emergency management procedures for high risk activities.
- / Details of who is responsible for managing the work activity and the controls.
- / Evidence that workers have been consulted in the production of the SWMS and provided instruction and training.

Works cannot commence until SWMS documentation has been accepted for use.

Plant and Equipment

Subcontractors are required to maintain Inspection and Test Records and Plant Registers for all plant and equipment procured by them (or under their control) to meet legislative or standard requirements. A competent person is to maintain documented daily inspections (or as per manufacturers' requirements) of the plant.

Copies of all plant documentation will be maintained on the online HSE Management System – HammerTech. The Equipment Register will provide prompts when plant and equipment is scheduled service or inspection.

- Monitoring** The monitoring of subcontractor site activity compliance to accepted SWMS will be:
- / Managed by the Site Manager and HSE Advisor through regular visual inspections.
 - / Documented on the Weekly Site Inspection Form.
- Non Compliance** Where a non-compliance (to accepted work methods) is observed, the Site Manager or HSE Advisor will do any/all of the following:
- / Stop the work activity.
 - / Cancel / suspended any active ATW Permit.
 - / Issue a non-compliance notice through Aconex or online HSE Management System.
 - / Issue a verbal instruction.
 - / Non-compliances will be listed in the Register – Non-Compliance or through Aconex.
- Where a worker does not comply with a risk or behaviour control requirement, disciplinary action through the ADCO non-conformance system will be initiated. Dependent on the severity of the non-compliance, workers are subject to a tiered warning system and may receive up to 3 warnings for engaging in the same non-compliant activity.
- Written warnings in the form of an Improvement Notice are issued to a company, when an individual of that company has engaged in a non-compliant activity.
- ADCO reserves the right to deny a person access to site – irrespective of the number of warnings required / issued – if the non-compliance could / has resulted in a dangerous occurrence. This determination will be made in consultation with Construction Manager, Project Manager, Site Manager and HSE Manager.
- Non-conformances identified through visual inspections, site inspections or task observations are documented within Register – Non- Conformances and is accessible to the ADCO project team.
- Archiving** Subcontractor supplied documentation will be archived by ADCO for a period no less than seven (7) years after project completion. Duration of archiving may be extended if the Safe Work Method Statement is applicable to an incident or in relation to use of hazardous substances etc.

11.3 SYSTEMS OF WORK

11.3.1 Waste management

- Waste sources** Identified sources of waste generated from project delivery include:
- / Metal.
 - / Concrete / sand.
 - / Wood.
 - / Plasterboard.
 - / Excavated Material (if soil has been classified as contaminated)
 - / Organic.
 - / Glass
 - / Plastic

	<ul style="list-style-type: none"> / Paper and cardboard / Polystyrene
Waste Management	<p>A form of waste minimisation, recycling and reuse program is established and promoted throughout the project period. Where waste minimisation is a requirement of project compliance (e.g. green star), waste strategies are included in the site induction program.</p> <p>Waste categories on the project will consist of solid waste, liquid waste, food waste and contaminated waste (if applicable). Waste management of the project will consist of single stream or co-mingled bins to collect waste material. All waste (excluding hazardous waste) will be transported to an offsite facility for disposal. The project will manage waste by:</p> <ul style="list-style-type: none"> / Designating waste storage areas. / Recycling waste products wherever possible. / Waste storage areas will be located in accessible areas for both vehicles and personnel to allow for easy access for collection and transport. / Waste bins will be maintained in good condition to prevent leaks and spills. / Defective containers will not be used for waste storage or transport. / Hazardous waste (e.g. asbestos) will be contained and separated from other waste categories. Hazardous waste will be disposed of at an approved waste disposal facility and evidence of disposal i.e. waste disposal dockets obtained. / Establishment of a designated concrete wash out area. Where practicable excess concrete will be recycled onsite for use e.g. access and egress routes or stabilise fill material. / If applicable – Material contaminated by spills i.e. fuel, oil, lubricants etc. will be stored in sealed containers and disposed of at an approved facility. / Actively encouraging Contractors and Suppliers to use non-toxic or recycled products and recycled packaging. / Encouraging Contractors and Suppliers to reduce the amount of packaging materials brought on to site. / Ensuring that all persons working on our projects are made aware of their responsibility for achieving a green working environment. / Any contaminated soil on the project will be classified prior to removal and transport directly to an approved disposal facility.
Food Waste	<ul style="list-style-type: none"> / Food waste will be managed to prevent birds and vermin accessing the waste. / Lidded food waste bins will be located in the site amenities areas i.e. offices / lunchrooms. / Designated food waste bins will be emptied on a daily basis. / Food waste bins are to be kept covered / Food waste will be contained in bags which will be secured / tied when emptied / Work areas are to be kept free of rubbish and other debris at all times. / No food waste to be deposited directly into external construction waste skips. / Active rodent control established on the site i.e. baits around site perimeter.
Housekeeping	<p>The Site Manager will ensure that Site Amenities i.e. crib rooms and toilet blocks are maintained in a clean and tidy condition at all times. All waste bins shall be covered and sealed and all organic waste shall be removed from site on a regular basis.</p> <p>Each Subcontractor must maintain a clean and tidy workspace. If after a formal warning, any Subcontractor who does not maintain their workspace in a clean and tidy manner and properly dispose of its waste, the Project Manager will arrange for the workspace to</p>

be cleaned and waste segregated to be properly disposed of with the associated costs back-charged to the non-compliant Subcontractor.

The Project Manager will ensure that an adequate number of waste bins have been provided and are located as close to areas of work as practicable for the material to be removed from the site by the subcontractor's waste removal contractor. All bins shall be covered by lids where available to prevent material from being dislodged during transport of storage.

Trucks and vehicles delivering goods, materials, plant, equipment, etc. must so far as practicable not traverse mud, dirt, stones or other materials to external areas of the site so as not to cause injury, nuisance or damage to the surrounding environment. Should surrounding roads, footpaths, watercourse and verges be soiled with dust, sand, grit, litter, debris, mud and the like caused by site activities, the Project Manager will undertake to have them cleaned immediately.

The site must be maintained in a clean and tidy condition at all times. A formal housekeeping inspection will be completed on a weekly basis by the project team utilising the Weekly Site Inspection form.

Waste Removal and Disposal

Removal and recycling of waste will be provided by a licenced waste removalist. Trucks removing material from site will have the loads securely covered to prevent spillage. Drivers are required to ensure that no materials are tracked onto the road.

Should surrounding roads, footpaths and verges be soiled with dust, sand, grit, litter, debris, mud and the like caused by site activities, the Project Manager will undertake to have them cleaned immediately e.g. road sweeper.

The transport of all materials from the site will comply with the requirements of the EPA, Local Councils, Road Transport Authorities (RTA) and other relevant authorities. Waste removed from site will be disposed of at an appropriately licenced waste disposal facility. On a monthly basis a Waste Management Report will be provided to ADCO which will detail quantities of waste that are recycled, reused or go to landfill.

11.3.2 Substance Management

Substance Use

ADCO will have appropriate measures in place to use and store hazardous substances / dangerous goods to prevent accidental or intentional release to the natural environment leading to environmental harm, including impacts to air and water. The following management protocols will be implemented and monitored for implementation on a daily basis:

- / Maintaining a limit of 250 litres of each substance on site at any one time. Note: Any requirement to use or store more than this quantity, requires an ATW Permit issued.
- / Subcontractors providing a site-specific SWMS detailing the work activities, risks and control measures. (No work will proceed until ADCO Constructions has accepted the SWMS).
- / Current SDS for each substance will be available for reference. SDSs are to be Australian and issued within the previous 5 years. SDS information will be located in the Site Office.

- / Current Register for such substances as used on the site. (The Register detailing the nature, quantity and location of all hazardous material must be maintained and regularly updated).
- / Ensuring that the substances and their containers are correctly labelled and contained.
- / Erection of appropriate warning/emergency panel signage to warn of the location of the substance.
- / Ensuring that the substances are safe from use or access by other parties.
- / Completing regular inspections of vehicles, containers, bunding and equipment to check for any leaks or spills.
- / Providing appropriate fire suppression equipment.
- / Providing details for ensuring that at the completion of the works, all residual stocks of substances are guaranteed to be removed from the construction area.

Substance Storage

Substances must be stored in accordance with Procedures – Substance Management. To ensure the protection of human health and the environment the following is to be implemented:

- / Storing the substances in a manner which complies with the Code (and with AS 1940, AS 4332 and any other applicable legislation or standards)
- / Storage units are only to be used outdoors.
- / Storage units are not to be located where they could hinder escape from a building in the event of a fire or other emergency;
- / Storage units are to be separated from boundaries and other buildings and infrastructure by the distances required by the relevant Australian Standard.
- / Storage units must be adequately secured against high wind conditions.
- / Storage units are to be positioned, or otherwise protected (e.g. with bollards) so that they are protected from vehicle impact.
- / If two or more storage units are positioned together, they can only be treated as individual stores if they are separated by the distance required by the relevant Australian Standards.
- / If two or more storage units are positioned together, they must not be positioned so that there is any restriction of ventilation through any of the installed vents.
- / The area around storage units is to be kept clear of combustible materials (e.g. timber pallets), vegetation and refuse for a distance of at least 3 metres.
- / Storage units are to be located at least 3 metres away from heat sources. Refer also to separation distance requirements outlined above.
- / Storage units for flammable and oxidizing materials are to be kept away from ignition sources. This includes electrical installations (such as power-points, light-switches and light-fittings), traffic routes, carparks, and work areas where ignition sources may be present (e.g. areas where welding or grinding may take place).
- / For gas cylinders in storage units, separate incompatible gas cylinders by at least 3 metres.
- / Bunds to be of sufficient size and capacity to accommodate substances stored in the event of a spill.
- / "DANGER" signage to be placed in visible positions to warn of dangers (flammable substances).
- / Fire suppression equipment to be located with the substances.
- / Incompatible goods are not to be stored in the same cabinet. Specific information for individual products can be found on the product Safety Data Sheet (SDS).

Spill management

Substances (chemicals and / or hydrocarbons) that leak into environment can lead to environmental and/or human harm. Equipment failure, poor operation or accidents can all give rise to the potential spills. Any spillage has the ability to impact soil, water, flora or fauna in an adverse manner.

To mitigate and control any unplanned event or spill, emergency spill kits will be strategically placed around the project and clearly defined on the Emergency Plan. Any spill, irrespective of size, must be reported to the ADCO project team who will investigate and implement appropriate risk treatments.

In the event of hydrocarbon contamination as a result of project activities, the affected area will be contained and cleaned up.

11.3.3 Dust Management

General

ADCO will prevent any nuisance occurring through the discharge of dust, dirt, water, fumes and the like on to persons or property. Strategies to be implemented to prevent dust generation and potential nuisance includes but is not limited to:

- / Restrict vehicle movements to designated routes.
- / Apply water sprays to earthwork and demolition locations as required during periods of dry weather, strong winds or dust generating activities.
- / Use shade cloth around work areas where practicable.
- / In the event that excavated materials will be stockpiled, onsite stockpile management practices will be carried out. These include water sprays and locating stockpiles away from public and residential properties as much as is reasonably practicable.
- / Minimise dust generating construction activities during periods of high winds or adverse weather.
- / Cease relevant construction activities should they be found to be generating excessive dust until effective control measures are implemented.
- / As required, implement regular sweeping (including road sweeping) and cleaning activities.
- / Monitor and manage the incidence of dust deposition from construction activities and construction vehicles.
- / Daily and Weekly visual monitoring of dust and dust management controls will be carried out by the Site team.
- / Ensure that subcontract personnel adopt work methods to include dust minimisation practices.
- / Implement corrective action in response to diminished air quality as a consequence of construction activities or vehicles.
- / Restrict construction traffic to designated / sign posted traffic routes.
- / No burning off will occur on the site.
- / Site amenities areas will have nil dust generating activities that will require additional dust management strategies in place.

Monitoring and recording

Where dust management controls are identified as being inadequate ADCO will investigate and identify the root cause and cease the dust generation activity until suitable controls have been implemented.

11.3.4 Construction Noise and Vibration Management

Management ADCO will comply with AS/NZS 2436 Guide to Noise Control on Construction, Maintenance and Demolition Sites. Works will be carried out during the approved working hours only and all noise generated through plant will be assessed through the plant mobilisation and induction process.

To ensure that plant and equipment used throughout construction is the quietest reasonably available ADCO will:

- / Ensure that Plant is inspected at first entry to site and then at regular intervals. Refer to Procedure: Operating Plant (mobile plant).
- / Where practicable, position Plant / equipment (e.g. start-up, parking, refuelling, generators) away from noise-sensitive areas.
- / Where practicable, avoid simultaneous operation of noisy Plant /or equipment.
- / Ensure that Plant / equipment is serviced as per the manufacturer's instruction and maintained in good working order.
- / Ensure that Plant / equipment is switched off when not in use.
- / Where practicable, select alternative Plant or equipment to complete the activity.

The ADCO Project team will ensure compliance to noise and vibration management controls through:

- / Communicate noise generating activities with key stakeholders.
- / Carrying out works within approved Construction Hours.
- / Regular inspections (documented in the Weekly Site Inspection) and completion of corrective actions where required.
- / Inclusion of noise and vibration awareness and control requirements through consultative forums.
- / The use of the daily Pre-Start Meeting to discuss awareness, control compliance and requirements.
- / Ensuring, so far as is practicable, that personnel involved in or working near noise generating activities on the construction site, wear PPE applicable to the activity.
- / Ensuring, that signage advising of the hazard/s are posted in visible locations around the work activity area.
- / Where construction activities may result in noise / vibration impacts Facility, notification will be provided to the affected parties.
- / The location of the works within the site will be considered and appropriate and suitable equipment will be selected based on the proximity to adjacent properties.

Monitoring and recording Noise and vibration monitoring will be installed at key positions on the site hoardings. Baseline levels will be established prior to works commencing, and alarm levels set. Data is available to all stakeholders via live online dashboard reporting.

Should a complaint be received regarding noise / vibration ADCO will investigate and identify the root cause and cease the noise / vibration generating activity

11.3.5 Stockpile Management

Management To prevent contamination of nearby watercourses and potential dust emissions which degrade air quality, ADCO will implement the following control measures:

- / Stockpiles will be located as far away from residential buildings as is practical.

- / Topsoil stockpiles to be located on flat areas, clear of drainage lines and at significant distance away from waterways, roads, and slopes of greater than 10%.
- / Stockpiles to be located at least 3 metres from tree drip lines.
- / Stockpiled materials not to be placed inside vegetation protection areas or within 5 metres of retained trees.
- / Stockpiled materials not to be placed within 5 metres of waterways or stormwater inlets.
- / Clean topsoil and friable subsoil to be stockpiled separately and re-spread in areas to be revegetated
- / Weed infested topsoil to be stockpiled separately and removed from site or re-spread in a manner which mitigates the spread or re-introduction of weeds.
- / Install bunding/silt fencing around stockpiles to prevent against water runoff.
- / Dampen stockpiles by means of water sprays to management dust emissions.
- / Where practicable, vegetate stockpiles to improve soil stability.
- / In the event that stockpiles are to remain for extended periods of time (>12 months) hydro mulch or similar may be required to ensure stabilisation.
- / Limit the height and volume of stockpiles so that control measures can be implemented.
- / Stockpiles and control measures to be monitored regularly and immediately rectified as required.

11.3.6 Sediment Control and Onsite Water Management

Management

Surface water management will be considered into the staging of the construction works program. Regular inspections of stormwater and surface water controls will be undertaken, and issue identification and corrective actions recorded on the online HSE Management System.

The risk of erosion and sedimentation is a direct consequence of exposure of soil to rainfall and stormwater runoff. Sedimentation involves the deposition of eroded material into surrounding areas.

To control the risk of erosion or sediment impacting on the natural environment, ADCO will:

- / Install erosion and sediment control devices to mitigate and manage the impact of excess soils on nearby roads, surface water quality, air quality, fauna and flora.
- / Erosion and sedimentation controls to be monitored on a weekly basis or immediately following a rainfall event.
- / Ensure that the handling and placement of excavated material is in accordance with WMS, Client instructions, EPA requirements etc.
- / Complete daily inspections of stockpiles, excavated areas and control methods for erosion and sediment management.
- / Residue to be disposed of in an appropriate manner.
- / All drainage inlets near or within the site must be protected against silt infiltration and soil run off with the use of silt traps, sandbags and/or geo-fabric protection.
- / ADCO Constructions will ensure that all drains and gutters leading to the storm water system within the Site have sediment control measures installed to prevent sediment entering into the drainage system and waterways.

Entering Site

- / Identify vulnerable locations on site and install control devices as far as practicable to halt or alter course of water.
- / Inspections prior to a major weather event.

- Exiting Site
- / Identify vulnerable drains, low points and stormwater runoff points.
 - / Install control devices (i.e. silt fencing, bunding, diversion devices, sandbags, etc).
 - / Daily inspections and maintenance of control

11.3.7 Materials Storage

General Construction material required to carry out project works will be stored within designated storage areas within the site compound. The capacity of bunds and containment areas will be maintained at all times. Where necessary bunds will be pumped out after rain events, water tested and disposed of appropriately.

Prior to any delivery of materials, mobile plant or tools, subcontractors to consult with ADCO Site Management on the following:

- / Permissible items permitted on site including DG/Hazardous Substances.
- / Storage areas for trades / materials / substances / Plant.
- / Permits or pre- entry inspections including documentation (e.g. Safety Data Sheets, Validation Certificates etc.) required for Plant, tools or substances.
- / Hazardous substances and flammable goods to be stored in an approved lockable storage cage. Subcontractors to provide their own lockable cages.
- / Pre- delivery inspections to ensure that materials are in accordance with SHE requirements.
- / Use of bunds and containment areas.
- / Items found not to be conforming are to be secured and removed from site.
- / Capacity of bunds and containment areas will be maintained. Where necessary bunds will be pumped out after rain events and disposed of appropriately.

11.3.8 Foreign Object Damage

Site Compound To manage the potential of Foreign Object Damage (FOD) within the site compound, ADCO will:

- / Area to be contained within perimeter fencing.
- / Appropriate storage containers based on the nature of the product being stored will be provided and located in a designated area.
- / Containers must be closed except for when personnel are accessing or working within the container.
- / Items within containers must be secured.
- / Waste must be placed into supplied receptacles fitted with lids.
- / Waste lids are to be closed at all times.
- / Material or equipment stored external to site sheds or containers must not have any fittings, fixtures or wrapping which could come loose and cause a hazard.

Work Areas To manage the potential of Foreign Object Damage (FOD) within project work areas, ADCO will:

- / Material or equipment transported to the work area must be secured to ensure that no fittings, fixtures or wrapping could come loose and cause a hazard during transportation
- / Work areas are to be maintained with a high standard of housekeeping at all times and must be free of loose material, packaging, debris etc. at the close of each shift.

11.3.9 Plant Movements

General

To ensure that no fuel, lubricant, mud, dirt, stones or other materials is spilled, or other materials is spilled or deposited onto roads or footpaths resulting in damage, loss, injury or nuisance ADCO will:

- / Install control measures (i.e. water spraying, rumble grids, road sweepers) which limit the opportunity for dust, noise or spillage to occur.
- / Limit site speed Limits.
- / Loads to be covered prior to leaving the site.
- / Daily inspections of control measures to be conducted and immediately rectified as required.
- / Work activity requirements to be included in the Site Induction.

Traffic Management / Movement

- / Comply with any approved Traffic Management Plan for external site traffic management.
- / Where practicable, co-ordinate deliveries and site activities with out of peak traffic hours.
- / Monitor traffic flows and implement corrective actions in response to traffic impacts as a consequence of construction activities.
- / Daily inspections of control measures to be conducted and immediately rectified as required.
- / Work activity requirements to be included in the Site Induction.
- / If required under planning, inform local community about the timing and scale of construction traffic impacts.

Roads and Footpaths

- / Protect footpaths, kerbs and roads from damage through (e.g.) use of metal plates, restriction of heavy vehicles, prohibition for storing equipment or material on roads and footpaths etc.
- / Daily inspections of control measures to be conducted and immediately rectified as required.
- / Work activity requirements to be included in the Site Induction.
- / Should surrounding roads, footpaths, watercourse and verges be soiled with dust, sand, grit, litter, debris, mud and the like caused by site activities, the Project Manager will undertake to have them cleaned immediately.

11.3.10 Refuelling

Management

The following management protocols will be implemented:

- / There will be limited storage of fuels onsite.
- / Refuelling is to occur in designated refuelling areas with preference for refuelling to be carried out by mobile fuel vehicles / trailers.
- / Fuels, oils and chemicals are to be stored in accordance with the relevant Standards and all appropriate measures taken to ensure that environmental performance is being fulfilled
- / Regular inspections of vehicles, containers and equipment to be completed to check for any leaks or spills.
- / Ensure that appropriate storage facilities and fire suppression, spill management is used.
- / Ensure that containers are correctly labelled and that minimal quantities are stored on site.
- / Where possible, request substitution of substance with less harmful substances.

- / Major servicing of machinery to be completed off site.
- / Hoses to be fitted with a stop valve
- / Spill response kit to be readily available during refuelling activities.

11.3.11 Heat

Management

Throughout project delivery ADCO will ensure that workers are aware and have the required controls to mitigate the risk associated with long periods of heat and direct sunlight impacting on workers. Controls include but are not limited to:

- / Enforcing frequent breaks including weekly toolbox talks.
- / Use of SPF 50 sunblock and reapplication at frequent periods.
- / Site PPE Standards.
- / Increase fluid intake & additional water bubblers located throughout site.
- / Scheduling most strenuous works to occur at cooler times of the day.
- / Substituting physical activities to machine where applicable to reduce physical demands.
- / Measure daily temperature and humidity and display on site notice boards.

11.3.12 Light

Management

Prior to works commencing onsite ADCO will identify sensitive areas that may be impacted by lighting. This includes stakeholder operations, surrounding residents and fauna. Lighting plants will be sited so as not to shine towards residential properties.

Design

External lighting shall be designed in compliance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting.

11.3.13 Flora and Fauna

Management

ADCO will not remove, damage or destroy, or cause to be removed, any trees or shrubs at the Site without written approval of the Client / Superintendent. Prior to works commencing onsite ADCO will identify flora and fauna that may be impacted by construction activities. Flora and fauna management controls will be communicated to project personnel through the following consultative forums:

- / Subcontractor procurement meetings
- / Project Specific Site Induction
- / Daily debrief meetings
- / Toolbox Meetings
- / Site Notice boards and alerts.

ADCO will monitor compliance to fauna management through performance evaluation activities.

11.3.14 Dewatering

Management

In the event that dewatering is required a dewatering management plan will be provided specific for the dewatering scope. ADCO will liaise closely with key stakeholders and obtain all required regulatory approvals required for the dewatering works. Dewatering works will not commence until all approvals have been obtained.

11.3.15 Seasonal Weather

Management In the event of an extreme weather event (such as a storm, heavy rainfall, high winds), ADCO will review the control measures identified within the EMP to ensure there is no environmental disturbance as a result of the weather event.

11.3.16 Cultural Heritage

Management Where heritage management is a requirement of project compliance, work activities are completed with due consideration and protection. Cultural Heritage Management requirements will be included in the site induction and discussed through project consultative forums.

Unexpected Find An 'unexpected heritage find' is "any unanticipated archaeological discovery that has not been identified during a previous assessment or is not covered by an existing permit under relevant legislation".

The range of potential archaeological discoveries can include but are not limited to:

- / Aboriginal stone artefacts, shell middens, burial sites, engraved rock art, scarred trees.
- / Remains of infrastructure including buildings, footings, old kerbing and pavement, former road surfaces, timber and stone culverts, bridge footings and retaining walls.
- / Artefact scatters including clustering of broken and complete bottles, glass, ceramics, animal bones and clay pipes.

When a "find" is identified in a work area:

1. All work in the find area must be stopped and the find must be reported to the Site Manager.
2. The Site Manager must establish a 'no-go zone' for at least 10 metres around the find. (e.g. fencing, solid barricades) where practical. No interference, including works, ground disturbance is allowed in the zone.
3. The Site Manager must notify the Project Manager.
4. The Project Manager to contact a heritage Adviser and arrange for the Adviser to assess the find.
5. Subject to assessment, work may recommence at a set distance from the item. Existing protective barriers may need to be adjusted.
6. To recommence work in the find area, the Project Manager must obtain written clearance from the Adviser including any additional project/heritage approvals/determinations.
7. Where required, the Project Manager / State HSE Manager will be required to update the Project Risk Register to reflect the find and any additional conditions / controls.
8. The Site Manager or HSE Advisor will be required to incorporate any changes to the site induction.

12 INCIDENT MANAGEMENT

The management of incidents will occur in accordance with *Procedure – Incident Management*.

Reporting

The reporting of all incidents from work activities within and outside the work boundary is mandatory on ADCO project sites. Incidents to be reported includes:

- / Injuries regardless of severity
- / Near Miss Events
- / Environmental
- / General incidents e.g. property, equipment and service damage.

Workers are advised at the site induction that all incidents irrespective of type or severity must be reported to the Site Manager or HSE Advisor immediately upon occurrence.

In accordance with contract requirements, ADCO will notify nominated representatives of incidents within agreed time frames.

Investigation

Examples of environmental incidents include, but are not limited to the following events:

- / Unauthorised disturbance of vegetation;
- / Hydrocarbon or chemical spill;
- / Uncontrolled discharges into water bodies, creeks, stormwater drains etc;
- / Breach of licence or permit conditions; and
- / Unauthorised impacts to protected areas.

Incidents must be investigated by the Site Manager and HSE Advisor. The investigation is intended to:

- / Collate information / documentation associated with the incident.
- / Identify Contributing Factors and Root Causes
- / Identify job system and behavioural factors leading to the incident.
- / Identify non-conformances leading to the incident.
- / Identify corrective and preventative action to mitigate recurrence of the incident.

The extent to which additional positions (e.g. Project Manager, HSE Manager, Construction Manager or Head of Risk and Compliance) are involved in the investigation of an incident is dependent on the severity and complexity of the incident.

Corrective actions and preventative actions are noted in Incident Investigation reports and implemented according to the ADCO risk management time frame. Incident reports are completed within 7 days of occurrence. Incident reports are closed out within 28 days of occurrence.

Monitoring

The Project Manager, Site Manager and HSE Advisor are responsible for ensuring that actions (corrective / preventative) arising out of an incident investigation are implemented and monitored for compliance.

Notification to Regulator

Where an incident is notifiable under the WHS legislation of the state in which it occurred, notification to the regulator will be made by any of the following positions: HSE Manager, Construction Manager, State Manager or Head of Risk and Compliance.

Retaining Records

All injury records and investigation findings will be retained within the online HSE management system – HammerTech.

12.1 COMPLAINT MANAGEMENT

Complaints will be managed in accordance with the Community and Stakeholder Engagement Plan.

Complaints can be raised for issues such as, noise, dust, light, pollution, perceived environmental management issued and breaches of regulatory approvals. A person may register a complaint with ADCO directly through verbal or consultative forums. Information relating to complaints is documented on the *Complaints Form*. Complaints are registered on the Register – Project Complaints. Complaints must:

- / Be immediately reviewed and Investigated by the Project Manager, Site Manager and/or HSE Advisor.
- / Be actioned within 48 hours by the Project Manager, Site Manager and/or HSE Advisor. Actions to be noted on the form. This includes a response (email or verbal) to the person generating the complaint.

In general, the below recommended actions should be followed:

- / Respond to the complainant in an objective, polite and courteous manner.
- / Engage with the complainant to correctly understand the complaint.
- / Seek clarification and confirm the issues, relevant information, and outcomes sought (i.e. summarise the main points).
- / Clarify the application of any relevant legislation, policies or procedures.
- / Resolve the complaint and acknowledge the complainant.
- / If the complaint cannot be resolved within a reasonable time frame, advise the complainant about the complaints process and indicative response.
- / Take reasonable action to prevent similar complaints in the future

13 EMERGENCY MANAGEMENT

Refer to project Health and Safety Management Plan – Emergency Management which details the emergency management control required in the event of an environmental emergency.

14 MONITORING AND CONTINUAL IMPROVEMENT

Progress against project targets is monitored by the project team (Project Manager, Site Manager, HSE Advisor) through:

- / Regular daily visual inspections of work activities.
- / Completion of the Weekly Site Inspection report.
- / Close out of identified actions for non-conformances.
- / Internal / External Audits and Inspections.

Confirmation of achievement of project targets is reviewed through:

- / Project Control Reports
- / Project audits.
- / Other internal or external audits (e.g. client, FSC).
- / HammerTech reporting.
- / A reduction in incident and non-conformances across the project, State and nationally.

In the event that project targets are not being achieved by the project team, the Construction Manager and State HSE Manager will implement change to ensure project targets are met.

14.1 AUDITS

Project audits completed by the HSE Manager or nominated person are a formal a review of project compliance against select criteria of the HSE Management System. Projects are required to be audited against both national (internal procedures) and project criteria (site specific).

The level of compliance to the requirements of the HSE System is determined by the audit score achieved. Any corrective action (e.g. non-conformances) identified in the audit, must be addressed by the site team within a maximum of seven working days of receipt of the audit report. Corrective actions and supporting evidence must be attached to the Audit Report within the online HSE Management System.

Audits are to occur in accordance with the project [Audit Schedule](#) which will detail the applicable audits to be carried out on the project.

14.1.1 Audit Schedule

Audit / Inspection Type	Frequency / Time Frame	Participants
Internal HSE Audit	Twice throughout project delivery.	HSE Manager or nominated person (lead) / Construction Manager / Project Manager / HSE Advisor/ Site Manager
Third party system compliance audit i.e. Federal Safety Commission, Bsi	As advised	Head of Risk and Compliance / HSE Manager / Construction Manager / Project Manager / HSE Advisor/ Site Manager

14.2 COMPLIANCE ACTIVITIES

14.2.1 Inspections

Performance monitoring will occur in accordance with *Procedure – Performance Management* which details ADCO's approach to monitoring work conditions and behaviour. ADCO will carry out daily and weekly workplace inspections to review and confirm compliance to approved work practices and controls.

Regular daily visual inspections of work activities and work areas will be completed by the Site Manager, HSE Advisor and Health and Safety Representative (if applicable). Formal inspections will be completed by the Project Manager, Site Manager, HSE Advisor using the *Weekly Site Inspection* form.

The inspection is required to reflect the level of compliance to:

- / High Risk Work Activities
- / Subcontractor Compliance
- / General site conditions.

Inspections completed will be prioritised based on the level of risk and all records of inspections will be retained within HammerTech. "Issues" will be recorded for compliant and non-compliant observations within HammerTech. "Issues" identify the observation description, actions required to rectify, subcontractor responsible and time frame for implementation.

14.2.2 Monitoring – Environmental Compliance Obligations

On-site inspections and monitoring will be carried out to ensure environmental controls achieve their objectives and to facilitate modification where necessary. The table below details the projects inspection and monitoring requirements to ensure environmental compliance obligations are achieved.

Aspect	Compliance Obligation	Responsibility	Frequency
Dust	Monitoring for visible dust Depositional and Directional dust gauges	HSE Advisor / Site Manager	Daily – visual
Noise	Monitoring of Sound Pressure Levels	Project Manager	Continuous Automated Monitoring
Vibration	Monitoring of vibration levels.	Project Manager	Continuous Automated Monitoring
Waste Management	Use of waste bins– inspect contents	HSE Advisor / Site Manager	Weekly
Waste Management – Recycling	Waste disposal – documentation provided by waste removalist detailing quantities and percentage waste recycled / diverted from landfill.	Project Manager	Monthly
Tree Protection Zone No-Go zones	Ensure areas are protected e.g. fenced and sign posted Ensure works are located outside fenced off areas Inspect protection for breaches. Inspect irrigation (if applicable)	HSE Advisor / Site Manager	Weekly
Hazardous Substances and Dangerous Goods	Review the storage of Hazardous Substances and Dangerous Goods. / Presence and detail of Safety Data Sheets (SDS) / Suitability and effectiveness of storage and bunding / Location of spill kits	HSE Advisor / Site Manager	Weekly
Sediment Control and Onsite Water Management	Monitoring to ensure sediment laden water is managed properly and not discharged offsite.	HSE Advisor / Site Manager	Daily – visual
Sediment Control and Onsite Water Management	Establishment of erosion and sediment control devices.	HSE Advisor / Site Manager	Weekly / Following a rainfall event

Aspect	Compliance Obligation	Responsibility	Frequency
Weeds	Monitor weed infestations to ensure noxious weed infestations found within the area are controlled.	HSE Advisor / Site Manager	Weekly
Onsite water Management	Monitoring of water prior to discharge offsite	HSE Advisor / Site Manager	As required
Testing of excavated soil	Suspected contaminated soil from where excavated or prior to reuse at a different location onsite.	Project Manager	As required

Note: As applicable Environmental monitoring may involve collecting and interpreting data to provide quantification of the effectiveness of the Environmental Management System. All equipment used for environmental monitoring will be calibrated as per manufacturer's requirements. Where laboratory testing is required, a NATA accredited laboratory will be used. Certificates, checklists and records of the calibration, NATA accredited and installation checklists are maintained to verify compliance with these requirements.

14.3 ENVIRONMENTAL PERFORMANCE MEASUREMENT

The Management System objectives are to assist ADCO in:

- / Achieving and maintaining compliance with the requirements ISO 9001, AS 4801 and ISO 14001 in each State in which ADCO operates;
- / Maintaining a practical, proactive and efficient management system to support quality, safety and environmental management strategies on each project;
- / Planning design and construction activities to minimise or eliminate quality, environmental and safety related risks;
- / Promoting a proactive attitude towards work practices required to support the strategic vision;
- / Supporting all persons involved with our business towards alignment with ADCO's strategies and to meet their accountabilities and responsibilities;
- / Ensuring that all works undertaken and products, materials and equipment provided are fit for purpose and safe for use;
- / Ensuring that non-conformances, defects and other issues and impacts are reported, corrected, analysed and corrective action implemented; and
- / Providing a framework for continual improvement in its business activities.

These objectives are targeted and measured through the following performance indicators:

- / Proactive reporting, investigation and closure of incidents and non-conformances;
- / Quality processes implemented and managed on all projects, supported by staff training;
- / Nil regulatory notices (i.e. improvements, infringements, prohibitions);
- / Auditing achieving a Gold/Silver rating compliance on > 85% of projects;
- / Nil incidents that adversely impact on the environment;
- / Other targets set in annual and 3 year business plans and strategies for Horizon 1, 2 and 3.

14.4 PROJECT ENVIRONMENTAL OBJECTIVES AND TARGETS

The below Environmental Objectives and Targets will be set and implemented for the project and reviewed periodically in line with the management plan review. Objectives will be achieved through:

- / Compliance with the requirements of this Health and Safety Management Plan
- / Implementation of controls identified within the Project Risk Register
- / All controls are implemented before commencing work to ensure all known risks are eliminated or controlled

14.4.1 Lead Indicators

Lead Indicator	Measurement	Validation	Target
Leadership Commitment	Environmental Management Plan – Environmental responsibilities described within Organisational Roles and Responsibilities	Approved Environmental Management Plan. Management Plan signed by ADCO project team.	Environmental Management Plan approved by all necessary parties within agreed timeframe Environmental Management Plan periodically reviewed, amended and re-issued as per agreed review frequency. 100% of Project team signed onto Management Plan.
Compliance with all standards, plans and audit schedules	Development of Audit Schedule Audits conducted as per schedule	Audit schedule Audit Reports Audit actions Non-conformance register	100% audits executed as per Audit Schedule 100% of audit Reports completed within agreed timeframes 100% of actions associated with non-conformances closed out within agreed time
Communication and Consultation	Daily Pre-Work briefings Toolbox Meetings HSE Committee Meetings	Attendance registers Meeting minutes Training support material	Daily Pre start meeting Toolbox Meetings at nominated frequency

14.4.2 Lag Indicators

Lag Indicator	Measurement	Validation	Target
Dust complaints lodged by stakeholders	Response time and time frame for implementation of correction actions.	Complaints received and actioned within Complaint form.	Immediately reviewed and Investigated Be actioned within 48 hours
Noise complaints lodged by stakeholders	Response time and time frame for implementation of correction actions.	Complaints received and actioned within Complaint form.	Immediately reviewed and Investigated Be actioned within 48 hours
Vibration complaints lodged by stakeholders	Response time and time frame for implementation of correction actions.	Complaints received and actioned within Complaint form.	Immediately reviewed and Investigated Be actioned within 48 hours
Lighting complaints lodged by stakeholders	Number of lighting complaints received	Complaints received and captured within Complaint form.	Immediately reviewed and Investigated Be actioned within 48 hours
Contamination of marine, groundwater and surface water systems	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Spills greater than 100 Litres	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Spills which require an emergency response	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Injury or death of any fauna caused by vehicles or excavations	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Disturbance of vegetation outside the construction area due to construction activities	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Off-site traffic leaving formed roads or approved tracks	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero

Lag Indicator	Measurement	Validation	Target
Invasive species introduced into construction area	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Reportable Environmental Incidents	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Major Environmental Incidents	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Environmental Near Misses	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Cultural heritage Incident	Number of Environmental Incidents	Incident data reported in Environmental reports.	Zero
Minor Environmental Incidents (<25)	Number of Environmental Incidents	Incident data reported in Environmental reports.	<2
Minor spills controlled, contained and cleaned up within 24 hours	Number of Environmental Incidents	Incident data reported in Environmental reports.	100%
Hazardous materials managed and disposed of appropriately	Weekly Site Inspection Issue identification	Minimum one per week.	100%

14.5 CORRECTION AND CORRECTIVE ACTION

Activities on the project that may result in actions includes but is not limited to:

- / Audits (Internal, External).
- / Daily Inspections.
- / Weekly Site Inspections.
- / High Risk Work Activity Inspections.
- / Subcontractor compliance monitoring inspections / task observations.
- / General site observations.
- / Hazard identifications / Issue Notification Form
- / Incident investigations.
- / Risk Assessments.
- / Alerts / Notices

Actions identified from observations are to be entered into HammerTech and tracked until they are closed out within the timeframe noted. Upon identification or notification, the HSE Advisor or Site Manager must review and assess the risk and develop appropriate controls according to the principles of the hierarchy of controls.

Actions that arise from an incident or dangerous occurrence must be reviewed by the Project Manager, Construction Manager and State HSE Manager and reviewed for effectiveness through site monitoring activities. Actions, including amendments and updates, to the Management System and Management System

Documentation must be authorised by the Head of Risk and Compliance, the HSE Leadership Group or the Quality Leadership Group.

Actions that arise from an external audit by will be entered into HammerTech for tracking and close out.

The assessment of results obtained through monitoring activities, non-conformances, correcting poor performance, investigating the reasons for poor performance and addressing the potential likelihood of future poor performance will be conducted in accordance with *Procedure – Performance Management*.

Where a worker does not comply with a risk or behaviour control requirement, disciplinary action through the ADCO non-conformance system will be initiated. Dependent on the severity of the non-compliance, workers are subject to a tiered warning system and may receive up to 3 warnings for engaging in the same non-compliant activity. Written warnings in the form of an Improvement Notice are issued to a company, when an individual of that company has engaged in a non-compliant activity. ADCO reserves the right to deny a person access to site - irrespective of the number of warnings required / issued - if the non-compliance could / has resulted in a dangerous occurrence. This determination will be made in consultation with Construction Manager, Project Manager, Site Manager and HSE Manager.

14.6 MEASURING, RECORDING, MONITORING AND REPORTING

ADCO utilises a range of tools, systems and forums to measure, monitor, implement, report, and respond on its performance, objectives, targets and impacts. These include, without limitation:

Tools / Systems

- / HammerTech, Aconex, Dropbox, Power BI and CRM

Meetings, Forums and Reports

- / Strategic Plans (Horizon 1, 2 and 3 Reports)
- / Board Meetings
- / State Management Meetings
- / Leadership Forum
- / HSE Leadership Group
- / Quality Leadership Group
- / Construction and Commercial Manager Forums
- / Operational Assurance Reports
- / Project Control Reports (project specific)
- / PCG Reports (project specific)

APPENDIX 1 – PROJECT RISK REGISTER

PEOPLE WHO BUILD



PROJECT RISK REGISTER

PROJECT NAME:

TAFE IATC KINGSWOOD

CLIENT:

TAFE NSW

PRINCIPLE CONTRACTOR :

ADCO CONSTRUCTIONS PTY LTD

PROJECT NO.

3547

REVISION

006

VERSION CONTROL - 09/03/2022 Do Not Amend Date

Assessment Reason:	Construction Risk Register (High Risk Works)			Version	Rev 1																					
Initial Date Completed:	15/11/2021																									
Participants/Involvement:	<table border="1"> <thead> <tr> <th>Name</th> <th>Position</th> <th>Company</th> </tr> </thead> <tbody> <tr> <td>Pierce Brennan</td> <td>Project Manager</td> <td>ADCO</td> </tr> <tr> <td>Paul Gower</td> <td>Site Manager</td> <td>ADCO</td> </tr> <tr> <td>Phil Provenzano</td> <td>HSE Manager</td> <td>ADCO</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Name	Position	Company	Pierce Brennan	Project Manager	ADCO	Paul Gower	Site Manager	ADCO	Phil Provenzano	HSE Manager	ADCO											
Name	Position	Company																								
Pierce Brennan	Project Manager	ADCO																								
Paul Gower	Site Manager	ADCO																								
Phil Provenzano	HSE Manager	ADCO																								
Comments:	Initial Review																									

Assessment Reason:	Initial Review of High Risk Construction Works			Version	Rev 2																					
Review Date:	26/11/2021																									
Participants/Involvement:	<table border="1"> <thead> <tr> <th>Name</th> <th>Position</th> <th>Company</th> </tr> </thead> <tbody> <tr> <td>Michael Brombal</td> <td>HSE Advisor</td> <td>ADCO</td> </tr> <tr> <td>Paul Gower</td> <td>Site Manager</td> <td>ADCO</td> </tr> <tr> <td>Pierce Brennan</td> <td>Project Manager</td> <td>ADCO</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Name	Position	Company	Michael Brombal	HSE Advisor	ADCO	Paul Gower	Site Manager	ADCO	Pierce Brennan	Project Manager	ADCO											
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Paul Gower	Site Manager	ADCO																								
Pierce Brennan	Project Manager	ADCO																								
Comments:																										

Assessment Reason:	Review of risk and controls to align and comply with RFS Fireban Exemption			Version	Rev 3																					
Initial Date Completed:	15/12/2021																									
Participants/Involvement:	<table border="1"> <thead> <tr> <th>Name</th> <th>Position</th> <th>Company</th> </tr> </thead> <tbody> <tr> <td>Russell Eccles</td> <td>Senior EHS Advisor</td> <td>ADCO</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Name	Position	Company	Russell Eccles	Senior EHS Advisor	ADCO																	
Name	Position	Company																								
Russell Eccles	Senior EHS Advisor	ADCO																								
Comments:	Update to Hot Works Controls for Total Fire Bans																									

Assessment Reason:	Programmed review of risk and controls for current and impending works.			Version	Rev 4																					
Review Date:	26/02/2022																									
Participants/Involvement:	<table border="1"> <thead> <tr> <th>Name</th> <th>Position</th> <th>Company</th> </tr> </thead> <tbody> <tr> <td>Simon Brown</td> <td>Site Manager</td> <td>ADCO</td> </tr> <tr> <td>Russ Eccles</td> <td>EHS Advisor</td> <td>ADCO</td> </tr> <tr> <td>Pierce Brennan</td> <td>Project Manager</td> <td>ADCO</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Name	Position	Company	Simon Brown	Site Manager	ADCO	Russ Eccles	EHS Advisor	ADCO	Pierce Brennan	Project Manager	ADCO											
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Russ Eccles	EHS Advisor	ADCO																								
Pierce Brennan	Project Manager	ADCO																								
Comments:	Transcribed into new ADCO template																									

Assessment Reason:
Initial Date Completed:
Participants/Involvement:

Updated following Formwork/HV and Shotcrete HR Workshops
13/05/2022

Name	Position	Company
Simon Brown	Site Manager	ADCO
Russ Eccles	EHS Advisor	ADCO
Pierce Brennan	Project Manager	ADCO

Version Rev 5

Comments:

Assessment Reason:
Review Date:
Participants/Involvement:

Update with Fatigue Management and Scaffold HR Workshop outcomes
22/07/2022

Name	Position	Company
Simon Brown	Site Manager	ADCO
Russ Eccles	EHS Advisor	ADCO
Pierce Brennan	Project Manager	ADCO

Version Rev 6

Comments:

Assessment Reason:
Review Date:
Participants/Involvement:

Name	Position	Company

Version Rev 7

Comments:

Assessment Reason:
Review Date:
Participants/Involvement:

Name	Position	Company

Version Rev 8

Comments:

INTRODUCTION

LEGISLATION, CODES OF PRACTICE AND AUSTRALIAN STANDARDS

To assist in the identification of all health, safety and environment Legislation, Codes of Practice, Standards and other compliance requirements that apply to ADCO operations and that of the project, refer to **Workplace Safety Australia**. The link is available to ADCO personnel via the ADCO HUB under the "Compliance" tab.

Safety and Environmental Legislation:	
Work Health and Safety Act 2011	Workers Compensation Act 1987
Work Health and Safety Regulation 2017	Fair Work Act 2009
Environment Protection and Biodiversity Conversation Act 1999	Code for the Tendering and Performance of Building Work 2016
Workplace Injury Management and Workers Compensation Act 1998	Protection of the Environment Operations Act 1997
Applicable Standards:	
AS/NZS 3610 SUPP 1-1995 - Formwork for concrete	AS/NZS 1576: 2010 Scaffolding (Series); AS/NZS 4576:2020 Guidelines for Scaffolding
AS/NZS 4671:2001 - Steel reinforcing materials	AS/NZS 1418.1-2002 - Cranes, hoists and winches, Part 1: General requirements
AS/NZS 3000:2018 Electrical Installations Wiring Rules	AS/NZS 4600 Cold formed steel structures
AS/NZS 3012:2019 Electrical Installations - Construction and Demolition Sites	AS/NZS 5131: 2016 Structural Steelwork - fabrication and erection
AS 1562.1:2018 Design and Installation of Sheet Roof and Wall Cladding - Metal	AS/NZS 4389:2015 Roof Safety Mesh
AS2601:2001 Demolition of Structures	AS3850.1: 2015 Prefabricated concrete elements General requirements
AS/NZS 1892 (Series) Safe Use of Portable Ladders	AS 1657:2018 Fixed Platforms Walkways, Stairways & Ladders
NSW State Codes of Practice:	
This is a comprehensive list of current NSW COP's. Note: Superseded COP's are still enforceable and should be referenced on the NSW SafeWork website.	
SAFE DESIGN OF STRUCTURES	FIRST AID IN THE WORKPLACE
CONSTRUCTION WORK	HAZARDOUS MANUAL TASKS
DEMOLITION WORK	HOW TO MANAGE AND CONTROL ASBESTOS IN THE WORKPLACE
EXCAVATION WORK	HOW TO SAFELY REMOVE ASBESTOS
FORMWORK	LABELLING OF WORKPLACE HAZARDOUS CHEMICALS
MANAGING THE RISK OF FALLS AT WORKPLACES	PREPARATION OF SAFETY DATA SHEETS FOR HAZARDOUS CHEMICALS
MANAGING ELECTRICAL RISKS IN THE WORKPLACE	MANAGING RISKS OF HAZARDOUS CHEMICALS IN THE WORKPLACE
MANAGING THE RISKS OF PLANT IN THE WORKPLACE	CONFINED SPACES
HOW TO MANAGE WORK HEALTH AND SAFETY RISKS	WELDING PROCESSES
WORK HEALTH AND SAFETY CONSULTATION, COOPERATION AND COORDINATION	ABRASIVE BLASTING
MANAGING THE WORK ENVIRONMENT AND FACILITIES	MANAGING NOISE AND PREVENTING HEARING LOSS AT WORK
MANAGING PSYCHOSOCIAL HAZARDS AT WORK	SAFework NSW CRYSTALLINE SILICA - GENERAL FACT SHEET
National Standards and Codes of Practice	
NATIONAL STANDARD FOR LICENSING PERSONS PERFORMING HIGH RISK WORK	
NATIONAL CODE OF PRACTICE FOR INDUCTION FOR CONSTRUCTION WORK	
Internal Health & Safety System References:	
Asbestos Management (Risk Management Procedure)	Working Around Live Services (Risk Management Procedure)
Confined Spaces (Risk Management Procedure)	Risk Management (Operational Procedure)
Excavation (Risk Management Procedure)	Site Management (Operational Procedure)
Operating Plant (Risk Management Procedure)	Consultation and Communication (Operational Procedure)
Pre Cast and Tilt Up Panels (Risk Management Procedure)	Emergency Management (Operational Procedure)
Static Plant (Risk Management Procedure)	Health Management (Operational Procedure)
Demolition (Risk Management Procedure)	Incident Management (Operational Procedure)
Suspended Formwork (Risk Management Procedure)	Performance Management (Operational Procedure)
Traffic Management & Movement (Risk Management Procedure)	Permit Management (Operational Procedure)
Work at Height (Risk Management Procedure)	Subcontractor Management (Operational Procedure)
Substances Management (Risk Management Procedure)	Safety Essentials / Risk Management Protocols
ADCO HUB	Safer by Choice
Internal Environmental System References:	
Environmental Management	Waste Management
Erosion and Sediment Management	Spills Management
Air Quality Management	Fauna and Flora Management
Water Quality Management	Potable Water Management
Noise and Vibration Management	Non-potable Water Management
Contaminants	Heritage Management

RISK MANAGEMENT PROCESS

Risk management is the process of identifying, assessing and controlling threats. These threats could stem from a wide variety of sources, including high risk construction work activities. Once control measures have been identified and put into place, reviewing these controls is important to ensure the suitability and effectiveness of the controls.

HIERARCHY OF CONTROL

The ways of controlling risks are ranked from the highest level of protection to the lowest. This ranking is known as the Hierarchy Of Control. The Hierarchy Of Control can be applied in relation to any perceived risk.

RISK ASSESSMENT

Prior to commencing project works, this Project Risk Register must be populated in consultation with project team representatives e.g. Project Manager, HSE Manager, Site Manager, HSE Advisors etc. The purpose of the register is to identify:

- Activities and tasks of a high risk nature (e.g. demolition works)
- Anticipated Hazards (e.g. live electrical power)
- Risk Outcomes (e.g. worker electrocuted)
- Risk Ratings (initial and residual)
- Control Measures (to eliminate or mitigate the risk outcomes)
- References (internal or external)
- Responsibilities
- Permit Requirements
- Activity Status

The **Risk Matrix** (next tab) is based on Consequence and Probability ranging from Extreme, High, Medium and Low. If a residual risk of "**Extreme**" or "**High**" remains on the completion of the risk assessment against any perceived risk, a **HOLD Point** must be placed on the activity and the issue escalated as follows:

- **High** – Construction Manager and / or HSE Manager
- **Extreme** – State Manager

The **HOLD Point** cannot be released until a solution has been provided by the designated persons as above (SM, CM, HSEM).

Note: In accordance with the standard, impacts resulting in a residual risk rating of (E) Extreme or (H) High will be defined as "**Significant Risk**". Communicating impacts falling into these categories will be undertaken through the following but not limited to; induction process, contractor meeting and client meetings only if the activity progresses under these ratings.

Monitoring of the activity will include but not be limited to: Routine Daily Supervision, through Weekly Site Inspections including random checks against issued Authority To Work Permits.

RISK ASSESSMENT PERIODIC REVIEW

For the life of the project, the Risk Register and other relevant plans must be reviewed on a regular basis as per the review schedule below, and kept up to date with changes to scope, program activities and identified high risk works.

REVIEW SCHEDULE

Project Plans	6 monthly (or sooner if required)
Project Risk Register	Monthly (or sooner if required)

CONSULTATION AND COMMUNICATION

Information pertaining to this Project Risk Register will be discussed with relevant parties (e.g. ADCO personnel and affected contractors) prior to the commencement of the project and upon any review. Contractors will have access to this Project Risk Register via ACONEX and through ADCO Site Management. Note: The risk assessment does not intend to supersede or override any legal or legislative obligations including processes or Safe Work Method Statements prepared by contractors. Its purpose is to identify high risk activities and potential threats attributed to the project scope of works. Controls measures identified should form part of contractors SWMS's as ADCO conceive these as minimal requirements.

Required information will be communicated through:

- Site Inductions
- Authority to Work Permits
- Safe Work Method Statements (SWMS)
- Consultative forums – Daily prestart meetings, Toolbox meetings, Client meetings, Subcontractor meetings
- Electronically through Aconex or HammerTech

RISK MATRIX

PROCESS		CONSEQUENCE (C)		PROBABILITY (P)																														
Number the risks / hazards if required.		The outcome or impact of an event		The chance of the occurrence.																														
<div>1. Identify the activity.</div> <div>2. Identify possible outcomes of the risk / hazard if no controls are implemented.</div> <div>3. Identify the initial risk rating. (IR). (No controls in place)</div> <div>4. Identify action to be taken to control / avoid the risk. Review the risk triangle to identify a required control action.</div> <div>5. Identify the residual risk rating. (RR). (Controls in place)</div> <div>6. As required, identify any document reference (e.g. Procedure, National Code of Practice).</div> <div>Where required: Ensure that all persons / companies who participated in this review are provided with a copy of the completed form.</div>		<table><tr><th></th><th>SAFETY</th><th>ENVIRONMENT</th></tr><tr><td>1</td><td>Permanent disability or death.</td><td>Toxic release off site with detrimental environmental impact.</td></tr><tr><td>2</td><td>Serious bodily injury.</td><td>Offsite release contained with outside treatment/assistance. Minimal detrimental environmental impact.</td></tr><tr><td>3</td><td>Hospitalisation resulting in LTI.</td><td>On site release contained with outside treatment/assistance. No detrimental environmental impact.</td></tr><tr><td>4</td><td>External medical treatment. No LTI.</td><td>On site release contained. No environmental impact.</td></tr></table>			SAFETY	ENVIRONMENT	1	Permanent disability or death.	Toxic release off site with detrimental environmental impact.	2	Serious bodily injury.	Offsite release contained with outside treatment/assistance. Minimal detrimental environmental impact.	3	Hospitalisation resulting in LTI.	On site release contained with outside treatment/assistance. No detrimental environmental impact.	4	External medical treatment. No LTI.	On site release contained. No environmental impact.	<table><tr><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><th>ALMOST CERTAIN</th><th>LIKELY</th><th>POSSIBLE</th><th>UNLIKELY</th></tr><tr><td>Expected to occur in most circumstances</td><td>Probably occur at some time.</td><td>May occur at some time.</td><td>Not likely to occur in normal circumstances.</td></tr></table>				A	B	C	D	ALMOST CERTAIN	LIKELY	POSSIBLE	UNLIKELY	Expected to occur in most circumstances	Probably occur at some time.	May occur at some time.	Not likely to occur in normal circumstances.
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ALMOST CERTAIN	LIKELY	POSSIBLE	UNLIKELY																															
Expected to occur in most circumstances	Probably occur at some time.	May occur at some time.	Not likely to occur in normal circumstances.																															
<div></div>		<div><div><div>a. Identify the "probability" options. (P)</div><div>b. Identify the "consequence" options (C)</div><div>c. Find the connection point between P and C and enter into the risk rating column (IR and RR). e.g. B x 2 = H</div><div>d. Identify the action time frame e.g. H requires action in the same shift</div></div></div>		<div><div>ACTION TIME FRAME</div><table><tr><th>EXTREME (E)</th><th>HIGH (H)</th><th>MEDIUM (M)</th><th>LOW (L)</th></tr><tr><td>HOLD POINT</td><td>HOLD POINT</td><td>WITNESS POINT</td><td>OBSERVATION</td></tr><tr><td>IMMEDIATE action required</td><td>Action must occur IN THE SAME SHIFT.</td><td>Action must occur in < 48 HOURS.</td><td>Action AS AGREED.</td></tr></table></div>				EXTREME (E)	HIGH (H)	MEDIUM (M)	LOW (L)	HOLD POINT	HOLD POINT	WITNESS POINT	OBSERVATION	IMMEDIATE action required	Action must occur IN THE SAME SHIFT.	Action must occur in < 48 HOURS.	Action AS AGREED.															
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SAFETY ASSESSMENT										
ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Excavation	Services (electricity and gas)	Electrocution or gas explosion	H(C1)	As Built Drawings, Dial Before U Dig etc must be available on site. All known services must be isolated (if possible) prior to works. Services not able to be isolated must be identified and protected from damage. Pot hole investigations must be conducted where no information is available. Works near gas or electrical power must consider non destructive methods of soil removal including spotters etc. Risk assessment must be completed by the contractor. Authoility to work permit to be completed. Rescue Plan with trained personnel and equipment to be in place for working around services. Service Plan current and avaiable to contractors	L(D4)					ACTIVE
Excavation	Unexpected finds e.g. Asbestos, Alcoholological finds etc	Exposure to hazardous materials	H(C1)	Refer to Unexpected Finds Protocol (above)	L(D4)					ACTIVE
Excavation	Manual handling	Musculoskeletal disorders	H(C1)	Use mechanical aids where possible. Assess loads, location, hazards etc. Minimise the need to pull, push and twist loads. Manual handling training.	L(D4)					ACTIVE
Excavation	Loading trucks	Overloading	H(C1)	Ensure trucks are loaded to their legal weight permissible. All loads must be secured and covered prior to exiting the site. All material taken out of the project must be approved and going to an approved site or tipping facility. Ensure clear communcation are set between excavator and truck driver via CB Radio	L(D4)					ACTIVE
Fatigue Management	Lack of alertness Inability to concentrate Making more mistakes than usual Drowsiness, falling asleep or micro-sleeps Difficulty keeping your eyes open Not feeling refreshed after a sleep Excessive head nodding or yawning Blurred vision Mood changes Changes to personal health or fitness	Resulting in incidents, injuries/illness and poor decision making	E(B1)	Vehicle Operators – Subcontractors must comply with the Heavy Vehicle National Law & Regulations (HVNL) and Chain of Responsibility (CoR) contained within their supply agreements. For deliveries where the driver has travelled more than 100kms from home, logbooks are checked for mandated heavy vehicle rest breaks. Observations are undertaken for randomly selected heavy vehicles to review compliance with HVNL, e.g., load restraint, vehicle registration, driver's licence and gross vehicle mass. Construction Workers - Minimum 10 hours between shifts plus travel/journey time and no more than 12 hours worked. Restricts the maximum number of workdays to 12 in 14 consecutive days. Minimises to five consecutive occasions where eight (8) hours are worked at night (i.e., after normal office hours) or four (4) consecutive occasions where 10 hours are worked at night or three (3) consecutive occasions where 12 hours are worked at night without a 48-hour rest break. Ensures employees receive a minimum of 48 consecutive hours free of work in a 14 day period; and maintain a capacity to replace or relieve workers where unplanned or unavoidable extended hours or emergency (after hours) works, e.g., tower crane assembly, increase the potential for fatigue. Dedicated Fitness For Work Fatigue Management Sub Plan - is an ADCO management system requirement where a project is remote, e.g., FIFO OR scheduling where a project has two daily shifts, e.g., night shift and day shift OR project scheduling exceeding 10 days on / 2 days off for two or more consecutive weeks. Filtered backflow installed on water mains to ensure water purity Designated respite areas and Water bublers installed around site and highlighted on site notice board and inductions. Tool Box Meeting will be undertaken to raise awareness of Fatigue Management including information posters.	L(D4)	Procedure - Health Management Fitness For Work Fatigue Management Sub Plan (as required) RELEVANT SUBCONTRACTORS	ADCO GROUP PTY LTD	No	No	ACTIVE
Installation of Perimeter Safety Screens	Lifting and installing screens	Materials falling	H(C1)	Exclusion zones must be established, managed and sign posted to warn workers and others of danger above. Ensure controls are in place to prevent persons or materials falling from height. Use spotters to assist in keeping workers and others out of harms way. Public areas to be secured and traffic management to be used. Confirm all engineering for screens and attachments etc.	L(D4)					ACTIVE
Notification of Impacting Activities - disruption notices to hospital as per hospital protocols	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	Note: impacting causing activities such as services disconnections, reconnections, fire alarm disconnections, works in live areas, traffic e.g. in shopping centres or hospitals may require completion of Activity Checklist and Permit to Work. Other activities as defined by clients may also require notification. All impacting activities must be discussed with ADCO Management prior to commencing. An NIA / ATW Permit must be cancelled or suspended if: An incident has occurred in relation to the NIA or high-risk work activity or other reasoning determined by ADCO site management. Task observation identifies significant non-compliances against the NIA or Permit conditions. (e.g. failure to comply with control measures). Changes to the work activity or risk controls are required. If concerns are raised by the relevant personnel / stakeholders associated with the work activity.	L(D4)	Procedure - Permit Management Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	MANDATORY REQUIREMENT	ACTIVE
Operating Mobile Plant on Engineered Surfaces	Poor planning	Resulting in incidents, injuries and poor decision making	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure notifications have been completed and submitted to relevant authorities. Ensure engineering approval has been granted. Ensure any back propping required has been installed in accordance with engineers requirements. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc	L(D4)	Procedure - Operating Plant Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	MANDATORY REQUIREMENT FOR ENGINEERED SURFACES WITH SUPPORTS or BACK PROPPING	ACTIVE
Operating Mobile Plant on Engineered Surfaces	Workers unfamiliar with correct process including scope of works.	Resulting in incidents, injuries and poor decision making	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Compliance to relevant Codes of Practice e.g. Managing the risk of plant in the workplace. Load restrictions identified on suspended slabs through signage, traffic movement plan etc. Methodology and controls to be monitored in accordance with SWMS. Permit to be sought by operating contractor. ADCO to review and approved detailing specific controls Prestart to be conducted within Approved Permit.(To ensure all workers are familiar with risks & controls)	L(D4)					ACTIVE
Operating Mobile Plant on Engineered Surfaces	Unqualified / incompetent personnel	Resulting in incidents, injuries and poor decision making	H(C1)	As prescribed above.	L(D4)					ACTIVE
Operating Mobile Plant on Engineered Surfaces	Ground conditions / engineered surfaces	Plant rollover / structural collapse	H(C1)	Any mobile plant to operate over an engineered surface must have approval from ADCO. Strict compliance to engineered principles is mandatory e.g. separation of plant, voids etc Any back propping is not to be removed without engineer approval. Ground testing is required for plant to operate on spoil surfaces or where known ground surfaces is engineered.	L(D4)					ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Poor planning	Resulting in incidents, injuries and poor decision making	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure notifications have been completed and submitted to relevant authorities. Delivery and retrieval of plant has been planned including traffic management requirements. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc 24hrs Notice to ADCO Site Management prior to delivery/pick up. Works to be reviewed and approved via ADCO Permit to Work System (Mobile Plant on Engineered Surfaces)	L(D4)	Procedure - Operating Plant Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	Optional	ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Workers unfamiliar with correct process including scope of works.	Resulting in incidents, injuries and poor decision making	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Compliance to relevant Codes of Practice e.g. Managing the risk of plant in the workplace. Methodology and controls to be monitored in accordance with SWMS. Works to be reviewed and approved via ADCO Permit to Work System (Mobile Plant on Engineered Surfaces)	L(D4)					ACTIVE

SAFETY ASSESSMENT

ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Unqualified / incompetent personnel	Resulting in incidents, injuries and poor decision making	H(C1)	Operators must be provided appropriate training or instruction which can include: • tasks, activities • control measures to minimise exposure to risks • safe working procedures, including use of mechanical aids and devices etc Competency based training is required for ALL CIVIL PLANT, and is to be refreshed every 2 to 3 years. In addition, ADCO recommend that those spotting mobile plant undergo Spotter Training.	L(D4)					ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Delivery and retrieval of plant by transport company	Resulting in incidents, injuries and poor decision making	H(C1)	Transport operators must have competency in the operation of the specific plant. Competencies for Mobile Plant operators – check and verify prior to loading or unloading as required for site operations, alternatively: evidence the transport operator has completed the nationally recognized course RIIHAN308F Load and unload plant for transport operators. 24hrs Notice to ADCO Site Management prior to delivery/pick up.	L(D4)					ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Ground conditions / engineered surfaces	Plant rollover / structural collapse	H(C1)	Ensure ground conditions are suitable for type of plant used. As required, obtain advice from a Geotechnical engineer or structural engineer on condition and suitable controls. If in doubt do not operate. Works to be reviewed and approved via ADCO Permit to Work System (Mobile Plant on Engineered Surfaces)	L(D4)					ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Poor maintenances	Mechanical failure	H(C1)	Servicing must be completed by competent persons e.g. supplier, mechanic etc. Operators must undertake daily pre start inspections as per manufactures recommendations. All defects or issues must be reported immediately and recorded into the logbook. WLL must be complied with at all times. ADCO to conduct periodic reviews of Expiring Maintenances. Contactors to provided Maintenance, Registrations Log books prior to ADCO accepting onto site.	L(D4)					ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Personnel on site	Struck by mobile plant	H(C1)	Workers must keep clear of plant in operation and where possible be in the line of sight with the operator. Where practicable, exclusion zones must be established to warn workers of plant danger. Where exclusion zones are not in place, spotters must be used. Never work with back to plant. Always advice operator of your presence. Caution of swing radius from Excavators, Cranes, Telehandlers etc. Do not attempt to approach operator via BLIND SIDE of the plant. Always wait till operator gives a signal to approach plant. Never work with back to plant. Always advice operator of your presence. Wear high viz clothing. Internal Traffic Control Plan Designated Walkways to site with Green Bunting and directional signage Methodology and controls to be monitored in accordance with SWIMS. Workers Inducted to Site, Daily Prestarts and SWMS	L(D4)	Procedure - Operating Plant Procedure - Risk Management Procedure - Subcontractor Management				ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Other mobile plant and structures	Struck by mobile plant	H(C1)	Caution of swing radius from other mobile plant and building structures, power lines etc. Always inform other operator of your presence. If safe distance cannot be maintained between plant (swing radius), spotter may need to manage all plant in affected area via radio communication with operators.	L(D4)					ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Suspended loads	Loads falling over workers	H(C1)	Safety pins and quick hitches must be secured on excavators. Lifting points on excavators must be certified and approved for lifting. Excavators used for lifting other than spoil must be fit for purpose. Refer to Australian Standards. All lifting equipment e.g. chains, slings etc. must be maintained and serviced in accordance with manufactures recommendations. A lifting equipment register must be maintained for all equipment used. Only certified persons to secure loads and direct.	L(D4)					ACTIVE
Operation of Civil Plant: Excavators Rollers Graders Drill Rigs etc	Fumes	Poisoning	H(C1)	Ensure plant is fit for purpose and the ventilation is assessed on selection of plant. Internal use of fuel driven plant is prohibited without ADCO review of assessment and controls.	L(D4)					ACTIVE
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Poor planning	Resulting in incidents, injuries and poor decision making	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure notifications have been completed and submitted to relevant authorities. Delivery and retrieval of plant has been planned including traffic management requirements. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc Excavtion Permits to be sought >1.5meters. DBYD, ADCO Services Plan to be reveiwed prior to work authorisation	L(D4)	Procedure - Operating Plant Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	Optional	ACTIVE
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Workers unfamiliar with correct process including scope of works.	Resulting in incidents, injuries and poor decision making	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Compliance to relevant Codes of Practice e.g. Managing the risk of plant in the workplace. Methodology and controls to be monitored in accordance with SWMS.	L(D4)					ACTIVE
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Unqualified / incompetent personnel	Resulting in incidents, injuries and poor decision making	H(C1)	Operators must be provided appropriate training or instruction which can include: • tasks, activities • control measures to minimise exposure to risks • safe working procedures, including use of mechanical aids and devices etc A combination of High Risk Work Licences and competency based training is required for all such plant, and is to be refreshed every 2 to 3 years. In addition, ADCO highly recommend that those spotting mobile plant undergo Spotter Training. Competency based training is required for ALL CIVIL PLANT, and is to be refreshed every 2 to 3 years. In addition, ADCO recommend that those spotting mobile plant undergo Spotter Training. VOC required every 2 years for HW Licences as follows: Mobile Crane Tower Crane Dogman Telehandler LoadShifting Equipment	L(D4)					ACTIVE

SAFETY ASSESSMENT

ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Delivery and retrieval of plant by transport company	Resulting in incidents, injuries and poor decision making	H(C1)	Transport operators must have competency in the operation of the specific plant. Competencies for Mobile Plant operators – check and verify prior to loading or unloading as required for site operations, alternatively: evidence the transport operator has completed the nationally recognized course RIIHAN308F Load and unload plant for transport operators. Deliveries to be booked in with ADCO at least 24hrs in advance. Deivery area to be marked and communicatd on Noticeboard Internal Movement plan during prestarts	L(D4)					ACTIVE
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Ground conditions / engineered surfaces	Plant rollover / structural collapse	H(C1)	Ensure ground conditions are suitable for type of plant used. As required, obtain advice from a Geotechnical engineer or structural engineer on condition and suitable controls. Assessment of placement of outriggers is paramount and must be approved by ADCO. Outriggers must be fully extended in all operations. Part extension is NOT permissible. Any mobile plant to operate over an engineered surface must have approval from ADCO. Strict compliance to engineered principles is mandatory e.g. separation of plant, voids etc Any back propping is not to be removed without engineer approval. Ground testing is required for plant to operate on spoil surfaces or where known ground surfaces is engineered.	L(D4)					ACTIVE
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Poor maintenances	Mechanical failure	H(C1)	Servicing must be completed by competent persons e.g. supplier, mechanic etc. Operators must undertake daily pre start inspections as per manufactures recommendations. All defects or issues must be reported immediately and recorded into the logbook. WLL must be complied with at all times.	L(D4)					ACTIVE
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Personnel on site	Struck by mobile plant	H(C1)	Workers must keep clear of plant in operation and where possible be in the line of sight with the operator. Where practicable; exclusion zones must be established to warn workers of plant danger. Where exclusion zones are not in place, spotters must be used. Never work with back to plant. Always advice operator of your presence. Caution of swing radius from Excavators, Cranes, Telehandlers etc. Do not attempt to approach operator via BLIND SIDE of the plant. Always wait till operator gives a single to approach plant. Never work with back to plant. Always advice operator of your presence. Wear high viz clothing. Methodology and controls to be monitored in accordance with SWIMS. Workers Inducted to Site, Daily Prestarts and SWMS Exclusion zones during lifts/redirect foor traffic	L(D4)					ACTIVE
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Suspended loads	Loads falling over workers	H(C1)	All lifting activities must be pre arranged/booked (where possible) the day prior with the ADCO. All lifting equipment e.g. chains, slings etc, must be maintained and serviced in accordance with manufactures recommendations. A lifting equipment register must be maintained for all equipment used. Only certified persons permitted to secure loads and direct. High & Low loads not permitted Single Use slings to be destroyed and disposed immediately after firt use. Bulker bags to be new and moved within load rated bins after unloading. Exclusion zones in place.	L(D4)					ACTIVE
Operation of Mobile Plant with Outriggers: Mobile Cranes Concrete Boom Pumps Telehandlers > 3 Ton EWP's - Self leveling Including Forklifts	Fumes	Poisoning	H(C1)	Ensure plant is fit for purpose and the ventilation is assessed on selection of plant. Internal use of fuel driven plant is prohibited without ADCO review of assessment and controls.	L(D4)					ACTIVE
Roofing	Poor planning and selection of crane	Incorrect or poor work practices resulting potential incidents.	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure notifications have been completed and submitted to relevant authorities. Ensure roof design has been prepared including anchor points for safety lines. Access and egress points approved by ADCO. Roof edge protection reviewed and approved by ADCO. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc Tool and Equipment Layards to be used. Scaffolding not to be set up in proximity to designated walkways. Materials to be stored away from Live edges	L(D4)	Procedure - Work at Height Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	MANDATORY REQUIREMENT	ACTIVE
Roofing	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes such as: access and egress, materials management, roof hazards e.g. sky lights etc, edge protection, exclusion zones and use of fall arrest or fall restraint equipment etc. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Compliance to relevant Codes of Practice e.g. Safe Work on Roofs 2009, Managing the risk of falls in the workplace etc. Loading and unloading arrangements approved by ADCO. Methodology and controls to be monitored in accordance with SWMS. Workers inducted to SWMS and Daily Prestarts	L(D4)					ACTIVE
Roofing	Unqualified / incompetent personnel	Resulting in incidents, injuries and poor decision making	H(C1)	The lead supervisor managing the works must hold Roof Plumbing Licence. All workers must have Working at Heights Training completed. Training required for the use of fall prevention equipment. Workers must be provided appropriate training or instruction which can include: • roofing methods, tasks, activities • control measures to minimise exposure to risks • safe working procedures, including use of mechanical aids and devices etc Some workers will need to hold the appropriate high-risk work licences as determined by the activities. ADCO recommend that all workers undergo Manual Handling Training. Workers inducted to SWMS and Daily Prestarts High Risk Workshop to be undertaken with ADCO/Client and Contractor prior to works authorisation.	L(D4)					ACTIVE
Roofing	Work at heights	Workers falling	H(C1)	EWP's to be used in accordance with safe working instructions. WLL's to be adhered at all times. No stepping out or over railings etc from EWP's or Work Boxes. Use of fall arrest/fall restraint equipment is discouraged where possible (last resort) Exclusion zones must be established, managed and sign posted to warn workers and others of danger above. Work at Heights Training. Material to be secued to roof when not in use	L(D4)					ACTIVE

SAFETY ASSESSMENT

ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Roofing	Work at heights	Materials falling	H(C1)	Exclusion zones must be established, managed and sign posted to warn workers and others of danger above. Ensure controls are in place to prevent persons or materials falling from height. Use spotters to assist in keeping workers and others out of harms way. Certified personnel to undertake all lifting duties. Tool and Equipment Layards to be used. Portable Scaffolding not to be set up in proximity to designated walkways. Materials to be stored away from Live edges and secured to roof when not in use	L(D4)					ACTIVE
Roofing	Manual handling	Musculoskeletal disorders	H(C1)	Due to the nature of roofing, manual handling is a major risk factor to injuries. Subcontractors undertaking scaffolding activities should have manual handling training provided for their employees. Such training is provided from time to time by ADCO and is available for subcontractors. Conduct regular housekeeping to ensure clear passage	L(D4)					ACTIVE
Roofing	Cranage	Crush injuries	H(C1)	Correct lifting techniques must be used including lifting gear. Certified personnel to undertake all lifting duties. Exclusion zones must be established for all lifting. Permits to be sought from and approved by ADCO for mobile crane lifts.	L(D4)					ACTIVE
Roofing	Unprotected public spaces near boundaries	Injuries to public	H(C1)	Where overhead protection cannot be provided, road closures, traffic management, exclusion zones must be established at sufficient distances to protect public personnel from works above. E.g. installing perimeter screens. Where possible, B Class hoardings will be erected with appropriate KPA ratings to protect the public. Where sufficient distance is available from the building to the perimeter boundary line, an A Class hoarding or Chainwire mesh fence will be erected to protect the public. Constant monitoring of controls will be undertaken by supervisors (both ADCO and subcontractors).	L(D4)					ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Poor planning	Resulting in incidents, injuries and poor decision making	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure notifications have been completed and submitted to relevant authorities. Ensure a Geotechnical Report has been prepared for the project affecting ground conditions for scaffold. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Ensure Scaffold design drawings have been prepared and approved for use. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc. Methodology and controls to be monitored in accordance with SWMS. Workers inducted to SWMS and Daily Prestarts Designated engineer- Designer :Mark Studio and sign off : Ross Engineering. Set down area for material nominated; ADCO nominates set downs, generally east haul road pending works in area or north west haul. Deliveries to Site- Offloading methodology; 12m rigid with Hiab generally with snap straps failing that it will be ADCO telehandler which means loads strapped on stillages or the like Scaffold drawings submitted at least a week in advance to ADCO for review acceptance. ADCO to provide structural steel drawings and architectural to confirm Stretcher stair design attachment for NE stretcher access to roof to assist with design Crown to communicate to drivers and suppliers access routes to/on and from site. Bookings to be made 24 hrs advance. Adco to provide Slab loading plans to be issued to Crown Scaffold Solutions Scaffold loading bays 5 tonne platform to be engineered/signed they will have dual gate system. Protected by jersey kerbs where close to plant or vehicle pathways Site Tie register to be provided by Crown Scaffolding HammerTech management – Confirm Nominated Supervisor/s and escalation to manage observations/Prestarts etc.	L(D4)	Procedure - Work at Height Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	10/03/2022	MANDATORY REQUIREMENT	ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Workers unfamiliar with correct process including scope of works.	Resulting in incidents, injuries and poor decision making	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Compliance to relevant legislation / standards including: AS/NZS 4576:1995: Guidelines for scaffolding. Methodology and controls to be monitored in accordance with SWMS and design drawings. Erection and Stripping methodology-as per swms; exclusion zones established, works communicated at daily prestart, access ways impacted diverted planned in advance permits in place.	L(D4)					ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Unqualified / incompetent personnel	Resulting in incidents, injuries and poor decision making	H(C1)	All scaffold workers must hold a High Risk Work Licence to perform Scaffold activities. SB, SI or SA HRWL. Supervisors must hold a (SI or SA)) licence and are the only persons permitted to handover a scaffold for use. Workers must be provided appropriate training or instruction which can include: • scaffold methods, tasks, activities • control measures to minimise exposure to risks • safe working procedures, including use of mechanical aids and devices etc Some workers will need to hold the appropriate high-risk work licences as determined by the activities. ADCO recommend that all workers undergo Manual Handling Training. Trainees must provide RTO Training plan and be under supervsion to conduct assembly or dismantle works.	L(D4)					ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Mix and match components	Scaffold collapse	H(C1)	Transport operators must have competency in the operation of the specific plant. Competencies for Mobile Plant operators – check and verify prior to loading or unloading as required for site operations, alternatively: evidence the transport operator has competency for load unload. System to be installed as per approved drawings Scaffolding to be inspected y ctrnc supervsior and Aadco Site Management prior to accepting Handover.	L(D4)					ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Scaffold system failure	Scaffold collapse	H(C1)	Ensure scaffold is built to the approved drawings. Ensure any variations to the drawings are reviewed and approved by the engineer or competent person. Ensure anchors, ties and needles are installed in accordance with the detailed drawings. NO detail, NO install! Ensure torque register for anchors is maintained by the scaffolder for auditing purposes. Ensure scaffold is signed off on completion prior to use. Handover certificate and including SCAFF Tag is required. Ensure scaffold in not overloaded keeping to its WLL. Ensure regular inspections are undertaken to ensure security and stability of the scaffold. Scaffolds must be inspected by a competent person: - At all handovers. - Every 30 days after handover. • After alteration / repair / or any event likely to affect the stability of the scaffold. (flooding, wind etc) -Communicate to all workers scaffold is only to be adjusted/modified by ADCO contracted scaffolder only. • Daily Scaffolding walk prior to works commencing. Scaff shield installed on ties post erection and inspected by Supervisor. Site Tie register to be provided by Contractor Ground compaction requirements (Engineer Sign Off) prior to installation. ADCO to provide structural steel drawings and architectural to confirm Stretcher stair design attachment for NE stretcher access to roof to assist with design. Crown to provide design drawings and architectural to confirm Stretcher stair design attachment for NE stretcher access to roof to assist with design.	L(D4)					ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Fire to shade cloth over wire mesh	Injuries to workers	H(C1)	Ensure shade cloth used is has best fire retardant properties. Flammability index between 0 and 25 (where zero is the least flammable) when tested in accordance with AS 1530.2-1993. Compliance with British Standard 7955:1999 (or equivalent standard that prescribes the same test and performance criteria), or demonstrating compliance with NFPA 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.	L(D4)					ACTIVE

SAFETY ASSESSMENT

ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Work at heights	Workers falling	H(C1)	Ensure scaffold is handed over safe and free from fall hazards e.g. open penetrations, lack of edge protection, lap boards, hop ups etc. Exclusion zones must be established, managed and sign posted to warn workers and others of danger. Scaffold to be erected and dismantled in accordance with AS/NZS 4576:1995: Guidelines for scaffolding and the AS/NZS 1576 Scaffolding (Set) of standards. Ensure controls are in place to prevent persons or materials falling from height. Work at Heights Training.	L(D4)					ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Work at heights	Materials falling	H(C1)	Exclusion zones must be established, managed and sign posted to warn workers and others of danger. Ensure controls are in place to prevent persons or materials falling from height. Use spotters to assist in keeping workers and others out of harms way. Scaffold loading bays 5 tonne platform to be engineered/signed they will have dual gate system. Protected by jersey kerbs where close to plant or vehicle pathways Stretchers built to suit deck level and jumped accordingly with mesh to the outside encapsulating scaffold	L(D4)					ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Manual handling	Musculoskeletal disorders	H(C1)	Use mechanical aids where possible. Assess loads, location, hazards etc. Minimise the need to pull, push and twist loads. Manual handling training. Offloading methodology: 12m rigid with Hiab generally with snap straps failing that it will be ADCO telehandler which means loads strapped on stillages or the like	L(D4)					ACTIVE
Scaffold including: Hung Scaffold Bird Cage Scaffold Swing Stage Spur Scaffold Mobile Towers	Cranage	Crush injuries	H(C1)	Correct lifting techniques must be used including lifting gear. Certified personnel to undertake all lifting duties. Exclusion zones must be established for all lifting. Any scaff adjacent vehicle access to have jersey kerb protection.	L(D4)					ACTIVE
Site Establishment	Poor planning	Resulting in incidents, injuries and poor decision making	H(C1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure amenities meet Code of Practice and are cleaned and maintained to a high standard. Ground conditions to be assessed prior to sheds being offloaded e.g. for underground services, engineering etc. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions and any crane set up locations. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Ensure all connections are carried out by qualified tradesman. Certification of Shed Installation	L(D4)	Procedure - Site Management Procedure - Subcontractor Management Procedure - Consultation and Communication	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS		Optional	ACTIVE
Site Establishment	Public inconvenienced during establishment	Public placed at risk of injury	H(C1)	Ensure delivery of sheds are arranged in accordance with approved DA times. Ensure members of the public are not inconvenienced and are not restricted access to the existing car park. Ensure pedestrian management is in place through a TMP Traffic Management Plan. Self Closing Pedestrian Gate 1 Zebra Crossing at Gate 1 Dome Mirror at Gate 1 Tactiles at Entry Egress/Crossings at Gate 1 Secondary Fence to encompass car park and compound/ PPE Free zone. Traffic controllers and authorised TCP. Viewing Platform Fenced and isolated from public. Warning and Danger Signage for Authorised persons only.	L(D4)					ACTIVE
Site Establishment	Cranage	Crush injuries	H(C1)	Correct lifting techniques must be used including lifting gear. Certified personnel to undertake all lifting duties. Exclusion zones must be established for all lifting. Certified and Inspected Lifting Equipment Certified & Designated Lifting Pads Ticketed Dogman for loads HR SWMS Reviews Equipment acceptance Inspections Ground compaction testing	L(D4)					ACTIVE
Site Establishment	Public using sporting ground and other recreational amenities	Public injured and inconvenienced	H(C1)	Ensure members of the public are not inconvenienced and are not restricted access to the existing tennis courts etc. Public crossing areas not to be impeded or obstructed during works. Ensure pedestrian management is in place through a TMP Traffic Management Plan. Special care during sporting events is required to ensure public, kids etc are not exposed to construction activities.	L(D4)					ACTIVE
Static Plant Install & Removal - Tower Crane and Hoist etc	Poor planning	Resulting in incidents, injuries and poor decision making	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure notifications have been completed and submitted to relevant authorities. Ensure all design drawings for the tower crane, loading bays or hoists etc have been supplied. Crane lift study completed for the install and removal process. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc All workers to hold current qualification for installation. (Rigger) Supervisor to attend Daily Prestart and Toolbox all workers on risks/controls for the day.	L(D4)	Procedure - Static Plant Procedure - Work at Height Procedure - Risk Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	MANDATORY REQUIREMENT	ACTIVE
Static Plant Install & Removal - Tower Crane and Hoist etc	Workers unfamiliar with correct process including scope of works.	Resulting in incidents, injuries and poor decision making	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Methodology and controls to be monitored in accordance with SWMS. All workers to hold current qualification for installation. (Rigger).	L(D4)					ACTIVE
Static Plant Install & Removal - Tower Crane and Hoist etc	Unqualified / incompetent personnel	Resulting in incidents, injuries and poor decision making	H(C1)	A combination of High Risk Work Licences and competency based training is required for the installation of Static Plant pending the plant type. All workers to hold current qualification for installation. (Rigger).	L(D4)					ACTIVE
Static Plant Install & Removal - Tower Crane and Hoist etc	Delivery and retrieval of plant by transport company	Resulting in incidents, injuries and poor decision making	H(C1)	Transport operators must have competency in the operation of the specific plant. Competencies for Mobile Plant operators – check and verify prior to loading or unloading as required for site operations, alternatively: evidence the transport operator has completed the nationally recognized course RIIHAN308F Load and unload plant for transport operators.	L(D4)					ACTIVE
Static Plant Install & Removal - Tower Crane and Hoist etc	Suspended loads	Materials falling	H(C1)	Where practicable: exclusion zones must be established to warn workers of danger above. Dogman is responsible for directing and ensuring loads are safely secured. Where possible, loads must not lifted over workers, public areas or occupied structures etc. All lifting activities must be pre arranged/booked (where possible) the day prior with the ADCO Site Manager. All lifting equipment e.g. chains, slings etc, must be maintained and serviced in accordance with manufactures recommendations. A lifting equipment register must be maintained for all equipment used. Only certified Dogman permitted to secure loads and direct.	L(D4)					ACTIVE
Static Plant Install & Removal - Tower Crane and Hoist etc	Work at height	Workers falling	H(C1)	Ensure all works at height is undertaken in a safe work box e.g. EWP, Work Box etc. EWP's and Work Boxes etc to be used in accordance with safe working instructions. WLL's to be adhered at all times. No stepping out or over railings etc from EWP's or Work Boxes. Use of fall arrest equipment is discouraged where possible (last resort) Exclusion zones must be established, managed and sign posted to warn workers and others of danger above.	L(D4)					ACTIVE

SAFETY ASSESSMENT

ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Static Plant Install & Removal - Tower Crane and Hoist etc	Work at heights	Materials falling	H(C1)	Exclusion zones must be established, managed and sign posted to warn workers and others of danger above. Ensure controls are in place to prevent persons or materials falling from height. Use spotters to assist in keeping workers and others out of harms way. Tools and equipment to be secured by Lanyards	L(D4)					ACTIVE
Structural Steel	Poor planning	Resulting in incidents, injuries and poor decision making	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure notifications have been completed and submitted to relevant authorities. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions and any crane set up locations. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Ensure Structural steel design drawings including temporary bracing reviewed and approved. Crane lifting study plan prepared. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc. Fall Risks assessed and controlled in revolved and approved SWMS and prestarts Edge Protection in place. Handover Certificates to be received and Slab load provided to contractor prior to loading Steel and Mobile Equipment on Suspended Slabs	L(D4)	Procedure - Work at Height Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	1/05/2022	MANDATORY REQUIREMENT	ACTIVE
Structural Steel	Workers unfamiliar with correct process including scope of works.	Resulting in incidents, injuries and poor decision making	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Compliance to relevant Codes of Practice e.g. Managing the risk of falls at workplaces etc Mobile Crane set up locations confirmed and assessed for ground conditions (if applicable) Methodology and controls to be monitored in accordance with SWMS. Workers inducted to SWMS and Daily Prestarts	L(D4)					ACTIVE
Structural Steel	Unqualified / incompetent personnel	Resulting in incidents, injuries and poor decision making	H(C1)	The lead supervisor managing the works must hold a (RA or RI) High Risk Work Licence. Workers must be provided appropriate training or instruction which can include: • steel erection methods, tasks, activities • control measures to minimise exposure to risks • safe working procedures, including use of mechanical aids and devices etc Some workers will need to hold the appropriate high-risk work licences as determined by the activities. ADCO recommend that all workers undergo Work at Heights and Manual Handling Training. Training & Competency Register from Contractor confirming employees competencies (in addition to Hammtech)	L(D4)					ACTIVE
Structural Steel	System failure	Structural Steel Collapse	H(C1)	Ensure steel is erected in accordance to the approved drawings and methodology. Ensure any variations to the drawings are reviewed and approved by the engineer or competent person. Ensure any temporary bracing is installed in accordance with the detailed drawings. NO detail, NO install! Ensure any temporary bracing used, is approved by the engineer prior to removal. Ensure all connections, bolts etc are secured prior to finalising the structure. Ensure bracing is protected from tampering and mobile plant collision.	L(D4)					ACTIVE
Structural Steel	Work at heights	Workers falling	H(C1)	Ensure all works at height is undertaken in a safe work box e.g. EWP, Work Box etc. EWP's and Work Boxes etc to be used in accordance with safe working instructions. WLL's to be adhered at all times. No stepping out or over railings etc from EWP's or Work Boxes. Use of fall arrest equipment is discouraged where possible (last resort) Exclusion zones must be established, managed and sign posted to warn workers and others of danger above. Work at Height Training.	L(D4)					ACTIVE
Structural Steel	Work at heights	Materials falling	H(C1)	Exclusion zones must be established, managed and sign posted to warn workers and others of danger above. Ensure controls are in place to prevent persons or materials falling from height. Use spotters to assist in keeping workers and others out of harms way. Tool and Equipment Layards to be used. Portable Scaffolding not to be set up in proximity to designated walkways. Materials to be stored away from Live edges Materials to be stored away from Live edges	L(D4)					ACTIVE
Structural Steel	Manual handling	Musculoskeletal disorders	H(C1)	Use mechanical aids where possible. Assess loads, location, hazards etc. Minimise the need to pull, push and twist loads. Manual handling training.	L(D4)					ACTIVE
Structural Steel	Cranage	Crush injuries	H(C1)	Correct lifting techniques must be used including lifting gear. Certified personnel to undertake all lifting duties. Exclusion zones must be established for all lifting. Permits to be sought and approved for lifts All Lifting equipment Tested/Inspected and maintained	L(D4)					ACTIVE
Suspended Formwork	Poor planning	Resulting in incidents, injuries and poor decision making	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure notifications have been completed and submitted to relevant authorities. Ensure formwork design drawings have been prepared and approved for use. Any proprietary systems used to be certified e.g. Perri, Table Form etc. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions and any crane set up locations. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc. HR Workshop	L(D4)	Procedure - Suspended Formwork Procedure - Work at Height Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	20/02/2022	MANDATORY REQUIREMENT	ACTIVE
Suspended Formwork	Workers unfamiliar with correct process including scope of works.	Resulting in incidents, injuries and poor decision making	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Compliance to relevant Codes of Practice e.g. Formwork Ensure any proprietary formwork systems are approved and instructions provided for construction. Methodology and controls to be monitored in accordance with SWMS and Geotechnical Report including shoring requirements etc. Daily Prestart Toolboxes to be conducted by Contractors Workers inducted to SWMS and Daily Prestarts	L(D4)					ACTIVE
Suspended Formwork	Unqualified / incompetent personnel	Resulting in incidents, injuries and poor decision making	H(C1)	Supervisors must hold a Trade Certificate in (Carpentry) or Nationally Recognised Cert 3 Formwork / Falsework. Workers must be provided appropriate training or instruction which can include: • formwork methods, tasks, activities • control measures to minimise exposure to risks • safe working procedures, including use of mechanical aids and devices etc. Some workers will need to hold the appropriate high-risk work licences as determined by the activities.	L(D4)					ACTIVE
Suspended Formwork	Formwork systems	Formwork collapse	H(C1)	ADCO recommend that all workers undergo Work at Height and Manual Handling Training. Ensure engineered approved design drawings are provided and reviewed prior to commencing. Ensure cross use of equipment is designed and approved by a certified engineer. Ensure any variations are approved by the certified engineer. Ensure any lifting lugs e.g. to shutters etc, are engineered and approved. Ensure a pre pour certificate is provided prior to concrete pour on or in structural elements. Independent Third Party Audit to be initiated by ADCO on Multilevel Form Work Systems and Perimeter Screens	L(D4)					ACTIVE

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ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Suspended Formwork	Temporary works	Failings of temporary works	H(C1)	All temporary works must be assessed and designed by a qualified structural engineer. Propping, bracing, shoring etc, must be installed in accordance with the engineers instructions by a competent person. Removal of any temporary works e.g. propping, must have prior approval by the engineer.	L(D4)					ACTIVE
Suspended Formwork	Work at heights	Workers falling	H(C1)	Decks to be handed over safe and free from fall hazards e.g. open penetrations, lack of edge protection etc. Exclusion zones must be established, managed and sign posted to warn workers and others of danger. Ensure controls are in place to prevent persons or materials falling from height. Catch decks to be installed and used in accordance with COP. Work at Heights Training. Leading Edge to be protected Temporary handrails.	L(D4)					ACTIVE
Suspended Formwork	Work at heights	Materials falling	H(C1)	Exclusion zones must be established, managed and sign posted to warn workers and others of danger. Ensure controls are in place to prevent persons or materials falling from height. Use spotters to assist in keeping workers and others out of harms way. Temporary decks loaded with materials must be designed and engineered. Designated access under formwork deck Exclusion zones with signage in place where risk is present. No Drop Stripping	L(D4)					ACTIVE
Suspended Formwork	Manual handling	Musculoskeletal disorders	H(C1)	Use mechanical aids where possible. Assess loads, location, hazards etc. Minimise the need to pull, push and twist loads. Manual handling training.	L(D4)					ACTIVE
Suspended Formwork	Cranage	Crush injuries	H(C1)	Correct lifting techniques must be used including lifting gear. Certified personnel to undertake all lifting duties. Exclusion zones must be established for all lifting. Housekeeping on Decks - establish clear paths for movement Workers staying clear of loads. No High/Low multi-slung loads. Bulker Bags to be loaded directly to bins with SWL before craning to decks	L(D4)					ACTIVE
Traffic Management (External) - traffic and pedestrian control	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure controls, methodology is monitored in accordance with SWMS. Both traffic management and traffic movement plans must be prepared and current for site conditions. Ensure licencing and worker competency is checked and verified prior to commencement of works. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc Prior to commencing work, the project team and relevant subcontractor must discuss and agree on the following: - Scope of works - Development of traffic management plans - Night works on roads - Traffic control requirements – on or off site - Travel paths for mobile plant and pedestrians - Services, road, lane or footpath closures etc - Services e.g. bus routes, taxi stands, school zone - Who is responsible for traffic management duties etc. Only approved traffic controllers to management external traffic or pedestrians. Traffic control signage must be installed in accordance with approved TMP's. Exclusion zones must be established, managed and sign posted to warn workers and others of danger. Spotters must be used in highly populated areas or risk based e.g. reversing trucks Deliveries and Picks up to be booked with ADCO Site Manager at least 24 Hours in advance.	L(D4)	Procedure - Traffic Management and Movement Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	MANDATORY REQUIREMENT	ACTIVE
Traffic Movement (Internal) - within site boundaries	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Trafficable paths must be identified via clear delineation including signage, barriers etc. Information pertaining to the activity must be discussed with workers through consultative processes. Both traffic management and traffic movement plans must be prepared and current for site conditions. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions and any vehicle or mobile plant paths. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc Prior to commencing work, the project team and relevant subcontractor must discuss and agree on the following: - Traffic paths (e.g. pedestrians, vehicles, mobile plant, entry point, gate numbers, etc) including speed limits - Service locations within or adjacent to trafficable areas - Exclusion zones - kPa ratings of engineered surfaces - Location of facilities - Emergency management - Storage and refuelling areas Exclusion zones must be established, managed and sign posted to warn workers and others of dangers. Spotters must be used in highly populated areas or risk based. High risk work must be segregated or isolated to protect workers and onsite movement of vehicles and mobile plant. Structural components must be protected from vehicle / plant impact e.g. temporary supports, building structure etc. Services must be mechanically protected from vehicle/plant impact. Power boards must be protected from vehicle/plant impact. Refuelling must be conducted in line with ADCO instructions and location. Dedicated delivery area included on site inductions and posted on Site Notice Board.	L(D4)	Procedure - Traffic Management and Movement Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	Optional	ACTIVE
Unexpected finds	Unexpected Finds Protocol (as required) e.g. Asbestos	Incorrect or poor work practices resulting in exposure and illness	H(C1)	Unexpected Finds - Any suspected ACM found during works must be managed and controlled by: 1. Stop work in the immediate area ASAP. 2. Report finding to ADCO Supervisor immediately. 2. Advise workers of the potential danger and control measures. 3. Establishing an exclusion zone around the affected area. 4. Cover the suspected material. 5. Keeping material damp or wet. 6. Arrange for suspected material to be tested. 7. Notify relevant authorities (as required) 9. Arranging for the material to be removed to an approved facility. 9. Remove in accordance assessors directions. 10.Copies of waste disposal receipts to be obtained. 11.Clearance certificate to be provided. Requirements contained in Hammertech inductions	L(D4)		ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS			ACTIVE
Use of Temporary Support Systems	Poor planning and selection of crane	Incorrect or poor work practices resulting potential incidents.	E(B1)	Separate risk assessment to be undertaken to determine potential issues with unauthorised access points, method of security and protection, erection point etc. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc	L(D4)	Procedure - Demolition Procedure - Suspended Formwork Procedure - Risk Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	1/05/2022		ACTIVE

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ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Use of Temporary Support Systems	Collapse of Temporary Support	Injury to person/Damage to Property	E(B1)	Ensure Hierarchy of Controls for work at height is considered and adopted where practicable. Trestles over 1.5 Meters are to have hand and mid rails fitted. Formwork Systems confirmed as compliant with Australian Standards.(Faresin systems i.e.AluFLEX and AluFORT) Prepour Inspections to be conducted by ADCO Contractor Nominated engineer to provide signed Handover certificates to ADCO prior to allowing works to be conducted on Decks. (be Partial or Permanent Handover Certificates that specify deck loading ratings, confirmed propping and call out specifically PT coils.) Perimeter Screen to be installed IAW Primeform Proposal 3 (HR Workshop) and decks extended to 1 meter as detailed in HR workshop proposal 2.	L(D4)	Procedure - Site Management Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	4/04/2022		ACTIVE
Work Around Live Services	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure controls, methodology is monitored in accordance with SWMS. Ensure worker competency is checked prior to works commencing. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc ADCO ATW Permit to be sought and approved prior to works commencing	L(D4)	Procedure - Work Around Live Services Procedure - Site Management Procedure - Risk Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	15/03/2022	MANDATORY REQUIREMENT	ACTIVE
Work Around Live Services	Inground services	Contact with services	H(C1)	Ensure as built drawings are acquired and reviewed prior to works. Ensure where services are known, they are isolated or disconnected prior to works. Ensure spotters are used when working within 500mm from any live service e.g. power or gas. Where service is of high danger e.g. high voltage power, gas or fuel lines, non destructive removal of spoil MUST be considered and discussed with ADCO Management prior to works commencing. ADCO ATW Permit to be sought and approved prior to works commencing. Isolation of Services to be conducted prior to works occurring via LOTO	L(D4)					ACTIVE
Work Around Live Services	Above ground services	Contact with services	H(C1)	Ensure overhead services are identified prior to works. Pending service type e.g. power, ensure certified spotters are used for power as per legislative requirements. Where possible have service isolated or protected from potential impact.	L(D4)					ACTIVE
Work at Height - Protective Hoardings - erection and dismantling	Poor planning	Resulting in incidents, injuries and poor decision making	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Ensure all notifications have been completed and submitted to relevant authorities. Ensure all design drawings have been supplied. Ensure a Geotechnical Report has been prepared for the project in relation to ground conditions and any crane set up locations. Note: ensure that post rain events of 25mm or greater are re inspected for ground stability. Current approved drawings should be supplied to contractor or made available through ACONEX etc.	L(D4)	Procedure - Work at Height Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	1/05/2022	MANDATORY REQUIREMENT	ACTIVE
Work at Height - Protective Hoardings - erection and dismantling	Workers unfamiliar with correct process including scope of works.	Resulting in incidents, injuries and poor decision making	H(C1)	Information pertaining to the activity must be discussed with workers through consultative processes such as: access and egress, materials management, roof hazards e.g. sky lights etc, edge protection, exclusion zones and use of fall arrest or fall restraint equipment etc. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Compliance to relevant Codes of Practice e.g. National Code of Practice for Pre Cast and Tilt Up. Loading and unloading arrangements approved by ADCO. Methodology and controls to be monitored in accordance with SWMS. Mobile Crane set up locations confirmed and assessed for ground conditions (if applicable)	L(D4)					ACTIVE
Work at Height - Protective Hoardings - erection and dismantling	Work at height	Workers falling	H(C1)	Ensure all works at height is undertaken in a safe work box e.g. EWP, Work Box etc. EWP's and Work Boxes etc to be used in accordance with safe working instructions. WLL's to be adhered at all times. No stepping out or over railings etc from EWP's or Work Boxes. Use of fall arrest equipment is discouraged where possible (last resort) Exclusion zones must be established, managed and sign posted to warn workers and others of danger above.	L(D4)					ACTIVE
Work at Height - Protective Hoardings - erection and dismantling	Work at heights	Materials falling	H(C1)	Exclusion zones must be established, managed and sign posted to warn workers and others of danger above. Ensure controls are in place to prevent persons or materials falling from height. Use spotters to assist in keeping workers and others out of harms way. Alter worker/Pedestrian and traffic from area where possible	L(D4)					ACTIVE
Work at Height - Protective Hoardings - erection and dismantling	Unprotected public spaces near boundaries	Injuries to public	H(C1)	Where overhead protection cannot be provided, road closures, traffic management, exclusion zones must be established at sufficient distances to protect public personnel from works above. E.g. installing perimeter screens. Where possible, B Class hoardings will be erected with appropriate KPA ratings to protect the public. Where sufficient distance is available from the building to the perimeter boundary line, an A Class hoarding or Chainwire mesh fence will be erected to protect the public. Constant monitoring of controls will be undertaken by supervisors (both ADCO and subcontractors).	L(D4)					ACTIVE
Work on Live Services - approved in accordance with WHS legislation (Only)	Poor planning and selection of crane	Incorrect or poor work practices resulting potential incidents.	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Separate risk assessment to be undertaken to determine potential issues with unauthorised access points, method of security and protection, erection point etc. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc Isolation of Services to be conducted prior to works occurring via LOTO	L(D4)	Procedure - Work Around Live Services Procedure - Site Management Procedure - Risk Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	MANDATORY REQUIREMENT	ACTIVE
Work on Live Services - approved in accordance with WHS legislation (Only)	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	H(C1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure controls, methodology is monitored in accordance with SWMS. Ensure worker competency is checked prior to works commencing. Isolation of Services to be conducted prior to works occurring via LOTO Works controlled by ADCO Authority to Work Permit	L(D4)					ACTIVE
Worker Bullying and Harassment	Role overload or underload Exposure to traumatic events Role conflict or lack of role clarity Conflict or poor workplace relationships between workers, supervisors and managers Poor support from supervisors and managers Workplace violence Bullying Harassment including sexual harassment Inadequate reward and recognition Hazardous physical environments Remote or isolated work Poor procedural controls (processes for making	Psychosocial Hazards - Worker stress Mental breakdown Suicide	E(B1)	Employers must consult with manager, supervisors, workers and address poor workplace relationships including role overload or underload. Employers should have EAP on hand for workers to deal with traumatic events i.e. counselling etc Employers should clarify job descriptions and responsibilities with all employees. Employers must address conflict ASAP and resolve any festering issues between workers, supervisors and managers. Employers must provide the necessary support to its workforce both financially and resource. Employers must have a zero tolerance to bullying, harassment and violence in the workplace. Employers should have a bullying and harassment policy. Employers should recognise worker performance. Employers should be conscious of remote workers i.e. remote country areas etc. Employers should have a inhouse disciplinary process that is fair and not discriminate. Employers must consultate where possible on all aspects of the business with its workforce etc.	L(D4)	Discrimination and Harassment Policy Diversion and Inclusion Policy Grievance Policy	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS			ACTIVE

SAFETY ASSESSMENT										
ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Working Adjacent to Road / Railway or other traffic corridor	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the Principal. Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure controls, methodology is monitored in accordance with SWMS. Ensure licencing and worker competency is checked and verified prior to commencement of works.	L(D4)	Procedure - Risk Management Procedure - Subcontractor Management Procedure - Site Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	MANDATORY REQUIREMENT	ACTIVE
Working Adjacent to Road / Railway or other traffic corridor	Working on or adjacent to roadway		H(C1)	Ensure any works external to the project site are carried out with adequate traffic and pedestrian management, and IAW RMS "Traffic Control at Work Sites Manual". External works affecting traffic or pedestrians must follow the requirements of an approved traffic management plan. Persons undertaking traffic management activities must be certified and competent. External works must be approved by ADCO Management. No materials are to be left in public areas unsecured or over night. All public hazards e.g. road plates, barriers etc must be fit for purpose and not pose a risk of injury. Site Internal Traffic Management Plan communicated to Traffic controllers	L(D4)					ACTIVE
Working Around Mobile Plant	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Information pertaining to the activity must be discussed with workers through consultative processes. SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure controls, methodology etc is monitored in accordance with SWMS. Mobile plant has right of way due to poor visibility of operators. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc	L(D4)	Procedure - Operating Plant Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	Optional	ACTIVE
Working Around Mobile Plant	Workers working near mobile plant	Persons struck by plant	H(C1)	Workers must keep clear of plant in operation and where possible be in the line of sight with the operator. Where practicable; exclusion zones must be established to warn workers of plant danger. Where exclusion zones are not in place, spotters must be used. Never work with back to plant. Always advice operator of your presence. Caution of swing radius from Excavators, Cranes, Telehandlers etc. Do not attempt to approach operator via BLIND SIDE of the plant. Always wait till operator gives a single to approach plant. Never work with back to plant. Always advice operator of your presence. Wear high viz clothing. Plant to be isolated/keys removed and cabin locked (Where applicable) when not in use by qualified operator. Ensure Amber caution lights and travel alarms are operational daily during prestart inspections	L(D4)					ACTIVE
Working Around Mobile Plant	Fumes	Poisoning	H(C1)	Ensure plant is fit for purpose and the ventilation is assessed on selection of plant. Internal use of fuel driven plant is prohibited without ADCO review of assessment and controls.	L(D4)					ACTIVE
Working at Height < than 2 meters: platform ladders, trestles etc	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure controls, methodology is monitored in accordance with SWMS. Ensure Platform Ladders are used. Step ladders are prohibited. Ensure only proprietary items are used such as trestles, platform ladders Ensure items are Industrially Rated 120Kg and above.	L(D4)	Procedure - Risk Management Procedure - Subcontractor Management Procedure - Site Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	Optional	ACTIVE
Working at Height < than 2 meters: platform ladders, trestles etc	Work at height	Workers falling	H(C1)	Ensure instruction and training has been provided for the use of equipment. Ensure Platform Ladders above 2 meters have a swing bar or chain to prevent falls. Ensure Trestles are 450mm wide and not extended beyond capacity. Ensure neither Platform Ladders or Trestles are used over voids, stairs, balconies etc	L(D4)					ACTIVE
Working at Height > than 2 meters:	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure controls, methodology is monitored in accordance with SWMS. Ensure Hiarchary of Controls for work at height is considered and adopted where practicable. Ensure Work @ Heights Training has been provided where required / based on activity. Trestles over 1.5 Meters are to have hand and mid rails fitted. Formwork Systems confirmed as compliant with Australian Standards.(Faresin systems i.e.AluFLEX and AluFORT) Prepour Inspections to be conducted by ADCO Contractor Nominated engineer to provide signed Handover certificates to ADCO prior to allowing works to be conducted on Decks. (be Partial or Permanent Handover Certificates that specify deck loading ratings, confirmed propping and call out specifically PT coils.) Stretcher Stair access provided at North and South of Structure by ADCO. Drawing provided to Transform. Prepour Inspections to be conducted by ADCO. Perimeter Screen to be installed IAW Primeform Proposal 3 (HR Workshop) and decks extended to 1 meter as detailed in HR workshop proposal 3. Independent Third Party Audit to be initiated by ADCO on Multilevel Form Work Systems and Perimeter Screens	L(D4)	Procedure - Risk Management Procedure - Subcontractor Management Procedure - Site Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	11/05/22	MANDATORY REQUIREMENT PENDING ACTIVITY	ACTIVE
Working at Height > than 2 meters:	Work at height	Workers falling/Collapse of Access or Fall prevention Systems	H(C1)	Ensure instruction and training has been provided for the use of equipment e.g. fall restraint etc. Where possible, undertake works on ground. Use proprietary edge protection where possible. Scaffolding and EWP's where possible. Ensure Platform Ladders are used. Step ladders are prohibited. Ensure only proprietary items are used such as trestles, platform ladders Ensure items are Industrially Rated 120Kg and above.	L(D4)					ACTIVE

SAFETY ASSESSMENT										
ACTIVITY / TASK	ANTICIPATED HAZARDS	RISK OUTCOME	IR	RISK MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Works in Restricted Areas e.g. tunnels etc	Workers unfamiliar with correct process and scope of works.	Incorrect or poor work practices	E(B1)	Work activity sequencing must be planned and approved by ADCO in conjunction with the contractor. Information pertaining to the activity must be discussed with workers through consultative processes. Current approved drawings, management plans, risk registers etc are made available through ACONEX etc SWMS must be supplied to ADCO detailing the methodology and control measures prior to works. Ensure controls, methodology is monitored in accordance with SWMS. Ensure licencing and worker competency is checked and verified prior to commencement of works. Ensure any approvals required have been obtained. A minimum of two workers must works together at all times. Additional spotters should be used based on risk assessment. Communication systems between workers, spotters and supervisors must be provided. Ensure access and egress is suitable for workers and for emergency situations. Ensure regular inspections are undertaken throughout the shift and that a post work inspection is completed to ensure no hazard remains.	L(D4)	Procedure - Site Management Procedure - Risk Management Procedure - Subcontractor Management	ADCO CONSTRUCTIONS PTY LTD RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	MANDATORY REQUIREMENT	ACTIVE

ENVIRONMENTAL ASSESSMENT

ACTIVITY & ASPECT	ASPECT OUTCOME	IR	IMPACT MANAGEMENT / CONTROL	RR	DOCUMENT / REFERENCE	RESPONSIBILITY	HIGH RISK WORKSHOP	PERMIT TO WORK	STATUS OF ACTIVITY
Site Establishment and Use of Project Offices	Increase in environmental impact and associated cost with disposal / recycling	M(M3)	<ul style="list-style-type: none">* Where possible; use electronic devices for communications.* Where possible; use recycled paper.* Lights only to be turned on as required.* Use long life globes (low voltage where possible)* Switch off all lights on departure from office* Doors to be closed when cooling / heating is used.* General waste to be disposed of in appropriate designated waste facilities.* Use environmentally friendly cleaning products for amenities cleaning.	L(D3)	Site Management Subcontractor Management	ADCO CONSTRUCTIONS RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	Optional	ACTIVE
Vegetation Clearing / Revegetation (as required)	Decrease in air and water quality Build-up of sediment in water systems from land run off Introduction of invasive species	M(M3)	<p>Clearing</p> <ul style="list-style-type: none">* Clearing methods to follow approved (DA or other) procedures.* Trees (including root zones where possible) to be retained will be identified with visible warning tape (at 900 mm above ground) to ensure that workers are aware of their presence and they are not inadvertently damaged.* Limited disturbance of ground covers to excavation areas.* No burning off-on site.* Stockpile excavated material into areas which have no impact on the eco system.* Stockpiles to be vegetated (where practicable) to improve soil stability.* Vegetative material brought to site to meet appropriate standards and be free of debris, seeds, etc.* Noxious or banned vegetative material to be segregated and removed from site.* Appropriate control measures to be installed to ensure containment of disturbed areas and stockpiles.* Dust mitigation to be implemented as required.* Daily inspections and inspections following a major weather event (i.e. storm, high wind).* Work activity locations to be identified on the Traffic Movement Plan.* Environmental management requirements will be included in the Site Induction. <p>Revegetation</p> <ul style="list-style-type: none">* Vegetative material brought to site to meet appropriate standards and be free of debris, seeds, etc.* Landscaping so far as is practicable is to be completed as soon as possible after disturbance in accordance with the approved landscaping plans.* Revegetated areas to be excised to prevent unauthorised access or damage by animals, unauthorized persons or workers.* Areas of revegetation are to be inspected monthly by an accredited horticulturist to ensure that no weed infestation has occurred* Noxious or banned vegetative material prohibited from being brought to the project site	L(D3)	Environmental Management GR - Contaminants Erosion and Sediment Management Fauna and Flora Management Site Management Subcontractor Management	ADCO CONSTRUCTIONS RELEVANT SUBCONTRACTORS	To be decided by project team and recorded based on risk profile	Optional	ACTIVE

EMERGENCY PREPAREDNESS

Emergency Situation	Potential Injuries	Action / Response	Emergency Provisions
PSYCHOSOCIAL HAZARDS - Mental Health	A psychosocial hazard is any hazard that affects the mental well-being or mental health of the worker by overwhelming individual coping mechanisms and impacting the worker's ability to work in a healthy and safe manner	<p>Risk Management in relation to psychosocial health, safety and wellbeing involves four steps</p> <ol style="list-style-type: none"> 1. Identify psychosocial hazards – find out what could cause harm, considering recognised psychosocial hazards. 2. Assess risks if necessary – understand the nature of the harm that could be caused by the psychosocial hazards. 3. Control risks – implement the most effective control measures that are reasonably practicable in the circumstances. 4. Review hazards and control measures to ensure they are working as planned. <p>Provide Alcohol / Drugs Awareness training to employees and workers. Provide Mental Health Awareness training to employees and workers. Provide Suicide Awareness training to employees and workers. Establish a EAP for employees. Ensure other workers e.g. subcontractors have a similar programme for their workers.</p>	<p>Procedure - Health Management</p> <p>Emergency - 000 Beyond Blue - 1300 22 4636 Lifeline - 131 114 MIC - 1300 642 111</p>
Public personnel struck by construction vehicle or materials during construction works	Crush injuries Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	<p>Response – is the casualty conscious? Do they respond when you talk to them, touch their hands etc. Do not move casualty unless absolutely necessary e.g. in imminent danger or not breathing etc. Keep casualty still and support head and neck (as per first aid training) Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with casualty until help arrives.</p> <p>Airway – Is the casualties airway clear? Is the casualty breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) Do not use (AED) on children without advise from 000 first. (AED) located in ADCO First Aid Shed/Office. Treat any sever bleeding (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure casualty and assist emergency services if possible Record and investigate incident and notify as per legal requirements.</p>	<p>Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator</p>
Major structural collapse e.g. formwork deck etc	Crush injuries Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	<p>ADCO Site Manager or other worker to call 000 immediately. Where safe to do so, evacuate workers or public away from carpark to corner of (Winders Lane and Simmons Street). ADCO Chief Warden to take control of situation (as far as practicable) Other ADCO personnel to assist Chief Warden per instructions. Treat injured personnel where possible. Secured any live services affected. Notify ADCO Critical Management Team (Head Office) Await for emergency services. Do not place workers or any persons at risk by re entering the building. Follow emergency services instructions. Record and investigate incident and notify as per legal requirements.</p>	<p>Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator Critical Management Team ready to assist from Head Office</p>

EMERGENCY PREPAREDNESS

Emergency Situation	Potential Injuries	Action / Response	Emergency Provisions
Major collapse of static plant e.g. tower crane, hoist or loading platforms etc	Crush injuries Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	ADCO Site Manager or other worker to call 000 immediately. Where safe to do so, evacuate workers or public away from carpark to corner of (Winders Lane and Simmons Street). ADCO Chief Warden to take control of situation (as far as practicable) Other ADCO personnel to assist Chief Warden per instructions. Treat injured personnel where possible. Secure any live services affected. Notify ADCO Critical Management Team (Head Office) Await for emergency services. Do not place workers or any persons at risk by re entering the building. Follow emergency services instructions. Record and investigate incident and notify as per legal requirements.	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator Critical Management Team ready to assist from Head Office
Worker struck by vehicle while undertaking traffic management duties etc	Crush injuries Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	Danger – always check the danger to you, any bystanders and then the injured or ill person. Note: ensure roadway and other vehicles and pedestrians are managed and kept clear of incident sight. Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Do not move worker unless absolutely necessary e.g. in imminent danger or not breathing etc. Keep worker still and support head and neck (as per first aid training) Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with worker until help arrives. Airway – Is the person’s airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any sever bleeding (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible Record and investigate incident and notify as per legal requirements.	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
Worker struck by vehicle or mobile plant on site etc	Crush injuries Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	Danger – always check the danger to you, any bystanders and then the injured or ill person. Note: ensure other vehicles and workers are managed and kept clear of incident sight. Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Do not move worker unless absolutely necessary e.g. in imminent danger or not breathing etc. Keep worker still and support head and neck (as per first aid training) Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with worker until help arrives. Airway – Is the person’s airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any sever bleeding (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible Record and investigate incident and notify as per legal requirements.	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator

EMERGENCY PREPAREDNESS

Emergency Situation	Potential Injuries	Action / Response	Emergency Provisions
Worker struck by moving mobile plant e.g. excavator, EWP, forklift etc	Crush injuries Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	<p>Danger – always check the danger to you, any bystanders and then the injured or ill person. Note: ensure worker are managed and kept clear of incident sight. Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Do not move worker unless absolutely necessary e.g. in imminent danger or not breathing etc. Keep worker still and support head and neck (as per first aid training) Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with worker until help arrives. Airway – Is the person's airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any sever bleeding (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible. Record and investigate incident and notify as per legal requirements.</p>	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
Worker struck by falling objects	Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	<p>Danger – always check the danger to you, any bystanders and then the injured or ill person. Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Do not move worker unless absolutely necessary e.g. in imminent danger or not breathing etc. Keep worker still and support head and neck (as per first aid training) Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with worker until help arrives. Airway – Is the person's airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any sever bleeding (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible. Record and investigate incident and notify as per legal requirements.</p>	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
Worker falling from heights > 2 meters	Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	<p>Danger – always check the danger to you, any bystanders and then the injured or ill person. Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Do not move worker unless absolutely necessary e.g. in imminent danger or not breathing etc. Keep worker still and support head and neck (as per first aid training) Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with worker until help arrives. Airway – Is the person's airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any sever bleeding (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible +C7:C8</p>	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator

EMERGENCY PREPAREDNESS

Emergency Situation	Potential Injuries	Action / Response	Emergency Provisions
Worker falling from working platforms e.g. Trestles, Platform Ladders	Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	Danger – always check the danger to you, any bystanders and then the injured or ill person. Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Do not move worker unless absolutely necessary e.g. in imminent danger or not breathing etc. Keep worker still and support head and neck (as per first aid training) Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with worker until help arrives. Airway – Is the person's airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any sever bleeding (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible. Record and investigate incident and notify as per legal requirements.	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
Worker electric shock / electrocution	Breathing stopped Heart stopped Unconscious Burns	Danger – always check the danger to you, any bystanders and then the injured or ill person. Ensure live power is isolated before treating worker. Note: Consult with site electrician immediately to ensure electrical hazards are isolated or made safe prior to touching or getting close to worker. Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with worker until help arrives. Airway – Is the person's airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any visual burns. (as per first aid training) Re assure worker and assist emergency services if possible. Record and investigate incident and notify as per legal requirements.	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator

EMERGENCY PREPAREDNESS

Emergency Situation	Potential Injuries	Action / Response	Emergency Provisions
Worker trapped due to excavation collapse	Breathing stopped Heart stopped Unconscious	Danger – always check the danger to you, any bystanders and then the injured or ill person. Ensure other embankments are stable prior to rescue. Note: Consult with civil contractor or engineer immediately to ensure area is safe prior to recovery. Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Once worker is extracted (to be determined by emergency services) Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Airway – Is the person's airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any other injuries (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible. Record and investigate incident and notify as per legal requirements.	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
Worker electrocuted (Additional)	Breathing stopped Heart stopped Unconscious Burns	REMAIN CALM - Do not panic! and NOTIFY: Alert the First Aid Officer(s). Alert your Manager. Alert the Ambulance Service where instructed. CONDITIONS:	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
		ASSESS: Danger – to you, to others, to the patient, i.e. is the patient still connected to the electrical supply or is ponded water or other material in the area that may conduct electricity. Response – conscious or unconscious? Send - for help (emergency services) as early as possible. Airway – clear of objects and open?	
		ACTION PLAN: Check if the patient is still connected to the electrical supply (the human body is an excellent conductor) or water ponded in the area can also conduct electricity Turn off the electrical supply. Call emergency services.	
		REPORTING: Report in line with the requirements containing within the Incident Reporting and Management Procedure	

EMERGENCY PREPAREDNESS

Emergency Situation	Potential Injuries	Action / Response	Emergency Provisions
Worker trapped due to mobile plant roll-over e.g. excavator	Crush injuries Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	<p>Danger – always check the danger to you, any bystanders and then the injured or ill person. Note: Where possible, crushing forces should be removed from the casualty as soon as possible before toxic build up in the system. Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Once worker is extracted (to be determined by emergency services) Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Airway – Is the person’s airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any other injuries (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible. Record and investigate incident and notify as per legal requirements.</p> <p>NO MENTION OF Roll Over Protective Structure - DOES the Plant pre-start induction pick this up</p>	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
Worker crushed by heavy construction material or plant e.g. structure collapse etc	Crush injuries Neck Injury Head Injury Fractures Lacerations Unconscious Major blood lose	<p>Danger – always check the danger to you, any bystanders and then the injured or ill person. Note: Where possible, crushing forces should be removed from the casualty as soon as possible before toxic build up in the system. Response – is the person conscious? Do they respond when you talk to them, touch their hands etc. Do not move worker unless absolutely necessary e.g. in imminent danger or not breathing etc. Keep worker still and support head and neck (as per first aid training) Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor. Stay with worker until help arrives. Airway – Is the person’s airway clear? Is the person breathing? Breathing – check for breathing by looking for chest movements (up and down). CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training) Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available. Treat any sever bleeding (as per first aid training) Immobilise any visual fractures (as per first aid training) Re assure worker and assist emergency services if possible Record and investigate incident and notify as per legal requirements.</p>	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator

EMERGENCY PREPAREDNESS

Emergency Situation	Potential Injuries	Action / Response	Emergency Provisions
<p>Worker has medical episode such as:</p> <p>Hypoglycaemia is a condition in which your blood sugar (glucose) level is lower than normal. Glucose is your body's main energy source. Hypoglycaemia is often related to diabetes treatment.</p> <p>Epilepsy is a long-term brain condition where a person has repeated seizures.</p> <p>Low blood pressure include light-headedness, dizziness, and fainting.</p>	Unconscious Disorientated Radical Behaviour Seizures	<p>Danger – always check the danger to you, any bystanders and then the injured or ill person.</p> <p>Note: Check with worker if any medication is taken or needed.</p> <p>Response – is the person conscious? Do they respond when you talk to them, touch their hands etc.</p> <p>Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor.</p> <p>Stay with worker until help arrives.</p> <p>Keep worker safe.</p> <p>Airway – Is the person's airway clear? Is the person breathing?</p> <p>Breathing – check for breathing by looking for chest movements (up and down).</p> <p>CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training)</p> <p>Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available.</p> <p>Re assure worker and assist emergency services if possible</p> <p>Record and investigate incident and notify as per legal requirements.</p>	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
<p>Major laceration or amputation due to use of power saws, grinders, plant incidents etc.</p>	Lacerations Amputation Unconscious Major blood lose	<p>Danger – always check the danger to you, any bystanders and then the injured or ill person.</p> <p>Note: Where possible apply pressure over wound including ice pack to stem bleeding.</p> <p>Send for help – call triple zero (000) and alert ADCO First Aid Officer or Supervisor.</p> <p>Response – is the person conscious? Do they respond when you talk to them, touch their hands etc.</p> <p>Airway – Is the person's airway clear? Is the person breathing?</p> <p>Breathing – check for breathing by looking for chest movements (up and down).</p> <p>CPR (cardiopulmonary resuscitation) – if an adult is unconscious and not breathing, make sure they are flat on their back and commence CPR (as per first aid training)</p> <p>Defibrillator – for unconscious adults who are not breathing, apply an automated external defibrillator (AED) if one is available.</p> <p>Re assure worker and assist emergency services if possible.</p> <p>Record and investigate incident and notify as per legal requirements.</p>	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
<p>Poisoning due to the use of substances e.g. flammable goods, corrosive products etc.</p>	Poisoning Unconscious Burns	<p>Ensure substances are approved entry to site by ADCO e.g. fuels and solvents etc</p> <p>Ensure correct storage has been established as per SDS for all substances</p> <p>Ensure Spill Kits are available</p> <p>Ensure local drains etc are protected when substances are used</p> <p>Assess the situation</p> <p>Notify emergency services (if required)</p> <p>Await further instructions</p>	Project Nurse Call System Trained First Aid Personnel (ADCO) First Aid Provisions e.g. Kits/Room Defibrillator
<p>Severe Weather Event e.g. storms, high winds, rain and lighting etc</p>	Potential Injuries to workers Potential damage to structures	<p>Monitor weather through daily checks on the BOM</p> <p>Advise workers of pending weather events.</p> <p>Secure materials.</p> <p>Cease crane operations.</p> <p>Cease scaffold use.</p> <p>Assess the situation</p> <p>Assemble at Muster Point or other agreed location based on weather conditions</p> <p>Notify emergency services (if required)</p> <p>Await further instructions</p>	HammerTech Alerts

Works	HR Workshop Date	PCBU Representation	Attendees (ADCO/Client.Contractors)	HammerTech Meeting Completed	HammerTech Meeting Link	HR Workshop Risk Assessment	PRR Updated	Comments
Piling Works	31/01/2022	APG/ADCO	APG/PB, RE, DG, RT, MZ, GA, SB	31/01/2022	https://adco.hammertechonline.com/nsw-3547-kingswood-tafe-iatc/MeetingSignin/Index?generatedTime=2022-05-02%2000%3A05%3A02&meetingId=05876d52-4282-ec11-844f-b07b25c00deb&signature=Om5Xrc2s7INJGdF0XAk88zbqBlf6uBmjShduHp5EJ7U%3D	https://www.dropbox.com/s/bquveh7ktpf2kew/High%20Risk%20Activity%20Workshop%20Template%20-%20TAFE%20Kingswood%20Piling.xlsx?dl=0	N/A	
•Civil excavations/shoring wall drop- circa		Jeffsann/ADCO						
•Formwork- incl high strutting and handrail systems- circa (Temporary Support Systems)	20/02/2022	Transform/ADCO	MA/KM/DK/GA/PM/PB/RT/RE/SB/PB	4/04/2022	https://adco.hammertechonline.com/nsw-3547-kingswood-tafe-iatc/MeetingSignin/Index?generatedTime=2022-05-01%2023%3A55%3A45&meetingId=5fe7b8f2-0eb2-ec11-844f-b07b25c00deb&signature=OCLCOdGFV%2B7EYLvjHTTKVpDmQaN26g7vDzfKi68eS14%3D	waiting confirmation of fall prevention risk controls - Draft contained:https://www.dropbox.com/s/0npiw58c5jcuOd/High%20Risk%20Activity%20Workshop%20Formwork.xlsx?dl=0	Yes	to finalise HR Workshop RA and PRR the following is required: Transform SWMS to be updated ASAP after Fall Prevention systems/Loading requirements and accesses are finalised Access including loading/unloading requirements to formwork decks to be confirmed in parallel with fall protection systems proposal by Transform. (to include shutter dimensions, weights etc
•Scaffold- circa	15/07/2022	ADCO/Crown Scaffolding	SB/CK	18/07/2022	https://adco.hammertechonline.com/nsw-3547-kingswood-tafe-iatc/Private/Meetings/Details/2a4da0c1-5006-ed11-8450-b07b25c00deb	TBC	Yes	
•Shared Service Trench through Campus- April	1/04/2022	Foran/ADCO	SB/DG/MF/PW	12/04/2022	https://adco.hammertechonline.com/nsw-3547-kingswood-tafe-iatc/MeetingSignin/Index?generatedTime=2022-05-01%2023%3A49%3A37&meetingId=a3eaf126-4bb9-ec11-844f-b07b25c00deb&signature=tsXmzrvzcdgMatizvk4hVh3zswzHF9VxaUJoGZZYUpk%3D	TBC	N/A	
•Substation Works- April	11/05/2022	PDA/ADCO/Client	ER/TR/SB/RE/RT	18/05/2022	https://adco.hammertechonline.com/nsw-3547-kingswood-tafe-iatc/MeetingSignin/Index?generatedTime=2022-05-23%2002%3A17%3A13&meetingId=07beee0d-71cb-ec11-844f-b07b25c00deb&signature=aBW6itt6oDTBnEcBTqctsi4ERRbdws3ELn3imGdF3bA%3D	https://www.dropbox.com/s/84gho99gy8zifz0/High%20Risk%20Activity%20Workshop%20Substation%20Template%20-%20TAFE%20Kingswood.xlsx?dl=0	No Controls already with Procedures	PDA to provide regulatory acceptance letter
•RMS Great Western Highway Works-TBC								
•Structural steel erection- End May- (Steel install starts in June)		Gonzalez/ADCO						
•Roofing- June/July								
•Mobile cranes- Ad hoc (progressively as needed- task dependant)								
Shotcrete	12/05/2022	APG/ADCO	WA/SB/RE/RT	17/05/2022	https://adco.hammertechonline.com/nsw-3547-kingswood-tafe-iatc/MeetingSignin/Index?generatedTime=2022-05-23%2002%3A26%3A10&meetingId=2f5dc197-44cf-ec11-844f-b07b25c00deb&signature=cBc340QwmclyvTG9S6DSKyLui56bonRy7k3fhziU%2BQU%3D	https://www.dropbox.com/s/bhhar4r18pux5om/High%20Risk%20Activity%20Workshop%20Shotcrete%20Template%20-%20TAFE%20Kingswood.xlsx?dl=0	NO Controls already with Procedures	

APPENDIX 2- UNEXPECTED FINDS- CONTAMINATION AND HERITAGE FINDS PROTOCOL- SUB PLAN

PEOPLE WHO BUILD

UNEXPECTED AND HERITAGE FINDS PROTOCOL

PROJECT

**TAFE NSW INSTITUTE OF APPLIED
TECHNOLOGY FOR CONSTRUCTION**

PROJECT NO

3547

REVISION NO

004

UNEXPECTED AND HERITAGE FINDS PROTOCOL



VERSION CONTROL

Rev. No.	Issue Date	Approved By	Position	Details
001	01/12/21	P.Brennan	Project Manager	Updated for CEMP
002	18/02/22	P.Brennan	Project Manager	Updated w change personnel
003	15/03/22	P.Brennan	Project Manager	Response processes Consulting Planning secretary amended
004	18/06/22	P.Brennan	Project Manager	General Update Review- Personnel Update

ADCO PROJECT PERSONNEL CONSULTATION AND SIGN OFF

We, the undersigned, confirm that we have been consulted on the contents of this document, read and understood the contents of this document, and agree to implement the requirements of this Plan on this project site.

Name	Position	Acknowledgment
Simon Brown	Site Manager	
George Baliotis	Site Foreman	
Rob Torchia	Site Foreman	
Kieran Hill	Project Engineer	
Matthew Olszewski	Project Engineer	
George Awad	Project Engineer	
Russell Eccles	HSE Advisor	
Andrew Roman	Services Manager	
Jed Nicholl	Senior Contract Administrator	
Rami Mehzer	Contract Administrator	
Nick Moldrich	Senior Design Manager	
Harrison Crouch	Cadet- CA	
Mark Zabica	Cadet- Engineer	
Tyler Barker	Construction Worker	
Nick Meagher	Construction Worker	

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Darrell Price	Construction Worker	
Max Evans	Apprentice	
Dean Israel	Construction Manager	
Pierce Brennan	Project Manager	

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INTRODUCTION

MANAGEMENT SYSTEM AND DOCUMENTATION

System documents which are referenced in this Plan or any associated Plan or Risk Register can be sourced by accessing the ADCO Constructions Intranet. (ADCO personnel only). Additional information can be obtained from the HSE Manager in each State.

ADCO PERSONNEL SIGN OFF

ADCO project personnel will be inducted into the requirements of this Plan and any associated Plan or Risk Register by the relevant Project Manager. Evidence of induction and discussion will be recorded within section ADCO Project Personnel Consultation and Sign off.

INFORMATION SUPPLY TO SUBCONTRACTORS

This Plan and any associated Plan or Risk Register (including any future revisions) will be supplied to subcontractors for review through the Aconex portal or another approved format.

PLAN REVIEW

This document will be reviewed on a periodic basis, not exceeding 6-monthly, to ensure its compliance to legislative and operational requirements of the. Project. Review and updates to this plan will initiate a change to the plan revision number and be recorded in the "Version Control" section of the document. Superseded Plans will be marked as such and will be located within the Management Plan Folder located in the Site Office.

SITE FILING

A hard copy of this Plan and any associated Plan or Risk Register (including any future revisions) will be held on site

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PRINCIPAL CONTRACTORS DETAILS

Name	State Address	ABN
ADCO Constructions Pty Ltd	Address	Level 2, 7-9 West Street
	Suburb	North Sydney
	State	NSW
	Phone	02 8437 5000

PROJECT INFORMATION

Project Description	The TAFE NSW IATC will comprise a 3 level construction (lower ground, Upper ground & level 1) with internal workshops, café, learning areas, amenities, storage in the lower ground, Amenities, industry engagement and staff kitchen in the upper ground and level 1.
	The development includes an additional carpark and provides services for a projected 3500 student enrolment, encompassing various construction disciplines.
	The project is on an existing field of the NSW TAFE Nepean campus, adjacent to the WSU Werrington South Campus.
Project Address	12-44 O'Connell St, Kingswood 2747
Project Duration	October 2021- April 2023
Building Certifying Authority	Philip Chun and Associates

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SITE REQUIREMENTS

SITE ACCESS

Main Site Vehicle Entry Location	King Street Gate 1 (Construction Materials Access)
Visitor Entry Locations	O'Connell Street via TAFE NSW Campus
Secondary Vehicle Entry Point	King Street Gate 2 (Construction Materials Access)
Site Carpark Entry Point	O'Connell Street via TAFE NSW Campus

WORK HOURS

Working Hours	7am – 6pm Monday to Friday inclusive
	8am – 4pm Saturdays
	No work may be carried out on Sundays or Public Holidays

CONTACTS

24-hour Project Contacts	Project Manager – Pierce Brennan 0419 422 566
	Site Manager – Simon Brown 0419 012 704

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OVERVIEW

ADCO Constructions (ADCO) implements an integrated safety and environmental management system on all projects, which are known as The ADCO Way. Our HSE (Health, Safety and Environment) Management System, documents the manner in which construction-related activities are required to be completed on ADCO project sites. This Management Plan provides guidance to site personnel in the event that an unexpected find is encountered on site.

An unexpected find can be defined as:

- / Any unanticipated archaeological discovery;
- / Buried or surface asbestos containing materials;
- / Buried waste materials;
- / Septic or Underground Storage Tanks;
- / Animal burial pits;
- / Discoloured and odorous soils and groundwater/seepage.

GENERAL PRINCIPALS FOR ASBESTOS CONTAINING MATERIALS (ACM)

ADCO's principles of asbestos management have been adapted from general principles published in the Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)]. These principles are summarised below:

- / Consideration should be given to the removal of ACM during any renovations, refurbishments or maintenance work in preference to other control measures such as encapsulation, enclosure and sealing.
- / The WHS Regulation requires all ACM within the construction area to be labelled.
- / Where ACM is identified or presumed, the locations and type of ACM are to be recorded in the ACM Register located within the Asbestos management plan folder.
- / A risk assessment must be performed on all identified or presumed ACM.
- / Control measures must be established to prevent exposure to airborne asbestos fibres and should take into account the results of risk assessments conducted for the identified or presumed ACM.
- / All workers and contractors on site must be advised of the ACM Register at time of induction, and as requested, permitted access to the register for their review
- / Only competent persons should undertake the identification of ACM.
- / All workers and contractors on site where ACM are present or presumed to be present, and all other persons who may be exposed to ACM as a result of being on the premises, must be provided with full information on the occupational health and safety consequences of exposure to asbestos and appropriate control measures. The provision of this information should be recorded.
- / Reasonable steps must be taken to identify all possible locations of ACM within the site.

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- / Once a risk assessment has been completed and controls established, a SWMS is to be developed and submitted to ADCO's site management team for approval

UNEXPECTED HERITAGE FINDS (UHF)

An Unexpected Heritage Find can be defined as any unanticipated archaeological discovery that has not been identified during a previous assessment or is not covered by an existing permit under relevant legislation such as the NPW Act or Heritage Act. The find may have potential cultural heritage value, which may require some type of statutory cultural heritage permit or notification if any interference of the heritage item is proposed or anticipated.

The range of potential archaeological discoveries can include but are not limited to:

- / Aboriginal or European stone artefacts, shell middens, burial sites, engraved rock art, scarred trees;
- / Remains of rail infrastructure including buildings, footings, stations, signal boxes, rail lines, bridges and culverts;
- / Remains of other infrastructure including sandstone or brick buildings, wells, cisterns, drainage services, conduits, old kerbing and pavement, former road surfaces, timber and stone culverts, bridge footings and retaining walls;
- / Artefact scatters including clustering of broken and complete bottles, glass, ceramics, animal bones and clay pipes;
- / Archaeological human skeletal remains.

TRAINING

Asbestos and Heritage Awareness Training

Asbestos awareness training provides participants with a general overview of asbestos including history and background; asbestos types and properties; common asbestos situations; health effects; risk in perspective and management of asbestos, conducted by an ADCO person.

Asbestos and Heritage Removal Training

This course is typically provided by an external registered training organisation (RTO) to personnel who intend to remove bonded ACM, pre-requisite for obtaining a WorkCover recognised licence

Further information on training required for staff can be found in ADCO's [National Training Matrix](#).

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PROCEDURE IN THE EVENT OF AN UNEXPECTED FIND

Should an unexpected find of potential contamination be encountered during the works, the following procedure (Steps 1 to 13) should be followed with reference to the Incident Response Flow Chart.

Works on site are to be carried out in accordance with the recommendations of the document titled 'Aboriginal Cultural Heritage Assessment (Revision F01)' prepared by Urbis and dated 2 June 2021.

It must additionally be ensured that implemented procedures are in accordance with other adopted site documentation, such as the Environmental Management Plan, Health and Safety Management Plan and The ADCO Way and SSD Consent Condition C25 and C26.

1. Stop work in the potentially contaminated/ culturally significant area as soon as it is safe to do so and move to a designated meeting point or safe area. Excavation will cease in the vicinity of the discovery. Site Manager to delineate an exclusion quarantine zone around the area using fencing and or appropriate barriers and signage.
2. ADCO Project Manager to notify TAFE NSW Project Director, preferably via an initial phone call as soon as practicable, followed by a preliminary report with known details. Provide regular updates as necessary and submit final report on completion / close out.
3. A suitable person must assess the potential risk to human health and the environment posed by the unexpected find and assess if evacuation or emergency services need to be contacted. A suitably experienced environmental consultant should undertake an assessment of any unexpected finds and determine any further actions required e.g. sampling and/or validation of material, potential for remediation and/or management. Assessment activities include;
 - / Preliminary assessment of the find and need for immediate management controls (if any).
 - / What further assessment and/or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and guidelines.
 - / Confirm any necessary testing to verify suspected contamination.
 - / Preparation of a remedial action plan for large scale contamination or specification for smaller or minor volumes of material (if necessary).
 - / Remediation works required (where applicable).
 - / Validation works required following remediation works (if applicable).
4. In the event where the find is believed to be Archaeological or Aboriginal a suitably qualified Archaeologist or Aboriginal Representative from the Dharug Clan must be consulted and invited to attend site to inspect.

If find is believed to be or Archaeological or Historic Heritage notice is to be given to Heritage NSW and the Planning Secretary. If believed to be of Aboriginal significance the site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by Heritage NSW under Department of Premier and Cabinet and the management outcome for the site included in the information provided to AHIMS;
5. ADCO Constructions will consult with the Aboriginal community representatives, the archaeologists and Heritage NSW to develop and implement management strategies for all objects/sites
6. Works shall only recommence with the written approval of the Planning Secretary.
7. Works are not to recommence in the affected area until appropriate advice/testing has been obtained from the environmental consultant or suitably qualified person and they have provided clearance.

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Excavation will not recommence until the extent of the contamination has been assessed and, if necessary, a remedial action plan (RAP) has been prepared.

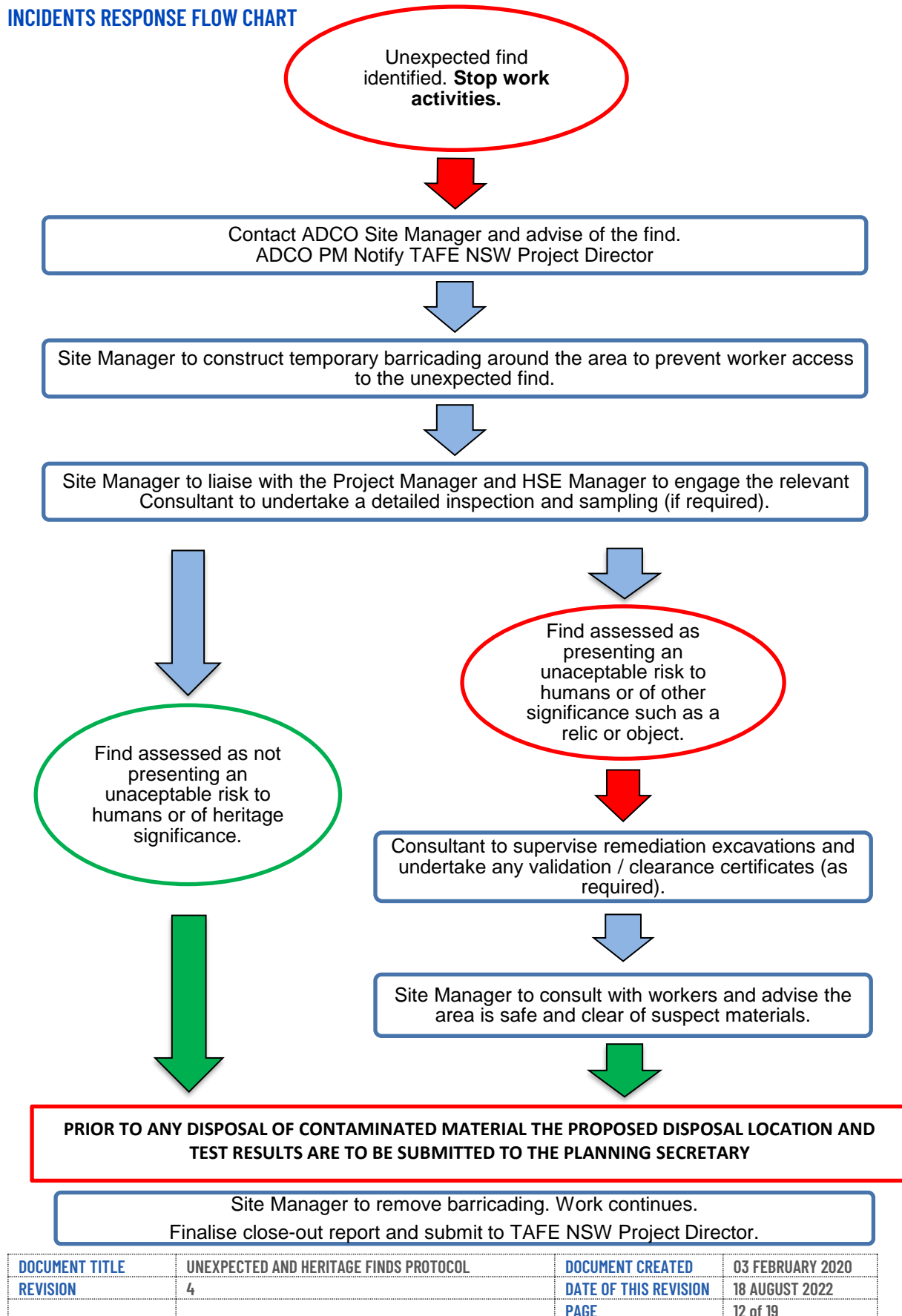
8. In addition to point 6 and in accordance with SSD Condition C25, C26; the off-site disposal of any material is not to commence until the following information has been submitted to the Planning Secretary.
 - a. Proposed location (tipping facility) for the disposal of the contaminated material
 - b. Test results of contaminated material proposed to be disposed of
9. Air monitoring requirements are to be advised by an Environmental Consultant.
10. If it is deemed safe to do so, the environmental consultant will provide clearance for works to proceed in the affected area. If it is not considered to be safe, works must remain on hold until appropriate assessment, remediation and / or validation measures have been actioned.
11. Excavated material from remedial activities will be separated from other materials and stockpiled for assessment. Sampling of the materials will be undertaken in accordance with the relevant guidelines or professional judgement where justification is applied. Samples will be analysed for a range of analytes as required for beneficial reuse or offsite disposal
12. For materials requiring offsite disposal, laboratory results will be assessed to determine the appropriate waste classification of the material in accordance with the NSW EPA Waste Classification Guidelines (2014). Depending on the classification, materials will be transported to an appropriate waste facility that is licensed to accept waste of the relevant classification or beneficially reused if appropriate
13. A waste tracking system recording the volume of material, waste classification / beneficial reuse status, removal documentation and truck and receiving landfill facility details must be recorded to ensure all waste is accounted for and disposed or appropriately in accordance with NSW EPA requirements.
14. Any unexpected finds must be documented, and records of volumes and types of materials identified removed from the site must be kept on file.
15. Keep a record of the unexpected find. The record must include exact location of the find. Documentation on the removal of any contaminated materials from the site must be kept on file
 - a. Volume of material removed,
 - b. The type (classification) of material,
 - c. Licensed facility that the material was disposed to,
 - d. Receipt documentation from the licensed facility confirming volume received.

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INCIDENTS RESPONSE FLOW CHART



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LEGAL AND OTHER REQUIREMENTS

COMPLIANCE

Risks, hazards and controls on this project will be implemented in accordance with legislation, Codes of Practice and Standards applicable in this State. Legislation, Codes of Practice and Standards which will be applied to this project are noted in the Environmental Risk Register.

IDENTIFICATION

The identification and assessment of environmental risks (aspects and impacts) that could eventuate during construction of the project will be completed by ADCO at any / all of the following project stages:

- / Design
- / Tender
- / Project planning
- / Project construction

Aspects and impacts will be assessed relative to:

- / The potential to cause the discharge or release of pollutants to water, air, or land.
- / The impact on flora, fauna or heritage.
- / The potential to impact on the surrounding neighbourhood (e.g. noise, vibration).

The identification, assessment and risk mitigation of environmental risks is documented in the Risk Register (Environmental).

MONITORING

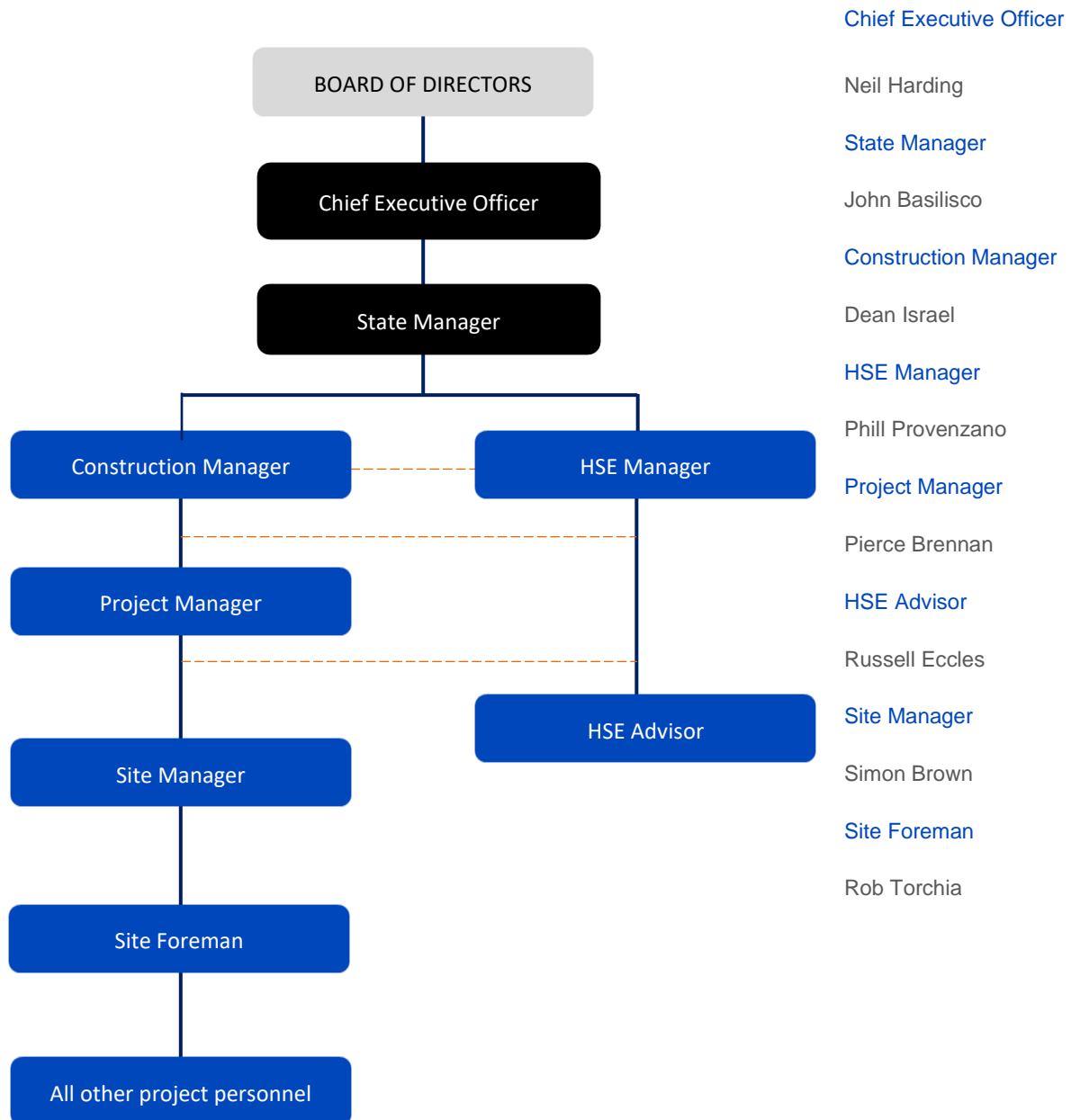
Actions taken to mitigate environmental risks must be reviewed for ongoing compliance by the Project Manager, Site Manager and HSE Adviser. Verification of monitoring should be noted on the Weekly Site Inspection form

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PROJECT MANAGEMENT STRUCTURE



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ORGANISATIONAL RESPONSIBILITIES

The Project Manager, Site Manager and HSE Adviser are responsible for ensuring that all site personnel comply with environmental risk mitigation requirements.

Person / Party	Responsibility
Construction Manager (CM), Project Manager (PM)	<ul style="list-style-type: none">/ Ensure all staff and contractors are aware of and comply with the plan./ Project management/ Identification and bringing to the attention of appropriate staff, any suspect material/ Ensure all contractors working on asbestos are aware of and meet the requirement of the plan./ Communication with SINSW and DPIE
Site Manager (SM), Health Safety and Environmental Coordinator (HSE)	<ul style="list-style-type: none">/ Obtain from Subcontractor, copy of WorkCover Notification (Requirement of ADCO Asbestos removal permit)/ Ensure project personnel (including contractors) are inducted/ Surveying, identification and arranging for sampling of suspected asbestos containing materials by competent persons./ Training and awareness/ Manage the asbestos works program and removal program/ Respond to incidents/ Document preparation, recording and filing/ Manage asbestos inspection contractor
Contractors (C) and Trades Staff (TS)	<ul style="list-style-type: none">/ Not to impact on an ACM without complying with the plan/ To bring to the attention of the SM/HSE any suspect material/ Refer to the plan for guidance to identify, manage, and remove asbestos/ Apply for Asbestos Permit to Work when performing asbestos removal work that requires notification./ Undergo ADCO Contractor Induction/ Develop a site specific asbestos removal control plan, SWMS AND Risk Assessment prior to performing the asbestos removal work

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ENVIRONMENTAL RISK REGISTER

Refer to Workplace Safety Australia to assist in the identification of Legislation and Codes of Practice that apply to ADCO operations and project / site activities undertaken. Applicable Legislation and Codes of Practice are to be identified in the reference section below.

Refer to Workplace Safety Australia for a detailed register of applicable Australian Standards. Access to Australian Standards is available through SAI Global

REFERENCE LEGISLATION

Acts and Regulations –

- / Environment Protection and Biodiversity Conservation Act 1999
- / Environmental Protection and Biodiversity Conservation Regulations 2000
- / Environmental Protection Act 1994
- / Environmental Protection Regulation 2008
- / Contaminated Land Act 1991
- / Protection of the Environmental Operations (POEO) Act 1997
- / Protection of the Environmental Operations (Clean Air) Regulation 2002
- / Protection of the Environmental Operations (Waste) Regulation 2005
- / Protection of the Environmental Operations (General) Regulation 2009
- / Contaminated Land Management Act 1997
- / Waste Avoidance and Resource Recovery Act 2001
- / Contaminated Land Management Regulation 2008
- / Environmental Protection Act 1997
- / Environmental Protection Regulation 2005
- / Environmental Protection Act 1970
- / Environmental Protection Act 1993
- / Environmental Protection Regulation 2009
- / Environmental Protection Act 1986
- / Environmental Protection Regulation 1987
- / Environmental Protection (Noise) Regulations 1997
- / Contaminated Sites Act 2003
- / Contaminated Sites Regulations 2006

Policy -

- / Environmental Protection (Waste Management) Regulation 2000
- / Environmental Protection (Air) Policy 2008
- / Environmental Protection (Waste Management) Policy 2000
- / Plant Protection Regulation 2002
- / Environmental Protection (Noise) Policy 2008
- / Nature Conservation Act 1992
- / Environmental Protection (Water) Policy 2009
- / General Environmental Protection Policy 2007
- / Contaminated Sites 2009
- / Noise 2010
- / Hazardous Material 2010

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- / Air 1999
- / Water Quality 2008
- / State Environment Protection Policy (Ambient Air Quality) 1999
- / State Environment Protection Policy (Groundwater's of Victoria) 1997
- / Industrial Waste Management Policy (Waste Acid Sulphate Soils) 1999
- / State Environment Protection Policy (Air Quality Management) 2001.
- / State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) 1989
- / State Environment Protection Policy (Prevention and Management of Contamination of Land) 2002
- / State Environment Protection Policy (Waters of Victoria) 1988
- / Code of Practice for the Building and Construction Industry – Stormwater Pollution Prevention 1999

Cultural Heritage -

- / The Native Title Act 1993 (Cth)
- / Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth)
- / Aboriginal Cultural Heritage Act 2003
- / Torres Strait Islander Cultural Heritage Act 2003
- / Queensland Heritage Act 1992
- / National Parks and Wildlife Amendment (Aboriginal Ownership) Act 1996
- / Heritage Act 1977
- / Aboriginal Land Rights Act 1983
- / Heritage Objects Act 1991
- / Heritage Act 2004
- / Aboriginal Heritage Act 2006
- / Aboriginal Heritage Regulations 2007
- / Aboriginal Heritage Act 1988
- / Heritage Act 1994
- / Heritage Places Act 1993
- / Aboriginal Heritage Act 1972

HSE System References

Procedure

- / Environmental Management

General Requirements

- / Erosion and Sediment Management
- / Air Quality Management
- / Water Quality Management
- / Noise and Vibration Management
- / Contaminants
- / Heritage Management
- / Waste Management
- / Spills Management
- / Fauna and Flora Protection
- / Potable Water Management
- / Non-potable Water Management

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ANNEXURE A – ADCO HERITAGE GENERAL REQUIREMENTS

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CULTURAL HERITAGE

DESCRIPTION

Cultural heritage is our window to the past.

Heritage includes tangible culture (e.g. buildings, monuments, landscapes, books, works of art, and artefacts), intangible culture (e.g. folklore, traditions, language, and knowledge), and natural heritage (e.g. culturally significant landscapes).

Our heritage is inherited from past generations, maintained by present generations and for the benefit of future generations.

Aboriginal cultural heritage includes physical and spiritual sites, places, objects, stories, oral histories, flora, fauna and documents relating to Aboriginal occupation before and after European contact.

Aboriginal cultural heritage consists of physical (tangible) or non-physical (intangible) elements and includes items made and used in traditional societies (e.g. stone tools, art sites and ceremonial or burial grounds) as well as historical elements (e.g. old mission buildings, massacre sites).

LEGISLATION

In addition to Federal legislation, all State and Territory governments have broad responsibilities for recognising and protecting Australia's heritage. Heritage laws protect, preserve, present, and transmit the Australian's natural, cultural, and historical heritage.

HERITAGE INFORMATION

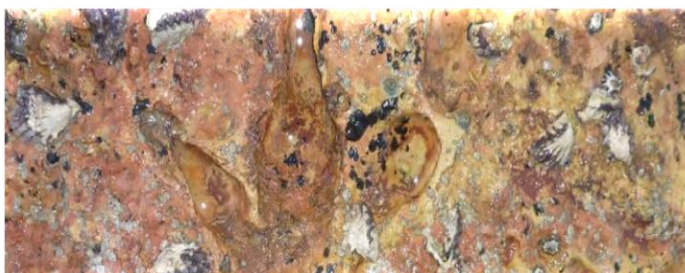
Heritage places are identified and grouped (by type) into so that they can be provided with protection and management to ensure the continuing of heritage values. Heritage places are grouped as follows:

World Heritage sites

World Heritage sites are places that are important to and belong to everyone, irrespective of where they are located. They have universal value that transcends the value they hold for a particular nation and are identified according to the World Heritage Convention.

The World Heritage Convention aims to promote cooperation among nations to protect heritage from around the world that is of such outstanding universal value that its conservation is important for current and future generations.

www.environment.gov.au/heritage/places/world-heritage-list



Dinosaur track, NT

Heritage is **all the things that make up Australia's identity** - our spirit and ingenuity, our historic buildings, and our unique, living landscapes. Our heritage is a **legacy from our past**, a living, integral **part of life today**, and the stories and places we **pass on to future generations**.

National Heritage

The National Heritage List is Australia's list of natural, historic and Indigenous places of outstanding significance to the nation.

www.environment.gov.au/heritage/places/national-heritage-list



Flinders Street Station, VIC



Shearers Shack, SA

Indigenous heritage

Aboriginal and Torres Strait Islander heritage is an important part of Australian heritage as evidence of the occupation of Australia by Aboriginal and Torres Strait Islander people dates back more than 60,000 years.

As well as historically important, Indigenous heritage is of continuing significance, creating and maintaining continuous links with the people and the land. Places that hold great meaning and significance to Indigenous people include:

- ▽ places associated with Dreaming stories depicting the laws of the land and how people should behave
- ▽ places that are associated with their spirituality
- ▽ places where other cultures came into contact with Indigenous people
- ▽ places that are significant for more contemporary uses.

www.environment.gov.au/heritage/about/indigenous-heritage



Commonwealth heritage

Commonwealth Heritage comprises natural, Indigenous and historic heritage places on Commonwealth lands and waters or under Australian Government control.

The Commonwealth Heritage List is a list of natural, Indigenous and historic heritage places owned or controlled by the Australian Government.

www.environment.gov.au/heritage/places/commonwealth-heritage-list



Warwick Post Office, QLD



Jervis Bay Botanical Gardens, NSW

SITE MANAGEMENT

Construction activities most likely to cause impacts to heritage buildings or areas include, but are not limited to:

- ▽ Flora clearing activities.
- ▽ Trenching and excavation work activities (e.g. vibration).
- ▽ Dust emissions from general work activities.
- ▽ Damage by plant / equipment / substance operation or storage on or near heritage sites.

Potential or actual heritage issues are normally identified during the planning / development approval period of a project and the required controls are generally noted in the Development Approval (DA).

Where heritage management requirements are noted in a DA, the information and controls must be:

- ▽ Incorporated into the Project Plan and the Environmental Risk Register.
- ▽ (as required) Detailed in a stand-alone Management Plan (e.g. Cultural Heritage Plan).
- ▽ Provided to relevant subcontractors for consideration in their pricing and their SWMS.
- ▽ Provided to workers through site consultative processes.
- ▽ Monitored for compliance during the completion of the project.

MANAGING UNEXPECTED FINDS

An '**unexpected heritage find**' is "any unanticipated archaeological discovery that has not been identified during a previous assessment or is not covered by an existing permit under relevant legislation".

The range of potential archaeological discoveries can include but are not limited to:

- ▽ Aboriginal stone artefacts, shell middens, burial sites, engraved rock art, scarred trees.
- ▽ Remains of infrastructure including buildings, footings, old kerbing and pavement, former road surfaces, timber and stone culverts, bridge footings and retaining walls.
- ▽ Artefact scatters including clustering of broken and complete bottles, glass, ceramics, animal bones and clay pipes.

When a "find" is identified in a work area:

1. All work in the find area must be stopped and the find must be reported to the Site Manager.
2. The Site Manager must establish a 'no-go zone' for at least 10 metres around the find. (e.g. fencing, hi viz mesh, solid barricades) where practical. No interference, including works, ground disturbance is allowed in the zone.
3. The Site Manager must notify the Project Manager.
4. The Project Manager to contact a heritage Adviser and arrange for the Adviser to assess the find.
5. Subject to assessment, work may recommence at a set distance from the item. Existing protective barriers may need to be adjusted.
6. To recommence work in the find area, the Project Manager must obtain written clearance from the Adviser including any additional project/heritage approvals/determinations.
7. Where required, the Project Manager / State SHE Manager will be required to update the Project Risk Register (environmental) to reflect the find and any additional conditions / controls.
8. The Site Manager or S&E Adviser will be required to incorporate any changes to the PMP into: the site induction presentation; (as required) the Traffic Movement Plan and the Pre-Start Meeting.

UNEXPECTED AND HERITAGE FINDS PROTOCOL



ANNEXURE B – ADCO ASBESTOS MANAGEMENT PROCEDURE

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PLANNING

PURPOSE

This procedure has been developed to provide guidance on **Asbestos Management**.

The procedure is not conclusive as alternative requirements may apply nationally. It is recommended that further guidance is obtained from your State Regulatory Authority or through www.safeworkaustralia.gov.au

DEFINITIONS

Asbestos	<p>Asbestos is a naturally-occurring mineral found in rock, sediment or soil. It has strong fibres that are heat resistant and have good insulating properties.</p> <p>You can't see asbestos fibres with the naked eye and because they are very light, they can be blown long distances by the wind.</p> <p>Because of its durable properties asbestos building products have been used for many years prior to it being classified as unsafe and a carcinogen product.</p>
Friable Asbestos	<p>Friable asbestos is a material containing asbestos that when dry, it may be crushed or pulverised into powder form using your hand or plant. This material poses a higher risk of exposing people to airborne asbestos fibres.</p>
Non Friable / Bonded Asbestos	<p>Non-friable or bonded asbestos products are solid in nature and you generally can't crumble them in your hand—the asbestos has been mixed with a bonding compound such as cement. If non-friable asbestos is damaged or degraded it may become friable and will then pose a higher risk of fibre release.</p>
Naturally Occurring Asbestos	<p>Occurs in some rocks and soils as a natural mineral. With few exceptions, (like road building and maintenance in naturally occurring asbestos areas), the risk of exposure associated with naturally occurring asbestos is very low.</p>

SAFETY ESSENTIALS

The project team are required to review the [ADCO Safety Essentials](#) to ensure that all mandatory risk management requirements are understood and completed prior to commencement of works, during the works and upon completion of the works.

Refer to [ADCO – Safety Essentials](#)

PROJECT RISK REGISTER AND MANAGEMENT PLANS

The Project Risk Registers/Management Plans developed by the **Project Manager** at the start of the project, provides project-specific information pertaining to identified high risk works, risks and control measures.

- / The Risk Registers/Management Plans must be reviewed by the site team to familiarise themselves with identified high risk works to be undertaken.
- / For the life of the project, the Risk Registers/management Plans should be reviewed on a regular basis and kept up to date with changes to scope and identified high risk works.
- / Copies of the Risk Register and Safety Management Plan must be made available to all workers and interested parties.

Refer to [Procedure: Performance Management](#)

PROCEDURE ASBESTOS MANAGEMENT



SITE PLANNING

Prior to commencing any work, the project team and relevant subcontractor must discuss and agree on the following, but not limited to:

- / Hazardous Material Report / Asbestos Register
- / Provision of an Asbestos Management Plan
- / Assessor/Hygienist
- / Sequence of work
- / Method of removal, encapsulation or remediation
- / Monitoring of work
- / Impact on workers or public
- / Decontamination for personnel and plant
- / Disposal methods and approved tipping facility
- / Air monitoring
- / Inspections, clearance certificates
- / Consultation and communication
- / Legal and other requirements

Hazardous Materials Report

Prior to commencing any work such as Demolition, Asbestos Removal or any other construction work, a Hazardous Material Report which includes an Asbestos Register must be prepared for the intended project.

The Hazardous Material Report should include; but is not limited to the following:

- / Any hazardous materials in the workplace (e.g. lead, asbestos, SMF, PCB's)
- / Details of any asbestos known to be in the workplace (e.g. location, type, condition)
- / Results of any analysis that confirms a suspect material at the workplace.
- / Details of inaccessible areas.
- / Photographs or drawings to visually show the location of the asbestos in the workplace.

Verification of competency of the person completing the report.

- / The Report must be obtained by the **Project Manager / Site Manager** for review prior to commencing any work.
- / The report must be completed by a competent person (Licensed Asbestos Assessor)
- / Any testing and sampling must be in accordance with NATA specifications.

A copy of the Report must be kept on site and made available to interested parties

Asbestos Register

A person with management or control of a workplace must ensure an **Asbestos Register** is prepared and kept at the workplace. The register must be maintained to ensure the information in the register is up to date.

Note: A register is not required to be prepared when:

- / The workplace is a building that was constructed after 31 December 2003, and
- / No asbestos has been identified at the workplace, and
- / No asbestos is likely to be present at the workplace from time to time.

However, if asbestos is identified, a person with management or control of a workplace must ensure a register is prepared for the workplace.

A person with management or control of a workplace must ensure an asbestos register is reviewed where necessary if:

- / The asbestos management plan is reviewed
- / Further asbestos or ACM is identified at the workplace
- / Asbestos is removed from or disturbed, sealed or enclosed at the workplace, or refurbishment or demolition work is to be undertaken.

PROCEDURE ASBESTOS MANAGEMENT



The register should be reviewed at least once every five years to ensure it is kept up to date.

Asbestos Management Plan

A person who has management or control of the workplace must ensure that an **Asbestos Management Plan (AMP)** is prepared if asbestos has been identified.

The asbestos management plan must:

- / Identify the location of asbestos and any naturally occurring asbestos.
- / Include decisions—and reasons for them—about the management of asbestos at the workplace, for example safe work procedures and control measures.
- / Outline procedures for incidents and emergencies involving asbestos.
- / Be maintained with up-to-date information.
- / Be reviewed at least every five years or when requested by a health and safety representative, or when asbestos is removed, disturbed, sealed or enclosed, or when changes to a control measure are made or when the plan is no longer adequate.
- / Be accessible to any worker or who has carried out or intends to carry out work at the workplace and any health and safety representatives who represent workers at the workplace.
- / Provide information, consultation and training responsibilities to workers carrying out work involving asbestos.

Other information that could be included in the asbestos management plan includes:

- / An outline of how asbestos risks will be controlled, including consideration of appropriate control measures.
- / Identify those with responsibilities and their responsibility under the asbestos management plan.
- / Air monitoring procedures at the workplace, if required.
- / Disposal requirements.
- / Appointment of the Asbestos Assessor.

Plan must be obtained by the **Project Manager / Site Manager** for review prior to commencing any work.

General notes:

- / Where the activity involves removal of more than 10m² of (ANY TYPE) of Asbestos, a AMP inclusive of a SWMS is required for the works.
- / The AMP must be prepared by a licenced asbestos removalist.
- / Where the activity involves removal of less than 10m² of non-friable Asbestos, an AMP is not required. However, a detailed SWMS is required.

A copy of the AMP must be kept on site and made available to interested parties.

REGULATORY PERMITS AND NOTIFICATIONS

The **Project Manager** must ensure relevant permits have been acquired and are current for the intended works.

- / Check with your State Regulatory Authority for notification and permit requirements.
- / Contact: www.safeworkaustralia.gov.au or the relevant State Regulatory Authority.
- / Evidence of notification or permits must be kept on site and made available to interested parties.

PROCEDURE ASBESTOS MANAGEMENT



CONTRACTOR COMPETENCY

Licensed Asbestos Assessor

A licenced Asbestos Assessor must be appointed for the asbestos works.

The purpose of the Assessor is to:

- / Manage air monitoring requirements
- / Identify potential asbestos and ACM
- / Assess the risk of exposure to airborne asbestos
- / Suggest measures to minimize or eliminate the risk of exposure
- / Prepare an Asbestos Management Plan, or review existing plan if required
- / Prepare an Asbestos Register for your site, or review your current register
- / Be present and monitor air quality and procedures during asbestos work
- / Conduct clearance inspections
- / Provide clearance certificates

A copy of the Assessors licence must be verified, kept on site and made available to interested parties.

Contractor Licence

Prior to commencing any work, the subcontractor must provide written proof that they are currently licenced with the **State Regulatory Authority**.

- / Note: check with your State Regulatory Authority for licence requirements.
- / Contact: www.safeworkaustralia.gov.au or the relevant State Regulatory Authority.

A copy of the Contractor licence must be verified, kept on site and made available to interested parties.

Note: Ensure the nominated supervising person is noted on the contractor's licence

Worker Competency

Prior to commencing any work, the subcontractor must provide evidence of competency for his supervisor's managing the works.

- / CPCCBC4051A – Supervise Asbestos Removal

Prior to the start of work, the contractor must provide evidence of competency for his workers.

- / CPCCDE3015A – Removal friable asbestos (Class A)
- / CPCCDE3014A – Removal of non-friable asbestos (Class B)

A copy of all competencies must be verified, kept on site and made available to interested parties.

REVIEW AND APPROVAL

Prior to any works, all associated documentation relevant to the high-risk work must be reviewed, approved and regularly revised by the **Project Manager / Site Manager**.

Any concerns or issues must be raised immediately with the subcontractor and addressed. Where concerns or issues cannot be resolved, these must be elevated to the **Construction Manager**.

PROCEDURE ASBESTOS MANAGEMENT



CHECKLIST COMMENCEMENT

Prior to commencing any work, the **PLANNING** section of the activity checklist must be completed and authorised by the **Project Manager**. If the **Project Manager** is unavailable to approve the **PLANNING** section of the checklist, the **Construction Manager** must complete and approve in their absence.

Activity Checklist – Asbestos Management
Refer to *Procedure: Permit Management*

SITE ACTIVITY MANAGEMENT

WORK AREA INSPECTION

Prior to commencing any work, the **Site Manager** together with the subcontractor supervisor must complete an inspection of the work area. The purpose of the inspection is to:

- / Review the work area.
- / Agree on the work activity, work schedule, risks and control measures.
- / Review emergency procedures
- / Obtain information required to complete the relevant Checklists and ATW Permit

CHECKLIST COMPLETION

Prior to commencing any work, the **SITE ACTIVITY MANAGEMENT** section of the activity checklist must be completed and authorised by the **Site Manager** prior to issuing an Authority to Work Permit. If the **Site Manager** is unavailable to approve the **SITE ACTIVITY MANAGEMENT** section of the checklist, the **Project Manager** or **Construction Manager** must complete and approve in their absence.

Activity Checklist – Asbestos Management
Refer to *Procedure: Permit Management*

AUTHORITY TO WORK PERMIT

Prior to commencing the work activity, an **Authority to Work Permit** must be issued by the **Site Manager** for the intended works.
Refer to *Procedure: Permit Management*

CONSULTATION

Information relating to the work and control measures must be provided to subcontract workers at site induction and through any other forms of consultation utilised on the project.
Refer to *Procedure: Consultation and Communication*

MONITORING REQUIREMENTS

MONITORING

The **Site Manager** must ensure that controls measures have been established and maintained for the duration of the works.

Monitoring should include:

- / Compliance to SWMS methodology and controls
- / Compliance to Permit condition
- / Compliance to the Asbestos Management Plan
- / Compliance to any additional agreed control measures
- / Compliance to work activity PPE etc.

Observations should be recorded in the *Weekly Site Inspection* or other inspection formats.

Non – Compliance issues must be addressed in accordance with system requirements.

Refer to *Procedure: Subcontractor Management*

Refer to *Procedure: Performance Management*

Air Monitoring

Air monitoring involves the sampling of airborne fibres to assess exposure and the effectiveness of control measures.

- / Friable Asbestos – Mandatory requirement
- / Non-friable Asbestos –Recommended

Air Monitoring:

- / Must be completed before, during and after the work by a competent person (Asbestos Assessor)
- / Results should be posted on site and discussed with relevant / interested parties e.g. workers, HSE Committees etc
- / Results are to be filed and archived for 30 years.

Waste Management

Material containing asbestos:

- / Must not accumulate in work areas and should be collected and bagged/binned by the end of each shift.
- / Must be sealed in double-lined, heavy-duty plastic sheeting ((200 µm minimum thickness) or double bagged before placement in a designated and excised waste skip.
- / Must be labelled ASBESTOS

Waste skips used for the storage and disposal of asbestos waste must:

- / Be placed in the asbestos removal work area or separately fenced.
- / Be lined with plastic (min 200 µm thickness).
- / Carry labels on the exterior warning of the ASBESTOS.

Waste Transport

Some states require operators of vehicles transporting hazardous waste to be licensed;

- / **QLD/VIC:** Contaminated waste > 250kg in any load requires that the transport vehicle be licensed by a regulatory authority (i.e. EPA).
- / **NSW:** Any load of >10m² of asbestos sheeting or 100kg of asbestos waste must be notified on-line to the EPA by the waste transporter.
- / **WA:** No licence required

A copy of all licences must be kept on site

PROCEDURE ASBESTOS MANAGEMENT



Copies of all waste disposal / tipping dockets must be obtained by the **Project Manager** or **Site Manager** and filled.

Health Surveillance Working with asbestos has the potential for the following diseases if controls and precautions aren't established as detailed below.

The licenced subcontractor must arrange and pay for health checks by a medical practitioner for all workers or workers who may be exposed to asbestos during the removal process.

All health reports for asbestos must be kept for 40 years. Worker must receive a copy of their health report.

Contact: www.safeworkaustralia.gov.au or the relevant State Regulatory Authority for health surveillance requirements.

Asbestosis: Asbestosis is a chronic chest disease caused by inhalation of high concentrations of asbestos fibres. The condition can develop 10 to 20 years after initial exposure.

Lung Cancer: Lung cancer of the bronchial tubes, lungs and alveoli can develop after exposure to asbestos. Those who have been exposed to asbestos and who have smoked run a much greater risk of getting lung cancer.

Mesothelioma: Mesothelioma is a cancer of the lung lining. It can result from low-level exposure to asbestos and can take 30 to 45 years to develop after initial exposure.

Pleural Disease: Inflammation and irritation of outer lining of the lung, the pleura. The pleura stiffens and thickens and can fill with fluid. This thickening can restrict breathing.

Presence of Asbestos A person with management or control of a workplace must ensure the presence and location of:

- / all asbestos or ACM identified at the workplace is clearly indicated, and
- / all asbestos or ACM assumed to be at the workplace, including where the asbestos is inaccessible, is clearly indicated.

If reasonably practicable, the presence and location of the asbestos or ACM must be indicated by a label. However, it may be more appropriate to use signs.

Decontamination Units As directed by the Hazardous Material Report or risk assessment, a decontamination unit may be required for workers and equipment.

A decontamination unit is a transportable shower unit with a series of separate "cleaning" compartments which personnel proceed through to remove contaminants / pollutants they may have been exposed to during their work.

- / The unit must be installed prior to the start of works
- / Ensure it is fit for purpose
- / Is connected and functional

Decontamination units may vary from size and design pending supplier or subcontractor preference.

Encapsulation As directed by the Hazardous Material Report or risk assessment, the Asbestos affected areas may require partial or full encapsulation.

Asbestos encapsulation refers to the treatment of asbestos containing materials with sealants. These sealants then surround the asbestos fibres, thus preventing them from being released. The bridging encapsulant used in this method creates a membrane that penetrates the asbestos containing material and binds itself with the fibres.

PROCEDURE ASBESTOS MANAGEMENT



Asbestos encapsulation may also mean creating a plastic “bubble” wrap around a building or area where asbestos is to be removed

Sampling ACM

A person with management or control of a workplace may identify asbestos or ACM by arranging for a sample of material to be analysed.

A sample must only be analysed by:

- / NATA-accredited laboratory accredited for the relevant test method
- / Laboratory approved by the regulator, or
- / Laboratory operated by the regulator

Any sample taken should be sealed within a container, or double bagged using heavy duty plastic (200 µm thickness polyethylene), and appropriately labelled.

Once the results of the sampling are known, the person with management or control of the workplace must ensure the asbestos register is updated.

Personal Protective Equipment

Ensure all workers or other persons within the asbestos work zone are correctly protected and using prescribed PPE.

All protective equipment must meet Australian Standards.

PPE must be discarded as contaminated waste

Unexpected Finds

Any suspected ACM found during works which was not originally identified must be managed and controlled by:

- / Stopping all work in the immediate area
- / Establishing an exclusion zone around the affected area
- / Erecting asbestos warning signs
- / Covering the suspected material
- / Keeping the material damp or wet
- / Arranging for the material to be inspected and tested
- / Advising all workers of the potential danger and control measure

Once material has been confirmed as asbestos, the **Site Manager** must ensure correct removal and disposal arrangements are arranged and undertaken.

Exclusion Zones

Exclusion zones are typically established / demarcated and or managed by;

- / Solid barricades such as hoarding, barriers (concrete or water filled), crowd fencing, fixed fencing, temporary fencing, power webbing etc.
- / Exclusion zones must be clearly sign posted to warn of dangers.
- / Exclusion zones should have clear entry/exit points.
- / As required, exclusion zones may require the assistance of spotters.

Work at Height

Refer to *Procedure – Work at Height*

Traffic Management and Movement

Refer to *Procedure – Traffic Management*

Operational Plans

The **Site Manager** is required to update project operational plans to reflect site operational conditions (*Traffic Movement Plan, Services Plan, Evacuation Plan etc.*)

PROCEDURE ASBESTOS MANAGEMENT



Refer to *Procedure: Working around live services*

Refer to *Procedure: Traffic Management / Movement*

Refer to *Procedure: Emergency Management*

End of Shift Inspection

At the end of each shift / close of each day, the **Site Manager** is required to review / inspect the work area to confirm that required control measures are in place and, that the work area is safe / secure.

Observations should be recorded in the *Weekly Site Inspection*

Refer to *Procedure: Performance Management*

ACTIVITY COMPLETION

WORK AREA REVIEW

At the end of each shift / close of each day / completion of work activities for which the Permit was issued, the **Site Manager** and Subcontractor Supervisor is required to review / inspect the work area to confirm that required control measures are in place and that the work area is safe / secure, and no further hazards / risks exist.

CLEARANCE CERTIFICATION

A Clearance Certificate is a document issued by a licensed Asbestos Assessor to confirm that:

- / There is no visible asbestos residue remaining in the removal area or in the surrounding area.
- / The work area is deemed to be free of airborne contaminants.

A Clearance certificate is required for all asbestos removal work on completion of the asbestos removal work (i.e. for each work area) and prior to any other works being permitted in the removal areas.

Clearance Certificates must be made available to any person who has access to the project site and posted on the site notice board.

DOCUMENTATION CLOSE OUT

After completion of the work, the **Site Manager** is required to close out the Permit.

Refer to *Procedure: Permit Management*

ADDITIONAL INFORMATION

LEGISLATION REFERENCE

National	www.safeworkaustralia.gov.au
Victoria, Western	Refer to State Legislation
Code of Practice	How to Management and Control Asbestos in the workplace – Code of Practice 2018
Australian Standards	AS2601-2001 – <i>The Demolition of Structures</i>

PROCEDURE ASBESTOS MANAGEMENT

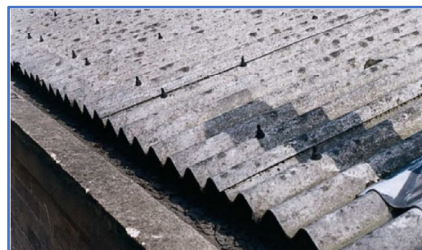


EXAMPLES

Asbestos Fire Retardant



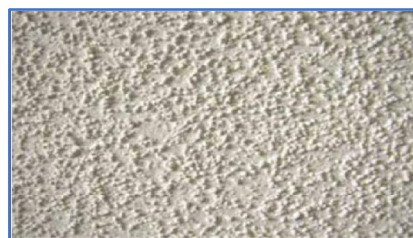
Asbestos Roof Sheeting



Asbestos Piping



Asbestos Popcorn Ceiling



Asbestos - Air monitoring



Asbestos - Register / Removal Plan



Asbestos - Waste Management



Asbestos - Identification



Asbestos - Sampling

Asbestos - Encapsulation

PROCEDURE ASBESTOS MANAGEMENT



ACM - Unexpected finds

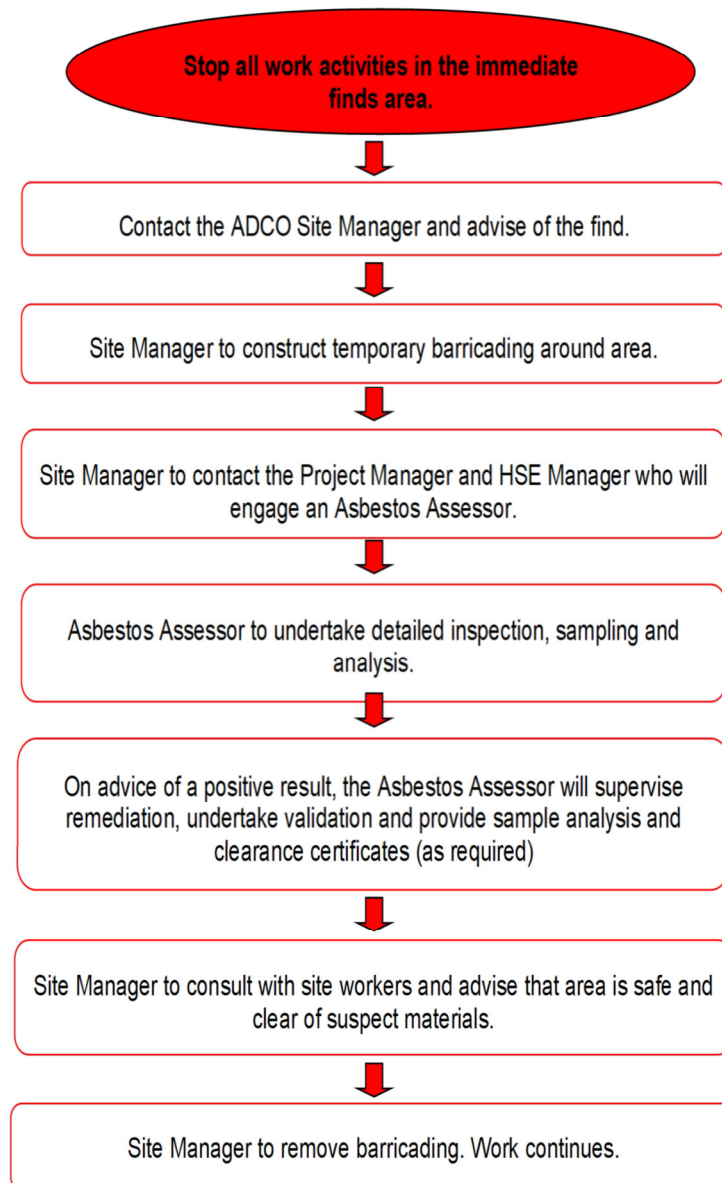


PPE - Personal protective equipment



Unexpected Finds Protocol

ACTIONS TO BE FOLLOWED WHEN SUSPECT MATERIALS ARE FOUND



APPENDIX 3- CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT SUB PLAN



Construction Traffic

Management Plan

TAFE NSW IATC
2-44 O'Connell Street, Kingswood

10 August 2022
Revision :006



Document Control

Issue	Date	Issue Details	Author	Reviewed
6	10/08/22	Updated with Escort Vehicle use	PB	PB

ADCO PROJECT PERSONNEL CONSULTATION AND SIGN OFF

We, the undersigned, confirm that we have been consulted on the contents of this document providing opportunity for input. The undersigned is to confirm that I have read and understood the contents of this document and agree to implement the requirements of this Plan on this project site.

Note: acknowledgment can also be confirmed through a toolbox meeting documented through Hammertech.

Name	Position	Acknowledgment
Simon Brown	Site Manager	
George Baliotis	Site Foreman	
Rob Torchia	Site Foreman	
Kieran Hill	Project Engineer	
Matthew Olszewski	Project Engineer	
George Awad	Project Engineer	
Russell Eccles	HSE Advisor	
Andrew Roman	Services Manager	
Jed Nicholl	Senior Contract Administrator	
Rami Mehzer	Contract Administrator	
Nick Moldrich	Senior Design Manager	
Harrison Crouch	Cadet- CA	
Mark Zabica	Cadet- Engineer	
Tyler Barker	Construction Worker	
Nick Meagher	Construction Worker	
Darrell Price	Construction Worker	
Max Evans	Apprentice	
Dean Israel	Construction Manager	
Pierce Brennan	Project Manager	

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1. Introduction

1.1 Project Description

The IATC is proposed to be located within the TAFE NSW Nepean Kingswood Campus (TAFE Kingswood) as shown in Figure 1. The overall campus is bounded by the Great Western Highway to the north and O'Connell Street to the west. It is noted that the Western Sydney University (WSU) Werrington South Campus is situated to the east of the TAFE Kingswood Campus. Vehicular access to the TAFE Kingswood site is provided via the O'Connell Street frontage.

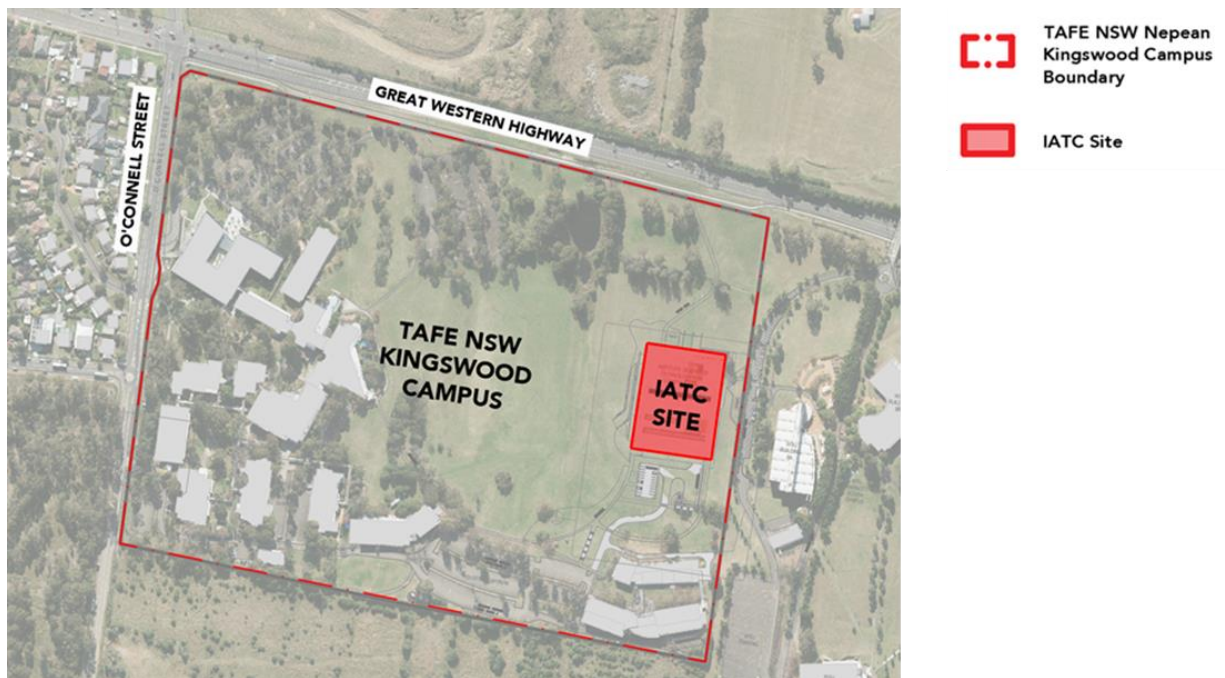


Figure 1.1 - Location Plan

2. Site Context

2.1 Site Location

The TAFE NSW Nepean Kingswood campus is located approximately 50km from Sydney CBD as the crow flies, 6km from Penrith and is on the outskirts of the Blue Mountains National Park. Kingswood is one of the 37 suburbs that form the City of Penrith local government area (LGA).

The site occupies part of the traditional lands of the Darug people, with the area first incorporated as a municipality in May 1871.

The campus has its primary access from O'Connell Street, a local road providing connection to the Great Western Highway with access to Transport for NSW bus routes both on O'Connell Street and on the Great Western Highway. Kingswood Station is approximately 2.5km to the west.

2.2 Surrounding Land Uses

The site lies within an SP2 - Educational Establishment Zone as defined by the NSW Department of Planning, Industry and Environment and is illustrated in Figure 2.1.

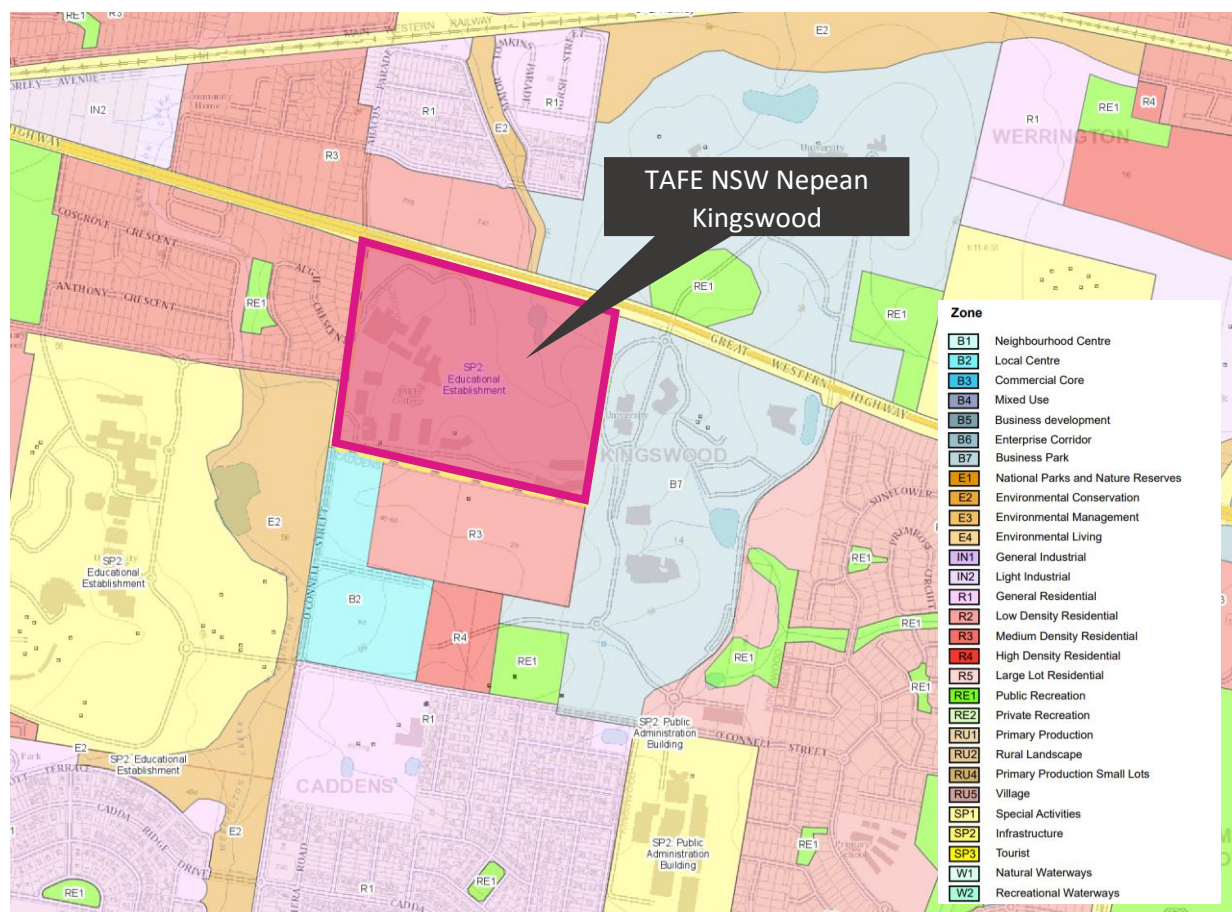


Figure 2.1 - Local Land Use Map (source: NSW Planning Viewer)

2.3 Development Site

The proposal relates to the following sites:

- Lot 1, DP866081

The property has a total site area of 22.77 hectares and situated to the east of Western Sydney University Kingswood and to the west of Western Sydney University Werrington.



Figure 2.2: Aerial View of Site and Surrounds (source: SIXMAPS)

2.4 Development Proposal

As outlined within the Environmental Impact Statement prepared by Urbis (dated 10 March 2021), the project involves the following works which are related to the scope of this Construction Traffic Management Statement:

- *Construction of a three-storey educational facility with a building height of 18.5m and a total GFA of 7,857sqm accommodating both internal and external learning spaces, an auditorium, collaboration / breakout spaces, practical workshop areas and external terraces. The educational facility will provide:*
 - *Principal building entries on the eastern and western building frontages, level with the adjacent sloped terrain. Secondary access points are located on the northern and southern building frontages. Internal circulation will be provided via two stairways, two lift cores and breezeways.*
 - *Workshop spaces provided with both single, double and triple-height volumes to accommodate a range of physical activities associated with trade and construction courses.*

- A specialised industry engagement area on the eastern elevation of the building.
- An internal café kiosk for use of TAFE NSW students and employees.
- Installation of rooftop photovoltaic panels.
- End of trip facilities.
- Plant, storage and amenities dispersed where required throughout the building.
- Provision of an at-grade car parking, loading and access area on the building's southern frontage with:
 - 16 car parking spaces (including 1 accessible) and 26 bicycle spaces within a bicycle storage area.
 - A loading and waste collection area.
- Alteration to the existing vehicular entry/ exit point (Gate 2) on O'Connell Street to widen the width of the vehicular access and remove the existing road median, and extension of the existing internal vehicular access network to provide vehicular access to the development on the southern elevation.

The proposed layout of the IATC and widening of TAFE NSW Gate 2 is shown in Figure 2.3.

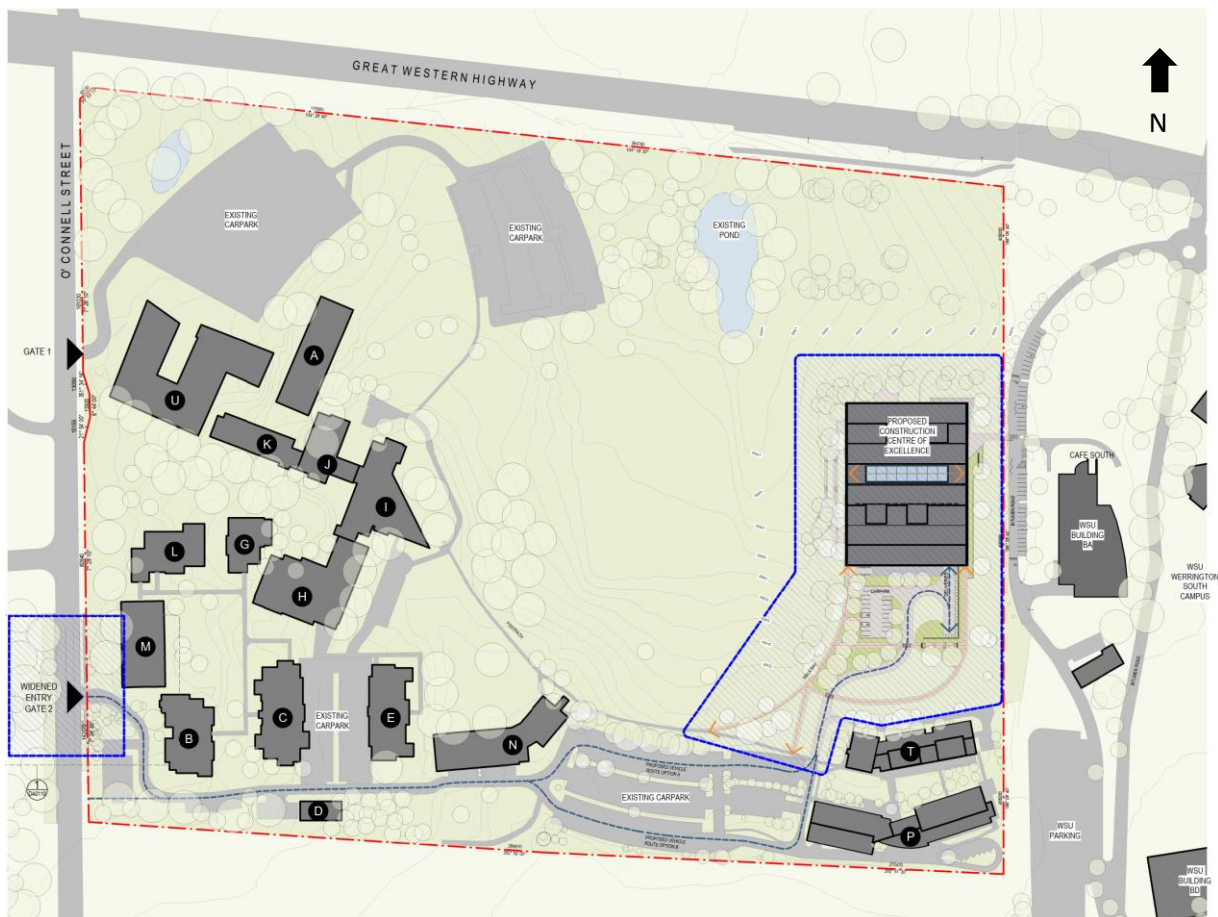


Figure 2.3 – TAFE NSW IATC Proposed Site Plan (Source: Gray Puksand)

3. Existing Transport Facilities

3.1 Road Hierarchy

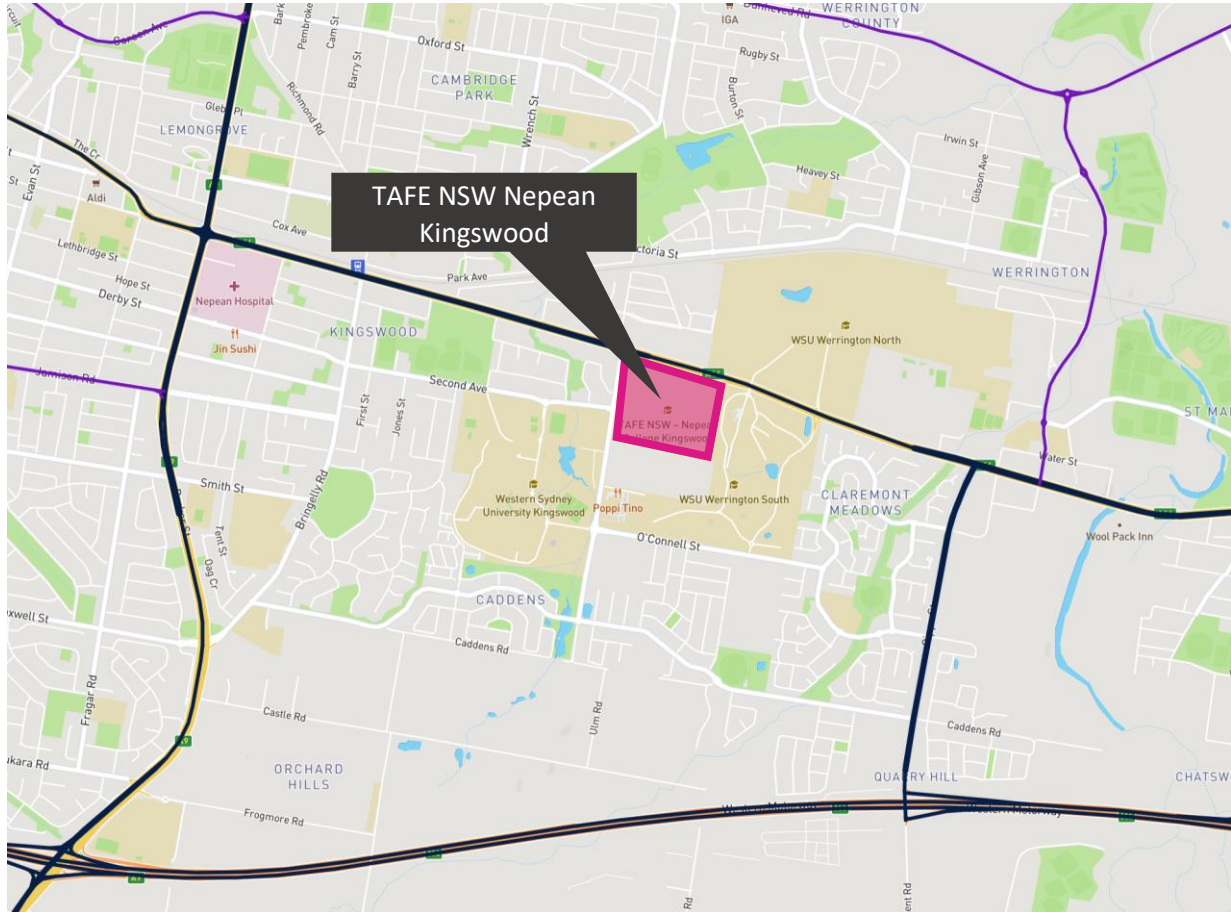


Figure 3.1 - Road Hierarchy (Source: TfNSW State and Regional Roads)

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

State Roads	Freeways and Primary Arterials (TfNSW managed)
Regional Roads	Secondary or sub arterials (Council managed, partly funded by the State)
Local Roads	Collector and local access roads (Council managed)

The existing road network is shown in the following tables:

Table 3.1 - Existing Road Network – Great Western Highway

Great Western Highway	
Road Classification	State Road
Alignment	East-West
Number of Lanes	3 lanes in each direction
Carriageway Type	Divided
Carriageway Width	Approximately 24.1m
Speed Limit	60km/h (Eastbound) and 80 km/h (Westbound)
School Zone	No
Parking Controls	No Stopping
Forms Site Frontage	Yes



Figure 3.2: Great Western Highway (source: Google Maps)

Table 3.2 - Existing Road Network – O'Connell Street (North-South)

O'Connell Street (North-South)	
Road Classification	Local Road
Alignment	North - South
Number of Lanes	1 lane in each direction with parking lanes on either side of the carriageway
Carriageway Type	Divided
Carriageway Width	Approximately 7.2m
Speed Limit	50 km/h
School Zone	No
Parking Controls	Generally unrestricted, but otherwise No Stopping or Bus Zones
Forms Site Frontage	Yes



Figure 3.3 – O'Connell Street, Northbound (Source: Google Maps)

Table 3.3 - Existing Road Network – O'Connell Street (East-West)

O'Connell Street (East-West)	
Road Classification	Local Road
Alignment	East - West
Number of Lanes	A single lane in each direction with parking lanes on either side of the carriageway
Carriageway Type	Divided (by white barrier lines)
Carriageway Width	Approximately 7.1m
Speed Limit	50 km/h
School Zone	No
Parking Controls	No Restrictions
Forms Site Frontage	Yes



Figure 3.4: O'Connell Street Eastbound (source: Google Maps)

Table 3.4 - Existing Road Network – First Avenue

First Avenue	
Road Classification	Local Road
Alignment	North – South
Number of Lanes	A single lane in each direction
Carriageway Type	Undivided
Carriageway Width	Approximately 18m
Speed Limit	50 km/h
School Zone	No
Parking Controls	No
Forms Site Frontage	Yes



Figure 3.5: First Avenue Southbound (source: Google Maps)

Table 3.5 - Existing Road Network - Third Avenue

Third Avenue	
Road Classification	Local Road
Alignment	East - West
Number of Lanes	A single lane in each direction
Carriageway Type	Undivided
Carriageway Width	Approximately 6.8m
Speed Limit	40 km/h
School Zone	No
Parking Controls	No
Forms Site Frontage	Yes – internal road



Figure 3.6: Third Avenue Westbound (Source: Google Maps)

Table 3.6 - Existing Road Network – King Street

King Street	
Road Classification	Local Road
Alignment	North - South
Number of Lanes	A single lane in each direction
Carriageway Type	Undivided
Carriageway Width	Approximately 6.8m
Speed Limit	40 km/h
School Zone	No
Parking Controls	No
Forms Site Frontage	Yes – internal road



Figure 3.7: King Street Northbound (Source: Google Maps)

Table 3.7 - Existing Road Network – Fourth Avenue

Fourth Avenue	
Road Classification	Local Road
Alignment	East - West
Number of Lanes	A single lane in each direction
Carriageway Type	Undivided
Carriageway Width	Approximately 7.5m
Speed Limit	40 km/h
School Zone	No
Parking Controls	No
Forms Site Frontage	Yes – internal road



Figure 3.8: Fourth Avenue Eastbound (Source: Google Maps)

3.2 Key Intersections

The major intersections in the vicinity of the development site and their characteristics are listed below:

1. O'Connell Street / Great Western Highway: traffic signal controlled, 4-leg intersection
2. First Avenue / Great Western Highway: traffic signal controlled, 4-leg intersection

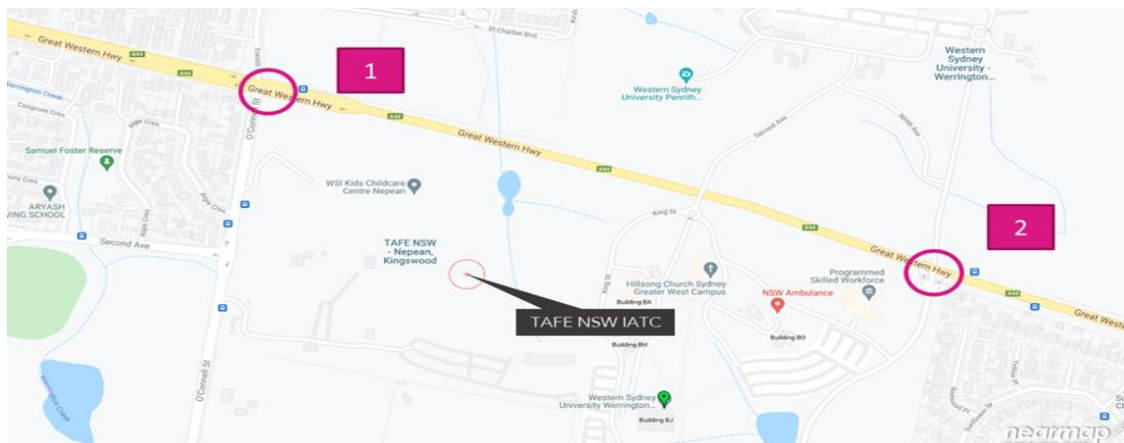


Figure 3.9 - Key Intersections (Source: Nearmap)

3.3 Public Transport

The locality has been assessed in the context of available forms of public transport that may be utilised by prospective staff and visitors. When defining accessibility, the NSW Guidelines to Walking & Cycling (2004) suggest that 400m-800m is a comfortable walking distance. The area of comfortable walking distance is shown in Figure 3.10.

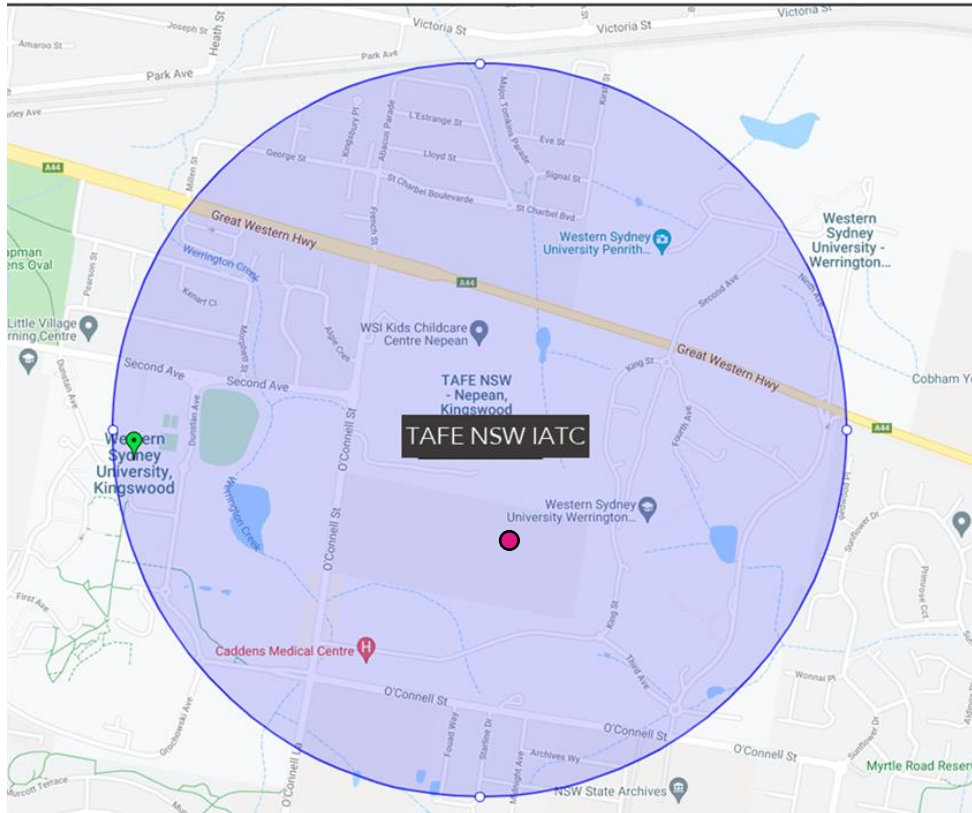


Figure 3.10 - Public Transport Accessibility (Source: Nearmap)

3.3.1 Bus Services

The subject site is well serviced with multiple bus stops within a comfortable walking distance. A summary of the available bus routes that service the site is shown in Table 3.8.

Table 3.8 - Bus Route Summary

Route	Coverage	Frequency (approx.)
770	Mount Druitt to Penrith via St Marys	<p>Mondays to Fridays: Every 30 minutes</p> <p>Saturdays: Every 1 hour</p> <p>Sundays and Public Holidays: Every 1 hour</p>
775	Mount Druitt to Penrith via Erskine Park	<p>Mondays to Fridays: Every 12 minutes to 30 minutes</p>

Route	Coverage	Frequency (approx.)
		Saturdays: Every 1 hour Sundays and Public Holidays: Every 1 hour
776	Mount Druitt to Penrith via St Clair	Mondays to Fridays: Every 30 minutes Saturdays: Every 1 hour Sundays and Public Holidays: Every 1 hour
835	WSU Penrith to Prairiewood	Mondays to Fridays: Every 15 minutes

In addition, WSU also runs a shuttle bus service. More information concerning the WSU Shuttle Bus Service can be found on the website:
https://www.westernsydney.edu.au/campus_safety_and_security/security/accessibility_transport_parking/shuttle_bus_timetable

3.3.2 WSU Shuttle Bus

Western Sydney University runs a shuttle bus service which operates between Kingswood Station and the WSU Kingswood Campus. The shuttle bus service runs approximately every 35 minutes between 7am and 10am weekdays and would serve the students, staff and visitors of WSU.

Access to the existing shuttle bus stops within the WSU Campus will be maintained during the construction works.

3.3.3 Train Services

The TAFE Nepean Kingswood Campus is not within walking distance of the nearest train stations. Students can use the buses to connect to Penrith, St Mary and Mount Druitt Train Stations.

3.4 Active Transport

Figure 3.10 shows the extent of cycle infrastructure within the surrounding area of the subject site. The site is reasonably serviced by a range of cycleways (freeway, hard difficulty, moderate difficulty, low difficulty and off-road).

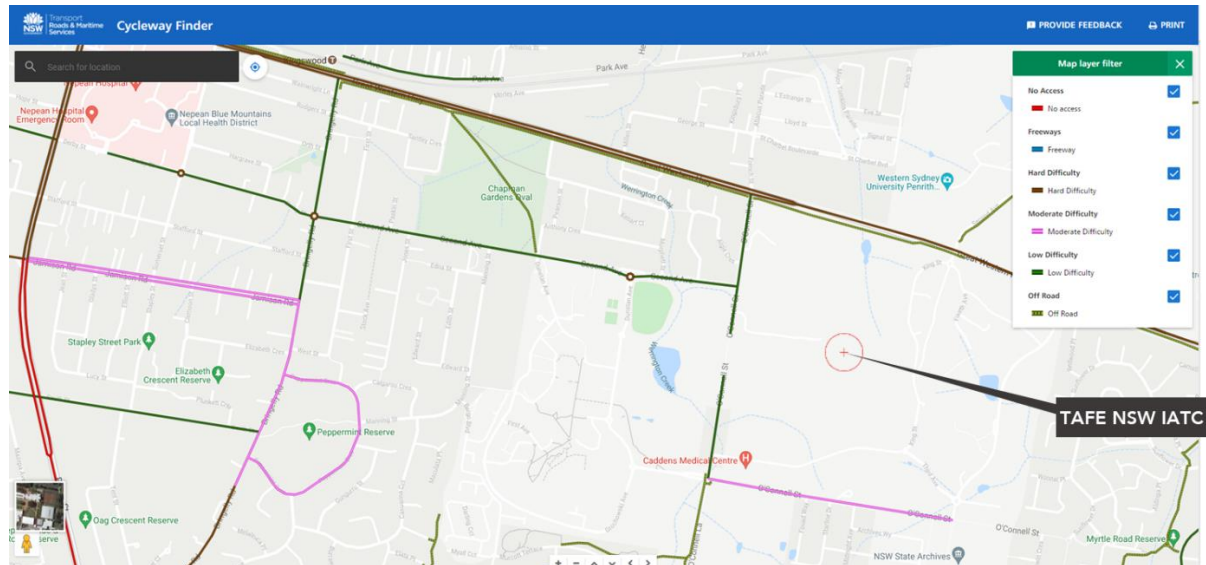


Figure 3.11 - Cycleways (Source: NSW Cycleways Finder)

4. Traffic Management Plan

4.1 Traffic Management Planning Process

Temporary Traffic Management (TTM) for the project has been planned in accordance with Transport for NSW, *Traffic control at work sites – Technical Manual, Issue No.6.0*, 14 September 2020 (TCAWS). The process is shown in Figure 4.1.

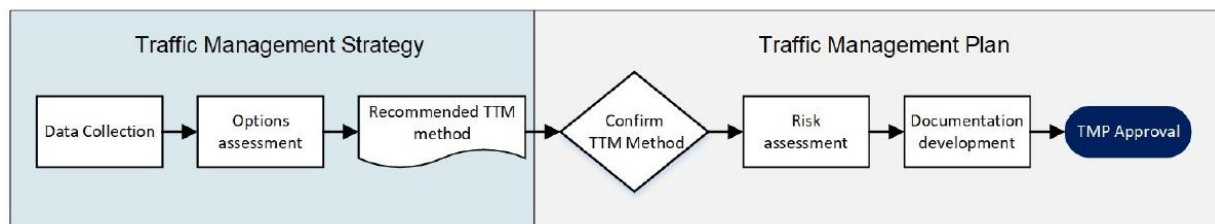


Figure 4.1 - Traffic Management Plan Process

An iterative process is being adopted in collaboration with relevant stakeholders to adopt the most appropriate traffic management approach and develop the associated documents for the work.

4.2 Traffic Management Strategy

A traffic management strategy has been chosen to ensure the safest and most efficient way for road users to interact with the work site and support the appropriate allocation of time, funds and resources for the project. The following have been considered in determining the TTM method:

Detour options

No detours are necessary or proposed by the client and therefore, disproportionate amount of disruption to the road users will NOT be introduced.

Site location

The site is the TAFE NSW Nepean Kingswood Campus with access roads to the site through the WSU internal road network.

To facilitate construction vehicle access to and from the works site, an Access Deed between TAFE NSW and WSU has been executed which governs construction traffic access within the WSU Werrington Campus road network associated with the TAFE NSW IATC project.

The access roads to the works site contains slight curves (First Avenue, Third Avenue, King Street, Fourth Avenue as well as the internal roads of the TAFE NSW Nepean Kingswood Campus), roundabouts, vegetation, existing signage and infrastructure that may obstruct signs and devices needed for certain strategies.

Work area

The area needed to safely perform the work does not require full closures of any sections of the road.

Vulnerable road users

Desire lines of pedestrians, cyclists, motorcyclists and users of scooters do not generally impact on works or create undesired interaction between these road users and traffic. At some locations, pedestrian crossings are located along the truck access and egress routes within the internal road network to and from the work site, appropriate signage and warning measures will be put into place to ensure safety of pedestrians.

Community facilities and needs

The WSU Campus is located in the vicinity of the site will be affected by the works. Appropriate traffic management measures will be put in place to mitigate any impacts. Ongoing stakeholder engagement meetings will be held on a regular basis at which the performance of the traffic management will be reviewed.

4.3 Decision of TTM Method

After considering the factors in Section 4.2 and the recommendation of the client, the TTM method chosen is “Around (elimination)” as traffic can and will be completely separated from the work area. This method will provide the lowest overall net risk option.

5. Overview of Construction Program

5.1 Staging and Program

The project will be undertaken with three phases commencing in November 2021 and is expected to be completed by March 2023 (approximately 17 months).

The possession date of the site is 1st November 2021.

The three phases of this construction program are as follows:

Table 5.1: Construction Program

Phase	Works	Date	Timeframe
1	Inground and Substructure Works	1 st November 2021 until 25 th January 2022	3 months
2	Structural and Façade Works	25 th January 2022 to 30 th September 2022	8 months
3	Fitout till Completion	30 th September 2022 until April 2022	8 months
		Total	19 months

During the project, the maximum expected vehicle size is a 19m Articulated Vehicle (AV). Smaller vehicles including 19m Truck and Dogs, 12.5m Heavy Rigid Vehicles (HRVs) and 8.8m Medium Rigid Vehicles (MRVs) and will also be utilised at various stages of the project. The number of estimated daily truck trips are outlined in Section 6.1.

5.2 Hours of Work

All works associated with the project shall be undertaken in accordance with the permitted hours of work as outlined within the SSD-8571481 DA Conditions of Consent:

- **Mondays to Fridays:** 7am to 6pm
- **Saturdays:** 8am to 4pm
- **Sundays and Public Holidays:** No works to be carried out.

5.3 General Requirements

In accordance with TfNSW requirements, all vehicles transporting loose materials will have the entire load covered and/or secured to prevent any items, excess dust or dirt particles depositing onto the roadway during travel to and from the site. All subcontractors shall undergo a site induction facilitated by the lead contractor / project manager to ensure all procedures are met for all vehicles entering and exiting the construction site. The lead contractors will monitor the roads leading to and from the site and undertake all necessary steps to rectify any road deposits caused by the construction activity.

Vehicles operating to, from and within the site shall do so in a manner that does not create unreasonable or unnecessary noise or vibration. No tracked vehicles are required nor permitted on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances.

The applicant/contractor is required to follow and abide the specific standard requirements for construction management including the requirements of the TAFE NSW / WSU Access Deed Agreement. An Access Deed Management Plan prepared by ADCO Constructions has been included in Attachment 6.

6. Construction Traffic Management Plan

6.1 Construction Traffic Types and Volumes

The construction will be undertaken in three different stages and will require access and egress for various vehicles depending on the stage. The largest expected vehicle types for each stage have been summarised in Table 6.1.

Table 6.1 – Largest Expected Vehicle Types during each Phase

Phase	Works	Largest Expected Vehicle Type	Duration
1	Inground and Substructure Works	19m Truck and Dog	1 st November 2021 – 25 th January 2022
2	Structural and Façade Works	19m Truck and Dog	25 th January 2022– 30 th September 2022
3	Fitout till Completion	19m AV	30 th September 2022 – April 2022

The movements of trucks to and from the site, and deliveries to the site are to be managed such that no queuing or temporary standing on the public roadway / domain occurs in the vicinity of the site.

Once distributed throughout the day, the relatively low construction vehicle movements will have minimal impact on the performance of the local road network during the morning and evening peaks. Table 6.2 and Table 6.3 shows the anticipated construction schedules from October 2021 to March 2023.

Table 6.2 - Construction Schedule 1

Phase	Description of Works during Stage	Largest Expected Vehicle Type	Estimated Peak Traffic Volume
1 (12 weeks)	<ul style="list-style-type: none"> Inground and Substructure Works 	19m Truck and Dog	Max 58 trucks/day (58 in / 58 out) (approx. 6 trucks every hour)
2 (32 weeks)	<ul style="list-style-type: none"> Structural and Façade Works 	19m Truck & Dog	Max 58 trucks/day (58 in / 58 out) (approx. 6 trucks every hour)
3 (24 weeks)	<ul style="list-style-type: none"> Fitout till Completion 	19m AV	Max 30 trucks/day (30 in / 30 out) (approx. 3 truck per hour)

Table 6.3 - Construction Schedule 2

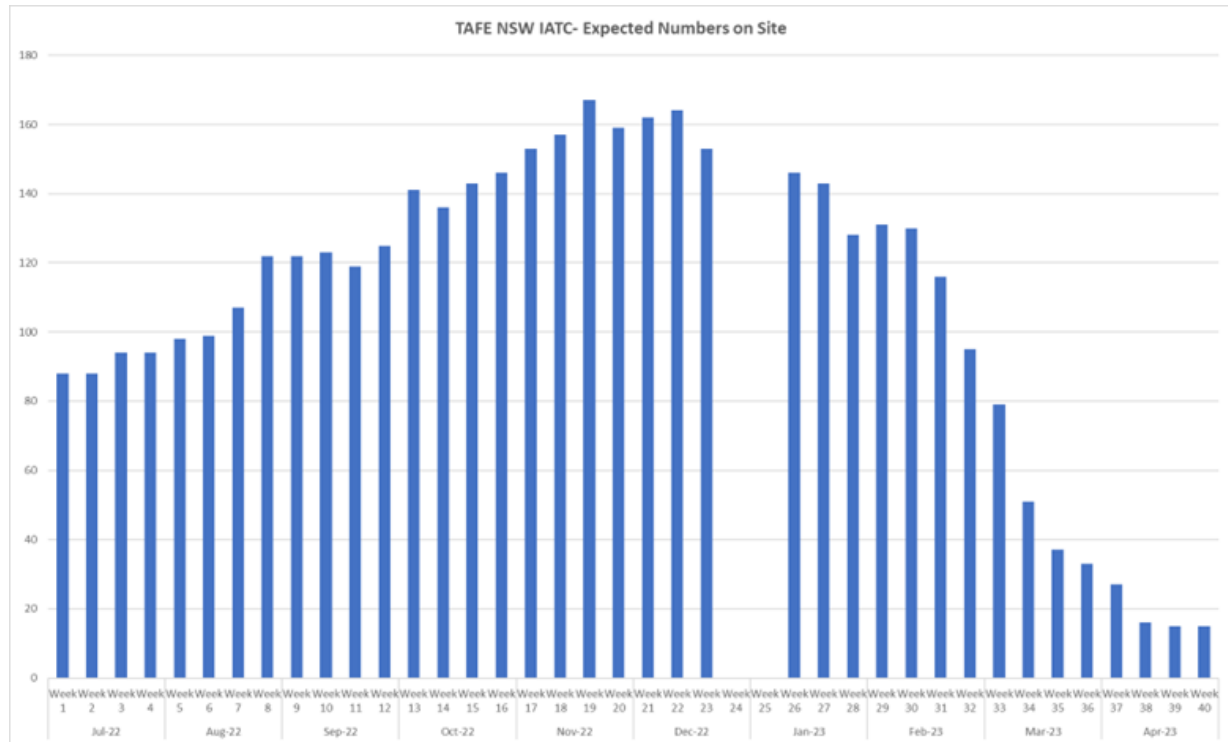


Figure 6.1 - Estimated No. of Workers & Trucks on site per day

As shown in Figure 6.1, the estimated peak daily construction traffic volume of 58 trucks/day occurs from January 2022 to June 2022. The majority of the construction vehicles during this peak period is associated with the concrete pours associated with Phase 2 - Structural and Façade Works. The average concrete pour volume is approximately 300-400m³ and this will be facilitated using concrete agitator trucks which have average capacities of 6.5-8 m³. The remainder of the construction traffic volumes would typically be associated with scaffold and steel reinforcement deliveries.

6.2 Construction Vehicle Routes and Access

The TAFE Kingswood site is primarily serviced by Great Western Highway (State road) to the north, First Avenue to the east and O'Connell Street to the west which are classified as local roads. The proposed construction vehicle routes have regard for the surrounding traffic arrangements within the vicinity of the site.

There are three proposed routes to access the TAFE Kingswood site, dependent on the location of the associated works, being either at the IATC site or the widening of the existing TAFE NSW Gate 2 driveway. It is noted that construction worker vehicles will access the site via Gate 2 and will park within the site boundary.

A summary of the vehicular access arrangements during the various stages of the project are outlined in Table 6.4.

Table 6.4 – Summary of Vehicular Access Arrangements by each Stage

Phase	Access Arrangement
Phase 1 (prior to WSU approval of the CTMP)	<ul style="list-style-type: none"> ADCO will utilise TAFE NSW Gate 2 for all traffic movements.
Phase 2 – Part 1 (WSU endorsed CTMP)	<ul style="list-style-type: none"> ADCO construction vehicles will utilise the WSU internal road network. Construction worker vehicles will access the construction trades parking area via TAFE NSW Gate 2.
Phase 2 – Part 2 (TAFE NSW Gate 2 Widening Upgrade)	<ul style="list-style-type: none"> To occur while Phase 2 – Part 1 is still in operation ADCO construction vehicles will utilise the Works Zone on O'Connell Street adjacent to TAFE NSW Gate 2.
Phase 2 – Part 3 (Services Trenching)	<ul style="list-style-type: none"> To occur while Phase 2 – Part 1 is still in operation Services trenching proposed within the TAFE NSW internal roadways between TAFE Gate 2 and IATC Gate 1. ADCO construction vehicle movements for the localised services trenching to utilise TAFE NSW Gate 2 and the internal roadways through the existing TAFE car parks.

The construction vehicle routes to and from the IATC and TAFE NSW Gate 2 driveway works areas are outlined in the following subsections.

6.2.1 Works Zones

A Works Zone at the eastern side of the proposed IATC building will be provided and accessed via separate entry and exit gates on King Street.

Construction access gates to the IATC site and associated Works Zone area are proposed to be approximately 14m in width. The site access locations for the IATC site are shown in Figure 6.2, with a full-size version included in Attachment 1.

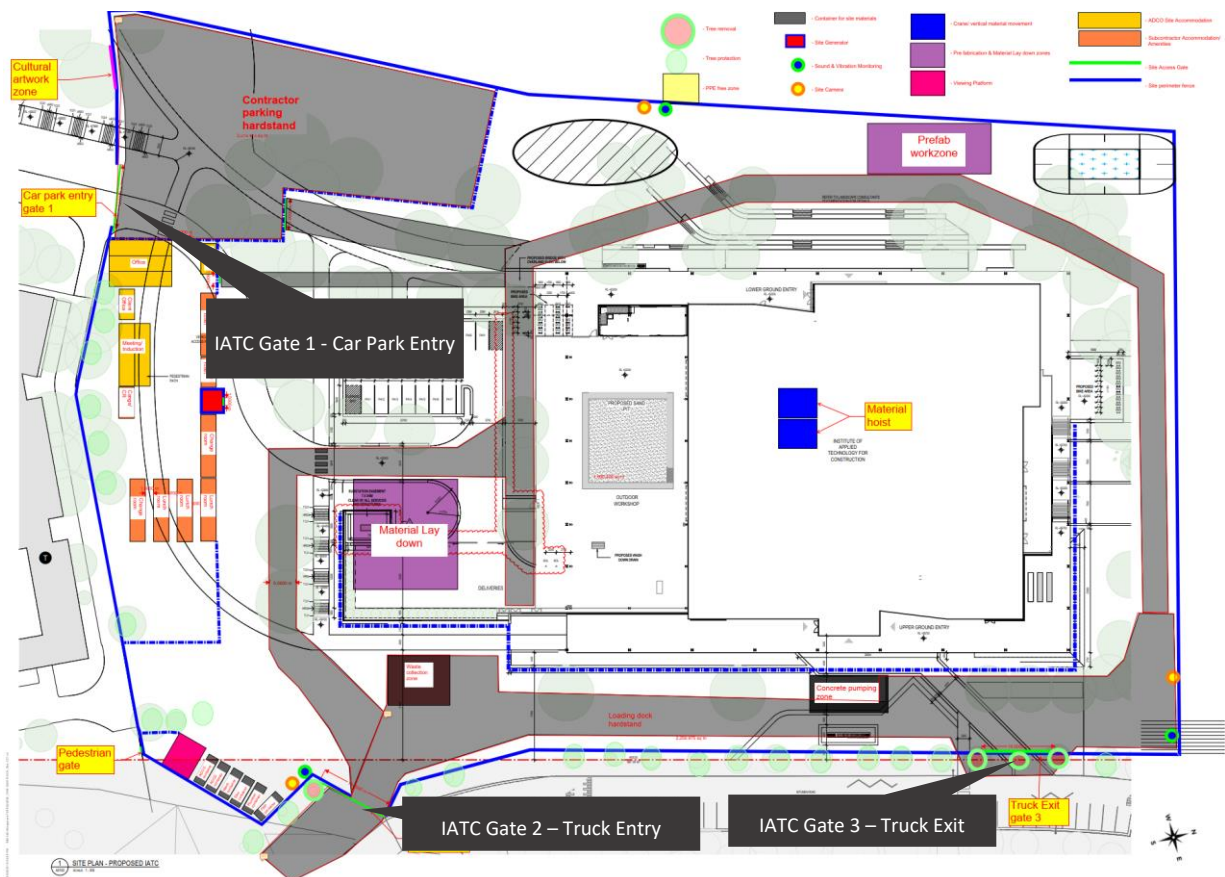


Figure 6.2 - Site Establishment Plan (Source: ADCO)

A separate Works Zone is proposed for the TAFE NSW Gate 2 driveway widening works accommodating vehicles up to 8.8m MRVs as outlined in Section 6.2.4.

6.2.2 Route 1 - IATC Site

As per the TAFE NSW/WSU Access Deed Agreement, access to the IATC site is proposed to be via Great Western Highway, First Avenue, Third Avenue and King Street. A Works Zone is proposed to be provided to the east of the IATC site, which is accessible from King Street, whereby construction vehicles will enter the Works Zone just prior to the existing at-grade car park adjacent to the WSU Building BA.

Construction vehicle access gates to the IATC site and associated Works Zone area are proposed to be approximately 14m in width. The proposed site access locations for the IATC site are shown in Attachment 1.

The swept path assessment undertaken demonstrates access and egress is possible for a 19m AV, with appropriate traffic control measures (refer to Section 6.4 and the drawings in Attachment 2 for details).

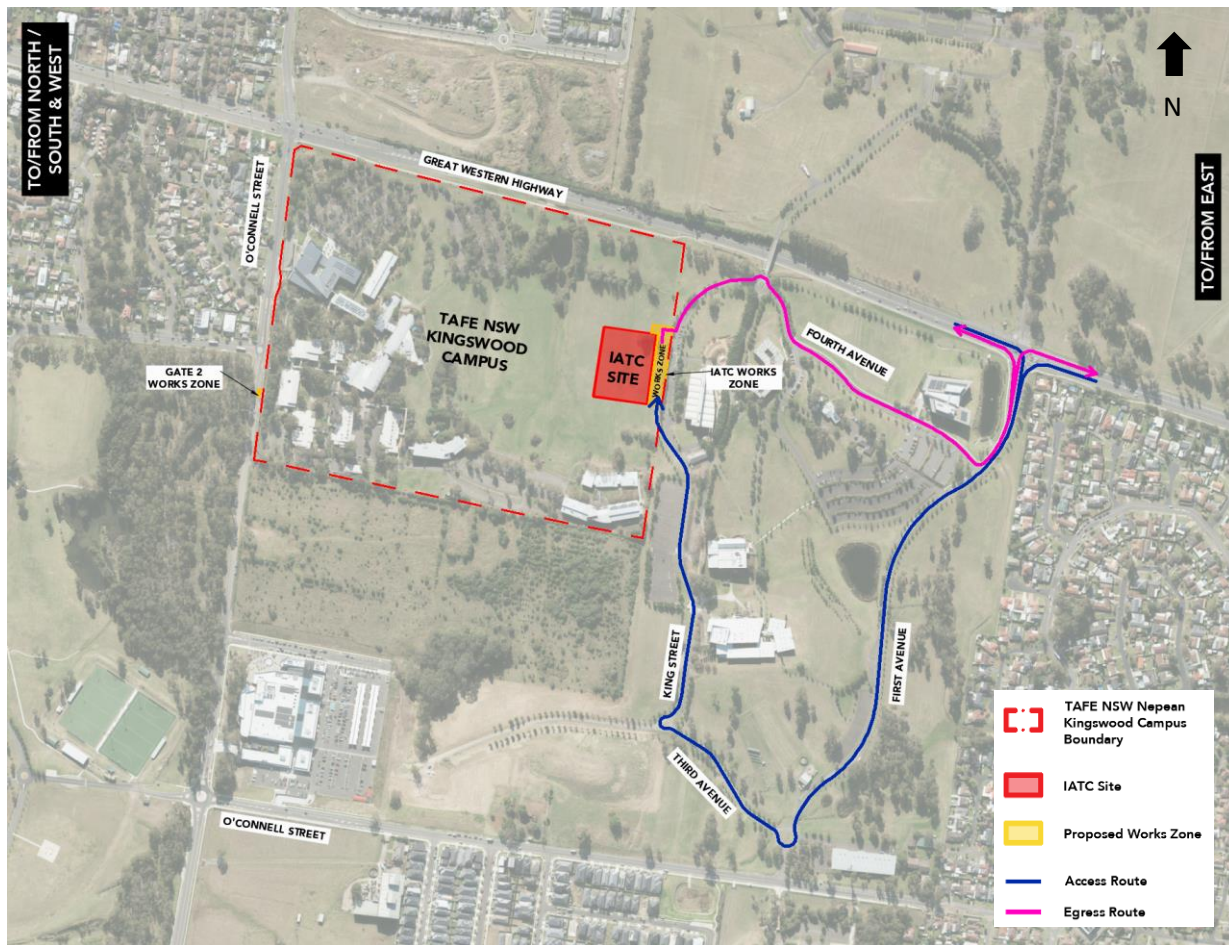


Figure 6.3 - Construction Vehicle Routes (Routes 1)

A description of the access and egress routes is outlined as follows.

Via Traffic Guidance Scheme (Attachment 3)

- **Route 1 Entry in blue (All construction vehicles)**

1. Trucks arrive along Great Western Highway, eastbound or westbound
2. Turn onto First Avenue, southbound where a traffic controller and nominated signage is placed as per Attachment 3.
3. Turn right into Third Avenue where ADCO Escort Vehicles stationed at approach to Roundabout.
4. ADCO Escort Vehicles Escort Vehicles greater than 8m into site.
5. Continue northbound to the IATC site.

- **Route 1 Exit in pink (All construction vehicles)**

1. Trucks continue along the King Street escorted by ADCO Escort Vehicles TAFE IATC project as per Attachment 3.
2. Turn left at First Avenue.
3. Turn left or right at Great Western Highway.

Via Guide Vehicles (Refer to Attachment 4 Guide Vehicle Control Plan)

- **Route 1 Entry in blue (All construction vehicles)**

6. Trucks arrive along Great Western Highway, eastbound or westbound
7. Turn onto First Avenue, southbound with a guide vehicle in front and behind the truck as per Attachment 4.
8. Turn right into Third Avenue with a guide vehicle stopping traffic from third avenue and another guide vehicle stopping traffic from O'Connell Street as per Attachment 4.
9. Turn right into King Street with a guide vehicle stopping traffic from entering the roundabout and another guide vehicle stopping traffic from King St as per Attachment 4.
10. Continue on King Street to the IATC site with guide vehicle in front and behind the truck as per Attachment 4.

- **Route 1 Exit in pink (All construction vehicles)**

4. Trucks to exit the IATC site via gate 3 on King Street with a guide vehicle in front and behind the truck as per Attachment 4.
5. Continue past Fourth Avenue with a guide vehicle stopping oncoming traffic from the bridge and another guide vehicle stopping traffic from Fourth Avenue as per Attachment 4.
6. Turn left at First Avenue with a guide vehicle stopping oncoming traffic from south bound First Avenue and another guide vehicle stopping oncoming traffic from north bound First Avenue as per Attachment 4.
7. Turn left or right at Great Western Highway.

6.2.3 Route 2 – IATC Trenching Works & Construction Trades Parking

There are trenching works proposed to be undertaken within the existing roadways connecting TAFE NSW Gate 2 to the IATC Gate 1 (car park entry) to the south of the proposed IATC building. The location of the IATC Gate 1 and the access and egress routes for the trenching works are illustrated in Figure 6.4. It is highlighted that Route 2 will predominantly be used for access and egress by construction worker light vehicles and trucks will only be accessing the site via TAFE NSW Gate 2 during the widening of the TAFE NSW Gate 2 driveway and the localised services trenching works which will only be undertaken in Phase 2-Part 2 and Part 3.

During the TAFE NSW Gate 2 widening and services trenching works, appropriate traffic, pedestrian and cyclist management measures will be established, and these are outlined in Section 6.4 and Section 6.5.

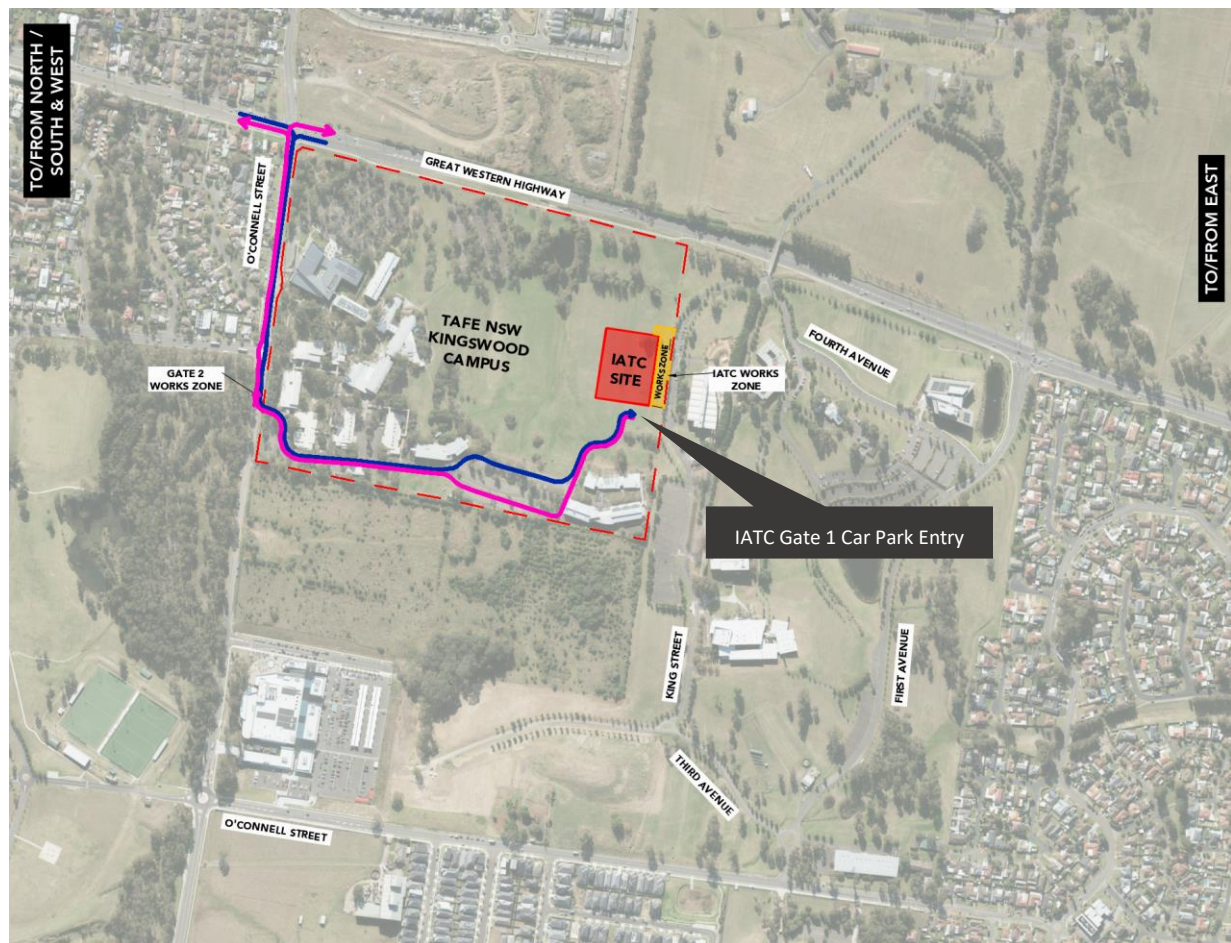


Figure 6.4 - Construction Vehicle Routes (Routes 2)

A description of the access and egress routes is outlined as follows.

- **Route 2 Entry (All construction vehicles)**

11. Trucks arrive along Great Western Highway, eastbound or westbound
12. Turn left or right into O'Connell Street.
13. Turn left into TAFE NSW Gate 2.
14. Proceed through the existing TAFE car park.

15. Continue northbound to the IATC delivery hardstand area.

- **Route 2 Exit (All construction vehicles)**

8. Trucks perform a 3-point turn within the delivery hardstand area.
9. Proceed southbound along the internal roadway connecting to the existing TAFE car park.
10. Proceed westbound through the existing TAFE car park utilising the southern-most exit aisle due to the one-way circulation of the car park.
11. Continue through the internal road network to exit via TAFE NSW Gate 2.
12. Turn right at O'Connell Street and proceed northbound.
13. Turn left or right onto the Great Western Highway.

The largest vehicle expected to access the delivery hardstand area is an 11m HIAB truck during site establishment. However, it is noted that the trenching works will typically be undertaken by vehicles up to 6.4m SRVs which are significantly smaller in size. A swept path assessment has been undertaken to demonstrate feasibility of access and egress. For the swept path assessment, the 11m HIAB truck has been modelled using a standard 12.5m Heavy Rigid Vehicle (HRV).

It is noted that access by the HRV will require the driveway separator island at TAFE NSW Gate 2 to be removed to facilitate the swept paths. Some minor kerbing works will also need to be undertaken at the intersection of the existing TAFE car park and the new roadway towards the delivery hardstand to facilitate access by heavy vehicles, as illustrated in the swept path assessment in Attachment 2.

It should be highlighted that access and egress via TAFE NSW Gate 2 to IATC Gate 1 by vehicles larger than a 6.4m Small Rigid Vehicle (SRV) will need to be restricted to outside the operational hours of the TAFE Campus. Access and egress will be managed by ADCO staff for these works.

6.2.4 Route 3 – TAFE NSW Gate 2 Driveway Widening Works

The TAFE NSW Gate 2 driveway widening works does not require construction vehicles to enter the site. However, in order to carry out the works and to facilitate the delivery of construction materials, a Works Zone is proposed to be provided within the existing road shoulder located to the north of TAFE NSW Gate 2 on O'Connell Street (refer to Attachment 2 for details of the proposed Works Zone location).

The Works Zone is proposed to be approximately 9m in length and 3.4m in width to accommodate vehicles up to 8.8m MRVs. The proposed Works Zone will require the conversion of the existing No Parking Zone to a Works Zone (subject to Council approval). The swept path assessment demonstrates an 8.8m MRV entering and exiting the Works Zone.

It is noted that there is an existing bus stop located to the south of TAFE NSW Gate 2 on O'Connell Street. The proposed driveway works at TAFE NSW Gate 2 will require the diversion of pedestrians during the works as pedestrian access to the bus stop may be affected when the widening works are being carried out. For further details of the pedestrian management measures, refer to Section 6.5.2.

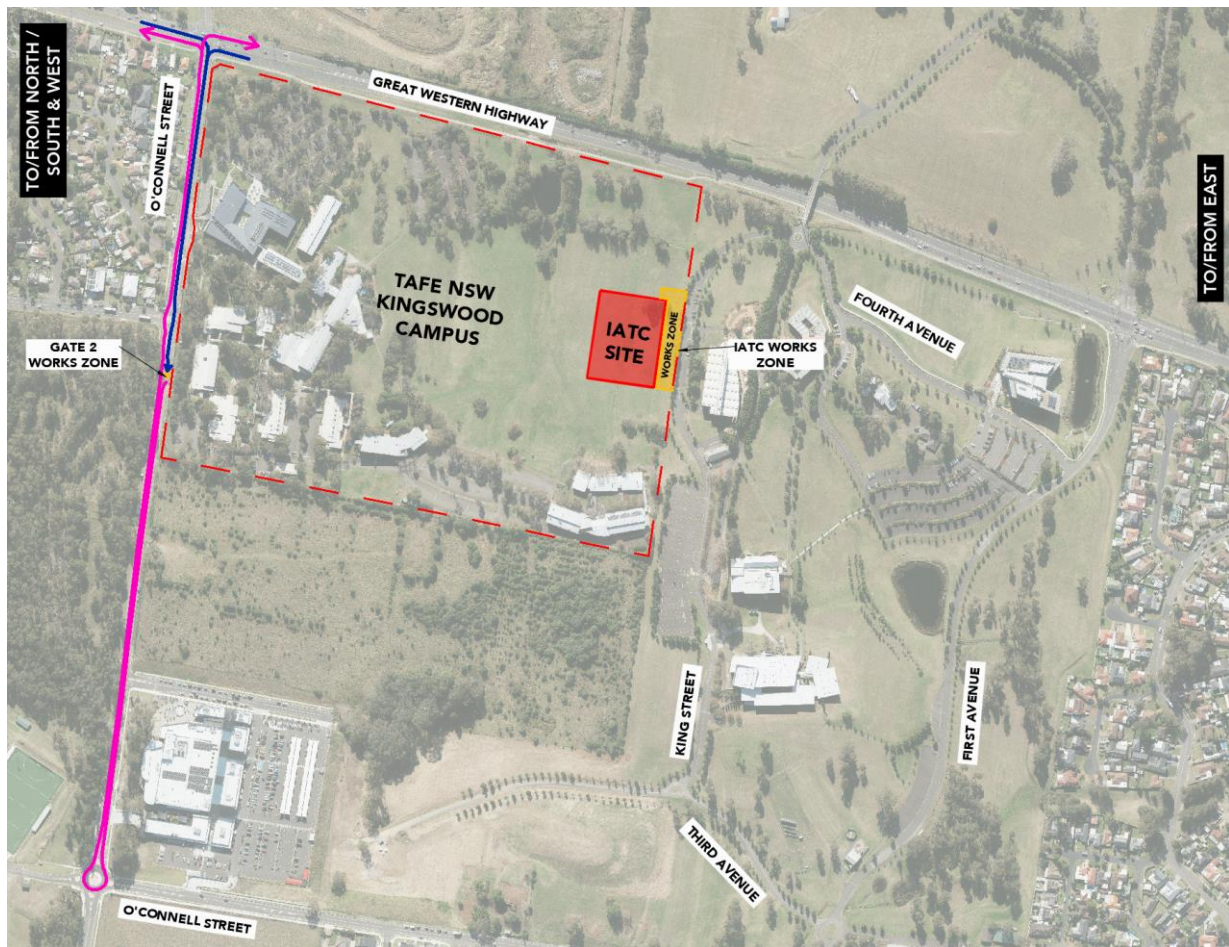


Figure 6.5 - Construction Vehicle Routes (Route 3)

• Route 3 Entry

1. Trucks arrive along the Great Western Highway, eastbound or westbound.
2. Turn left or right into O'Connell Street.
3. Continue south along O'Connell Street towards the TAFE NSW Gate 2 Works Zone.

• Route 3 Exit

1. Trucks exit out of the TAFE NSW Gate 2 Works Zone.
2. Continue south along O'Connell Street towards the roundabout intersection with O'Connell Street (east-west)
3. Make a U-Turn at the roundabout intersection.
4. Continue north along O'Connell Street towards the Great Western Highway.
5. Turn left into Great Western Highway.

A swept path assessment for access/egress to the IATC site has been undertaken using an 8.8m MRV for this route. The construction vehicle swept paths demonstrating access and egress at the key intersections have been included in Attachment 2.

6.2.5 Oversized Vehicle Access

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

6.3 Emergency Vehicle Access

The proposed traffic control arrangements do not proposed closure of any local roads. Any emergency vehicles requiring access to the project site will do so via the site accesses on O'Connell Street and First Avenue.

- NSW Police
- NSW Ambulance
- NSW SES (Fire and Rescue NSW)

6.4 Traffic Guidance Schemes

Traffic Guidance Schemes (TGSs) outlines the proposed traffic management measures to inform road users of the change traffic conditions in the vicinity of the works site. Traffic control measures are required as trucks will be turning into the site intermittently at various access points around the construction site.

It is noted that detailed TGSs are to be prepared by the appointed traffic management contractor prior to commencement of works and submitted to Council and TfNSW for approval. All TGSs associated with the CTMP must comply with the Australian Standards and the TfNSW Traffic Control at Work Sites Technical Manual (TCAWS).

Traffic controllers will play a major role in controlling traffic and will need to be provided at the following intersections:

- First Avenue / Third Avenue;
- King Street / Third Avenue;
- King Street / IATC Works Zone;
- King Street / Bitumen Road; and
- First Avenue / Fourth Avenue.

TfNSW accredited traffic controllers will be required to be stationed at the locations outlined in Table 6.5 when the vehicle type exceeds that listed in the table to manage construction and non-construction related traffic. Refer to *Drawing TRD-002* in Attachment 1 for the concept traffic controller location plan.

Table 6.5: Summary of Traffic Controller Requirements

Intersection	Traffic Management Measure	Traffic Controllers
First Avenue / Third Avenue	Traffic Controllers	Vehicles larger than an 8.8m MRV
King Street / Third Avenue	Traffic Controllers	All construction vehicles
King Street / IATC Works Zone	Traffic Controllers	All construction vehicles

Intersection	Traffic Management Measure	Traffic Controllers
King Street / Bitumen Road	Traffic Controllers	All construction vehicles
First Avenue / Fourth Avenue	Traffic Controllers	Vehicles larger than 12.5m HRV

During major concrete pours and for larger continuous deliveries, traffic control shall be established in accordance with the requirements of the TCAWS and gate controllers are to be stationed at the site access gates to manage access and egress of the site. Concept TGSs have been prepared and included in Attachment 3. It is noted that these TGSs need to be finalised by the appointed traffic management contractor.

On days where the deliveries are staggered, deliveries under 8.8m in length and concrete pours under 100 cubic metres, guide vehicles will be used to guide the truck in and out through WSU campus as per **Attachment 4** Guide Vehicle Traffic Control Plan.

6.5 Pedestrian Access

Pedestrian access to and around the works area must be maintained at all times. Detailed pedestrian movement plans will be developed by ADCO in consultation with stakeholders and incorporated where necessary into the Traffic Guidance Schemes (TGSs).

Traffic controllers will control pedestrian-vehicle interfaces at any point of confluence that does not have dedicated pedestrian pathways.

Construction workers travelling by foot or bike will follow WSU designated pedestrian routes and enter site through the controlled pedestrian gates. Construction workers travelling by car will enter the contractor parking area through TAFE NSW Gate 2 and enter the site through the controlled pedestrian gates. Subsequent pedestrian movements will be entirely within the site boundaries and will be managed in line with Site Management Plans.

6.5.1 Pedestrian Crossing Measures within the WSU Campus

Pedestrian crossing signage and advance warning signage are proposed to be installed to advise drivers of the presence of crossings as currently there are no signs indicating this at some locations within the WSU Campus. This will help in ensuring the safety for the students, staff and visitors of WSU. Specifically, the pedestrian crossings located along King Street and Fourth Avenue will require installation of the appropriate signage in accordance with *AS1742.10:2009 Pedestrian Control and Protection*. Where required, sign spacing has been adjusted to suit the specific road geometry of the site as illustrated in Attachment 3.

6.5.2 Pedestrian Diversion at TAFE NSW Gate 2

During the TAFE NSW Gate 2 driveway widening works, the existing footpath between the driveway and the bus stop on O'Connell Street will be closed. During construction work hours, pedestrians will be redirected into the TAFE grounds and utilise the pedestrian crossing to proceed to the bus stop. A temporary gate will be installed within the existing TAFE boundary fence to facilitate access to and from the bus stop.

The proposed pedestrian management controls and signage for works being undertaken during construction work hours is illustrated in Figure 6.6.

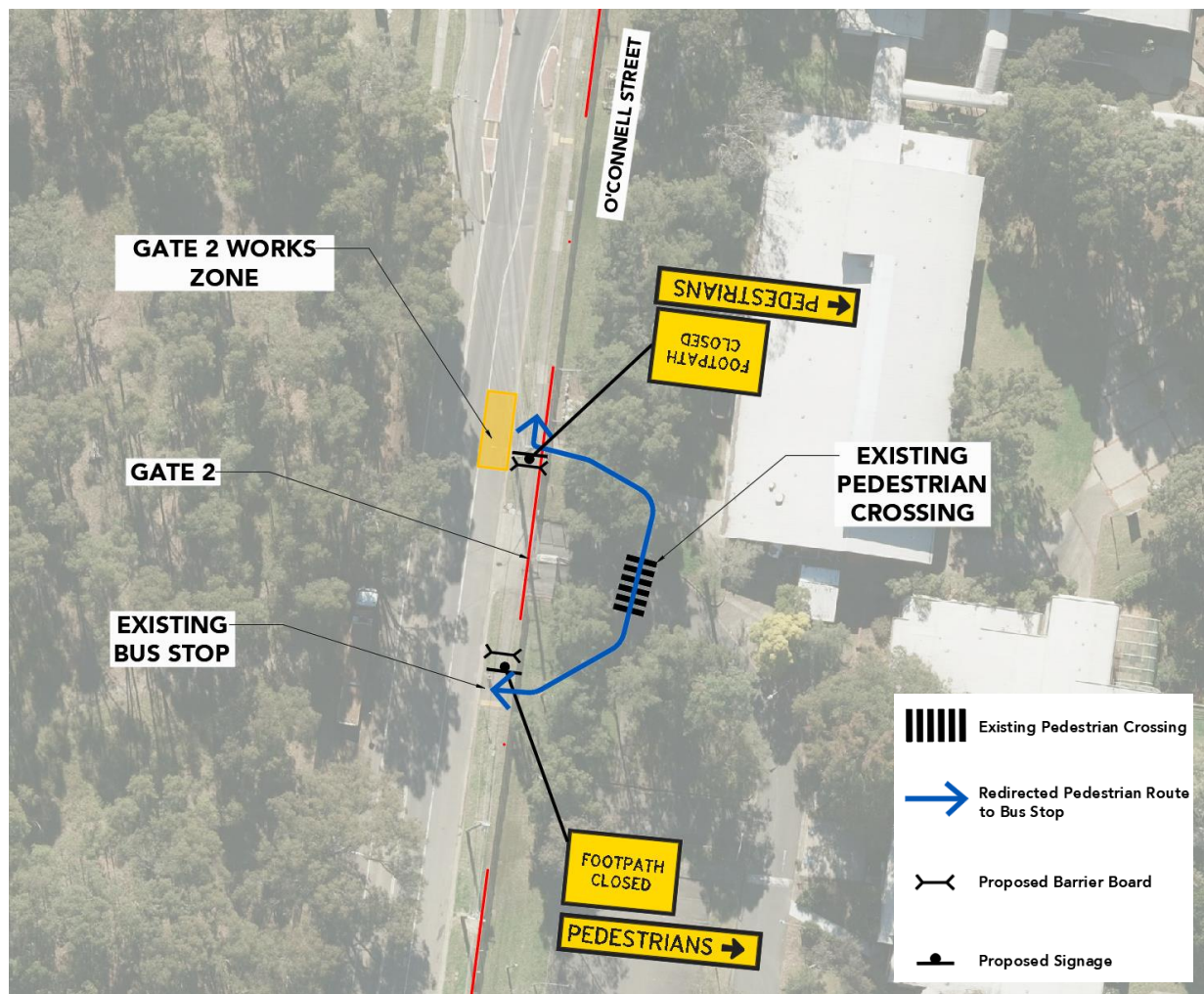


Figure 6.6 - Pedestrian Diversion Measures during Construction Work Hours

Outside of the construction work hours, the TAFE site will be secured and public access to the bus stop via the internal connections of the TAFE will not be available. To ensure access to the TAFE NSW Gate 2 bus stop is maintained outside of construction work hours for TAFE students, staff and visitors, the footpath across the TAFE NSW Gate 2 driveway will be restored to a suitable condition at the end of each day. The footpath will be re-opened at the end of each day to allow for safe pedestrian passage to and from the bus stop.

6.6 Special Deliveries

Any oversized vehicles that are required to travel to the site will be dealt with separately, with the submission of relevant permits to and subsequent approval by the Penrith City Council prior to any delivery.

6.7 Site Security

To provide segregation and protection for pedestrians and the works area, the construction site and the materials handling area are to be secured using A-class hoardings. These hoardings will be used to secure the site and define the works area.

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

- The exact locations of the hoardings are to be agreed prior to the commencement of the works.

6.8 Plant / Equipment Management

At the commencement of construction, plant and equipment, including construction scaffolding material, site sheds, mobile cranes and machinery will be required to be delivered to the site. The delivery and removal of plant and equipment to and from the site will be undertaken from the on-site materials handling/loading area, via the use of machine floats.

The delivery and removal of plant and equipment that requires a wide or long load vehicle will be subject to a separate application/permit and separate prior approval from Penrith City Council and other relevant authorities. In order to minimise traffic disruption during the delivery of the plant and equipment, it is proposed to undertake this work during the evening/early morning period. All plant and equipment deliveries will be carried out in accordance with Council's requirements and the NSW Police regulations.

6.9 Spoil Management

Contaminated material will be checked, sorted and treated prior to the removal from the site. Contaminated material will be classified in accordance with the provisions of the Protection of the 'Environment Operations Act 1997 and the NSW DECC Waste Classification Guidelines, Part 1: Classifying Waste (April 2008)'.

All construction work involving the removal and disposal of asbestos cement will be undertaken by appropriately qualified contractors duly licensed with SafeWork NSW, holding either a Friable (Class A) or a Non-Friable (Class B) Asbestos Removal License whichever applies.

During the removal of asbestos material from the site, signs containing the words 'DANGER ASBESTOS REMOVAL IN PROGRESS' will be erected in prominent visible positions on the site. The signs will be in accordance with AS1319-1994 Safety signs for the occupational environment for size, illumination, location and maintenance.

All trucks removing spoil from the site will be loaded to prescribed weight limits and loose material will be covered during transport from the site. Loose material will be removed from all vehicles and/or machinery before leaving the site and entering the road system.

All vehicles leaving the site will be cleaned. The construction contractor will be responsible for locating a truck wash facility or other appropriate cleaning mechanism adjacent to the construction access driveways. Any run-off from the washing down of vehicles will be directed to the sediment control system to be located within the site.

The loading of spoil onto trucks will be carried out on-site in an approved and controlled manner. The management of the on-site materials handling/loading area and the movement of trucks on and off the site will be the responsibility of the contractor.

6.10 Staff Induction

All staff and subcontractors engaged on site will be required to undergo a site induction. The induction will include permitted access routes to and from the construction site for all vehicles, as well as standard environmental, OH&S, driver protocols and emergency procedure. Additionally, the lead contractor will discuss TMP requirements regularly as part of toolbox talks and advise workers of public transport and carpooling opportunities.

6.10.1 Communications Protocol

During the staff inductions, all construction staff and subcontractors will be advised not to communicate between contractors, staff, students and stakeholders without prior approval from the lead contractor.

6.11 Road Closure

The western arm of the intersection of King Street and Third Avenue is currently closed and is not currently used by the public. The timeframe for the reopening of this road is unknown at the time of writing, and the CTMP will be updated to reflect any impacts associated with the reopening of the road.

Figure 6.7 illustrates the extents of the existing road closure between the Caddens Corner Shopping Centre and the King Street / Third Avenue roundabout.



Figure 6.7: Road Closure (source: Google Maps)

6.12 Occupational Health and Safety

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

6.13 Adjoining Properties

Access to all adjoining properties will be maintained throughout the works. An Access Deed between TAFE NSW and WSU has been executed. Regular review of the WSU road condition will be undertaken with maintenance to be agreed by the parties.

6.14 Method of Communicating Traffic Changes

TGSs in accordance with Australian Standards (AS1742.3 – Traffic Control Devices for Works on Roads) and TCAWS manual will advise motorists of upcoming changes in the road network.

- The contractor shall each morning, prior to work commencing, ensure all signage is erected in accordance with the TGS and clearly visible. Each evening, upon completion of work, the contractor is to ensure signage is either covered or removed as required. Sign size is to be size "A".
- No deviation from the approved TGS shall be permitted, unless otherwise approved by Council and certified by an TfNSW accredited personnel and WSU where changes impact WSU roads.
- The associated TGS road signage will inform drivers of work activities in the area including truck movements in operation.
- Prior to commencement of works on site, the contractor is to inform neighbouring properties of proposed works and provide site contact information by means of a letter box distribution. Additionally, a minimum 14 days notification must be provided to adjoining property owners prior to the implementation of any temporary traffic control measures.

6.15 Construction Trades Parking

A designated contractor parking area is provided within the site as illustrated in Figure 6.8. The construction trades parking area will be accessible via TAFE NSW Gate 2 within the O'Connell Street frontage. It is noted that the existing TAFE and WSU parking areas will be maintained, and no contractor parking will be permitted in these areas without prior agreement.

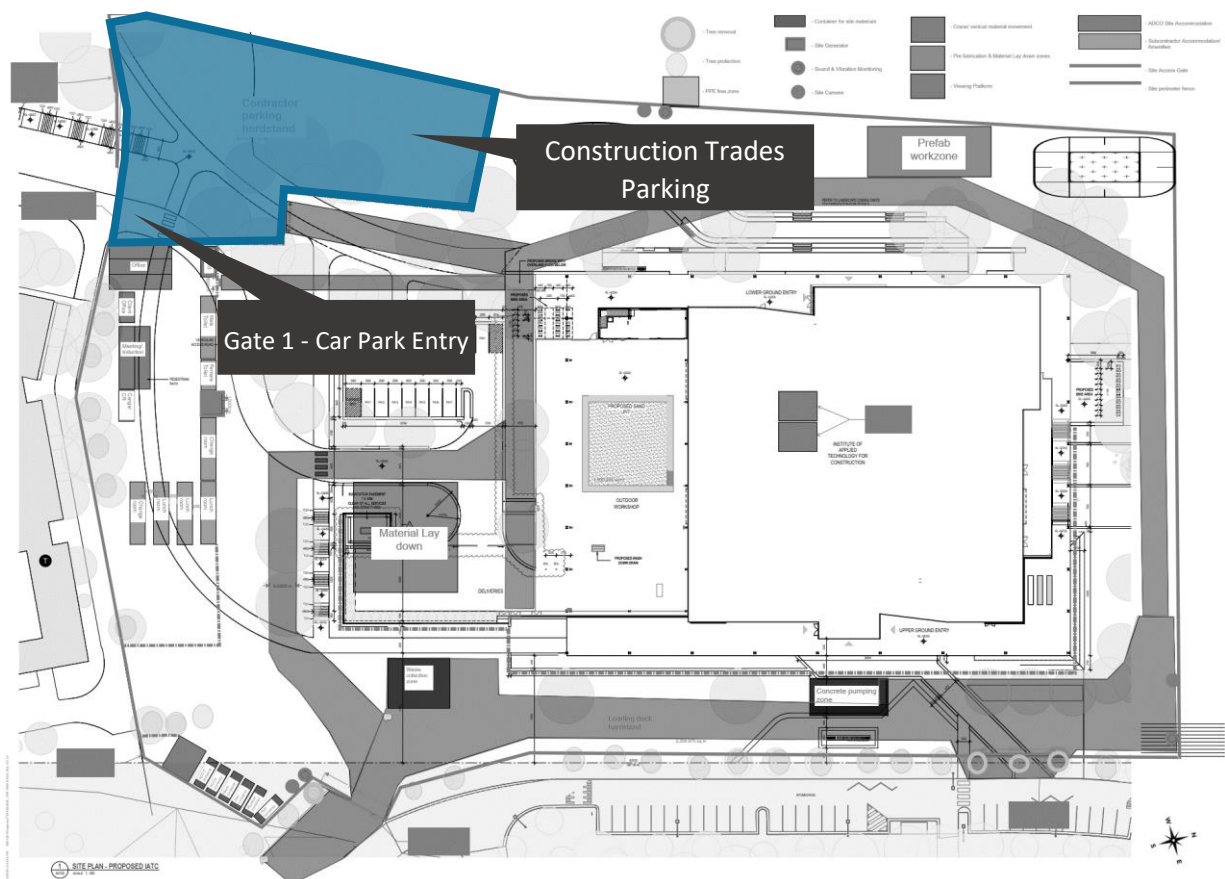


Figure 6.8: Site Establishment Plan

6.16 Driver Code of Conduct

All heavy vehicle drivers are required to follow the ingress and egress routes in a “forward in, forward out” manner as described previously, whilst adhering to all road rules and regulations. This in conjunction with the Traffic Guidance Schemes (TGS) prepared in Attachment 3 and Attachment 4 will be paramount in managing construction activity. In addition, all construction vehicles entering or exiting the site shall always operate under the direction of a TfNSW accredited traffic controllers.

This code of conduct will be advised to all drivers engaged on site at the staff induction, where all construction vehicles are to be contained within the site boundary. A Driver Code of Conduct has been prepared and included in Attachment 5.

6.17 Maintenance of Roads and Footpaths

In accordance with the TAFE NSW/WSU Access Deed Agreement, all roads and footpaths will be maintained in their proper condition during the process of the construction works. Pedestrian access will be controlled through signage and traffic controller as described previously and road closures will be undertaken in a similar fashion. Further consultation with Penrith City Council may be necessary if trees and vegetation belonging to Council is affected and an arborist will be engaged to prepare relevant reports.

6.18 Traffic Incident Management

In the event of an incident, the Project Manager is to be notified immediately. The Project Manager will then be responsible for notifying TAFE NSW and WSU of the incident.

During an emergency, construction personnel are to call the emergency number (000) before notifying the Project Manager.

Any incident that occurs within the public road shall be reported to Transport Management Centre (TMC).

6.19 Hazard and Risk Identification

All construction projects entail a set of risks—from a transport perspective—that may need to be mitigated. Some of these hazards and risks are related to:

- moving traffic
- queued traffic
- site vehicle access and egress points
- topographical constraints

A risk matrix has been prepared as shown in Table 6.6 to assess the transport risks associated with the construction work. The definitions of the risk matrix are as follows:

Likelihood (L)

- Almost unprecedented: not expected to occur in the next 100 years.
- Very unlikely: expected to occur once every 10 to 100 years.
- Unlikely: expected to occur once every 1 to 10 years.
- Likely: expected to occur once during any given year.

- Very likely: expected to occur occasionally (1 to 10 times) during any given year.
- Almost certain: expected to occur multiple times (10 or more times) during any given year.

Consequence (C)

- Insignificant: Illness, first aid or injury not requiring medical treatment. No lost time.
- Minor: Minor injury or illness requiring medical treatment. No lost time post medical treatment.
- Moderate: Minor injuries or illnesses resulting in lost time.
- Major: 1 to 10 serious injuries or illnesses resulting in lost time or potential permanent impairment
- Severe: single fatality and/or 11 to 20 serious injuries or illnesses* resulting in lost time or potential permanent impairment.
- Catastrophic: multiple fatalities and/or more than 20 serious injuries or illnesses* resulting in lost time or potential permanent impairment.

Risk Rating (R)

- Low (L)
- Medium (M)
- High (H)
- Very High (VH)

Table 6.6 - Risk Matrix

		Consequence					
Likelihood		Insignificant C6	Minor C5	Moderate C4	Major C3	Severe C2	Catastrophic C1
	Almost certain L1						
	Very likely L2						
	Likely L3						
	Unlikely L4						
	Very unlikely L5						
	Almost unprecedented L6						

The risk of the construction activities and the proposed mitigation measures are provided in Table 6.7.

Table 6.7 - Risks and Mitigations

Risk	L/C/R	Mitigation	L/C/R
Construction vehicles unexpectedly stopping/slowing down after turning off The Great Western Highway and possibly being rear-ended by other motorists	L4/C4/M	Provide adequate signage to forewarn other motorists to the presence of large construction vehicles.	L5/C5/L
Queued traffic or vehicles accessing the car park on King Street could pose manoeuvrability issue for trucks turning into and out of the site, prolong and delay the construction process	L1/C6/M	TfNSW accredited traffic controllers will be stationed at key intersections to manage and coordinate traffic to mitigate any potential for queuing.	L5/C6/L
Parked vehicles on King Street opposite IATC Works Zone may leave when a construction vehicle is exiting the IATC Works Zone	L3/C5/M	TfNSW accredited traffic controllers will manage and monitor the existing parking to prevent conflict with exiting construction vehicles.	L5/C6/L

6.20 Contact Details for On-site Enquiries and Site Access

Table 6.8 below shows the contact details of the site personnel involved in the construction project.

Table 6.8: Contact Details of the Site Personnel

Name	Position	Phone
Pierce Brennan	Project Manager	0419 422 566
Dean Israel	Construction Manager	0413 777 152
Jed Nicholl	Contract Administrator	0413 425 139
Kieran Hill	Project Engineer	0439 042 092
Simon Brown	Site Manager	0413 425 089
Rob Torchia	Site Foreman	0418 365 052

6.21 CTMP Approval, Monitoring and Review

This CTMP has been reviewed and endorsed by the designer's one-up manager who holds a current Prepare Works Zone Traffic Management Plan qualification. This approved CTMP has been used to inform the development of all TGSs for the work.

Regular monitoring and review are to be conducted throughout the life of the project to ensure that the CTMP remains current and addresses all risks at the work site for the duration of the project or activity.

To ensure that this CTMP is kept up to date, the activities identified in Table 6.9 will be undertaken to facilitate review and continuous improvement

Table 6.9 - Monitoring Activities

Stage	Activity	Purpose	Qualification	Tools and checklists
Planning	TGS verification	To ensure that the TGS selected or designed is suitable for the works and location.	ITCP or PWZTMP	TCAWS Appendix E.2 TGS verification checklist
During TTM	Weekly TTM inspections (includes preopening inspection)	To ensure that the CTMP and relevant TGS are appropriate and operating safely, effectively and efficiently	PWZTMP	TCAWS Appendix E.3 Weekly TTM inspection checklist
	Shift TTM inspections	To ensure that the TGS is implemented as designed. This includes at a minimum, twice per shift and when: <ul style="list-style-type: none"> • A TGS is installed, changed or updated. • At regular frequency afterwork commences, recommended every 2hours; and • Once after care arrangements have been installed if required 	ITCP or PWZTMP	TCAWS Appendix E.4 Shift / Daily TTM inspection checklist
	CTMP review	To ensure that CTMP controls are achieving the required outcomes.	PWZTMP	Not provided
	Client inspections	Verification of TTM through the Transport Traffic Engineering Services, Work Health and Safety Branch, Surveillance Officers or other client representatives.	Divisionally determined	Not provided
Post Completion	Post-completion inspection	To ensure that the site has been demobilised as planned and is safe for opening to traffic	ITCP or PWZTMP	Appendix E.5 Post completion inspection checklist

All relevant changes must be considered and recorded in the CTMP with any changes made by an appropriately qualified person. A copy of all documentation relating to the endorsement of the changes must be available to be accessed, either electronically or in hard copy, by the person responsible for the works.

7. TGS Confirmation and Approval

In the event a Traffic Guidance Scheme (TGS) is required, the lead contractor is to design and set out the TGS in accordance with Issue 6.0 of the Traffic control at work sites Technical Manual, November 2020 (TCAWS).

It is noted that any changes to the existing parking restrictions will require a minimum fourteen (14) days notification to adjoining property owners prior to the implementation of any temporary traffic control measures.

Any revisions or additional TGSs ones must be prepared by a PWZTMP qualified person upon engagement of the traffic management contractor and prior to commence of works on site.

7.1 TGS Verification

The concept TGSs prepared are based on the TCAWS TGS D.4.7 and TCP 77¹. Site confirmation must be undertaken via the completion of the TGS verification.

A TGS verification must be undertaken to confirm the selected or designed TGS is fit for purpose. A TGS verification must be completed in accordance with Section 8.1.2 TGS verification by an ITCP or PWZTMP qualified person. TGS verification must include an inspection of the work site where the TGS will be implemented.

7.2 TGS Approval

The PWZTMP qualified person who has designed or modified the relevant TGS has approved the TGS for use. Approval of the TGS includes:

- Review of the relevant TMP, risk assessment and associated TTM specific documentation;
- Design, redesign or modification of the TGS must be in accordance with the requirements of TCAWS;
- Confirmation that the TGS provides the relevant information for the ITCP person to safely implement on-site.

The one up manager of the PWZTMP qualified person has approved the TGS, including:

- Any non-standard or unaccepted signs or devices;
- Any departures from the requirements of TCAWS;
- If a manual traffic controller is proposed for use.

¹ Naming of TCP as per TCAWS Version 5

8. Summary

This CTMP has been prepared for the construction activities associated with the construction of the TAFE NSW IATC at 2-44 O'Connell Street, Kingwood. This report outlines the traffic process associated with the construction work, as well as the traffic management measures to improve and regulate the safety of pedestrians, cyclists, motorists, and works in the site vicinity.

It is envisaged that this document will be continually reviewed and amended if required, in the event of changes to design, the surrounding road network, or additional requirements of Council, or any other relevant authority.

Attachment 1 - Site Establishment Plan

ADCO SITE COMPOUND

Cultural artwork zone

Car Park Entry Gate 1

Contractor parking hardstand
2,219.473 sq m

Prefab workzone

Material hoist

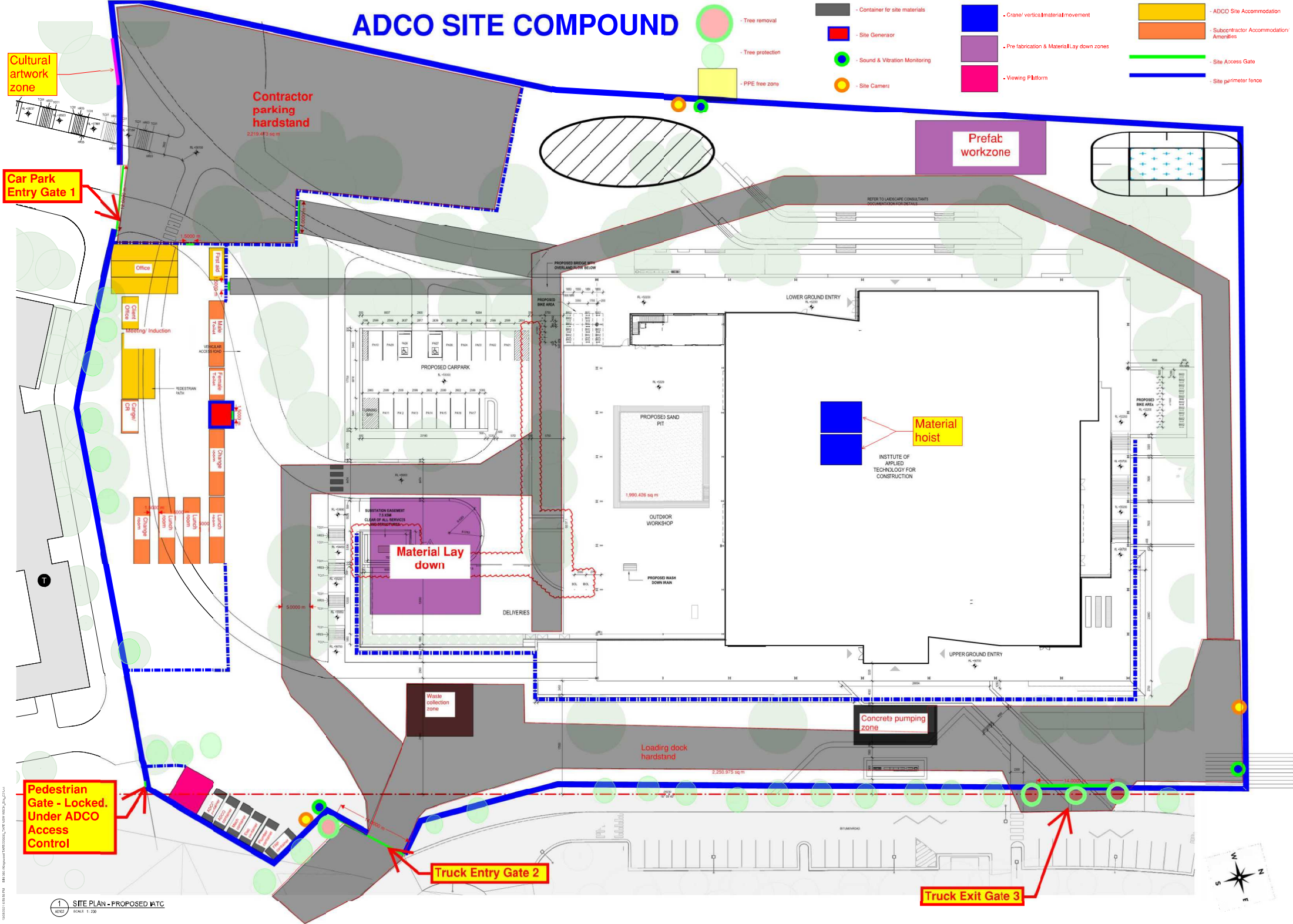
Material Lay down

Pedestrian Gate - Locked. Under ADCO Access Control

Truck Entry Gate 2

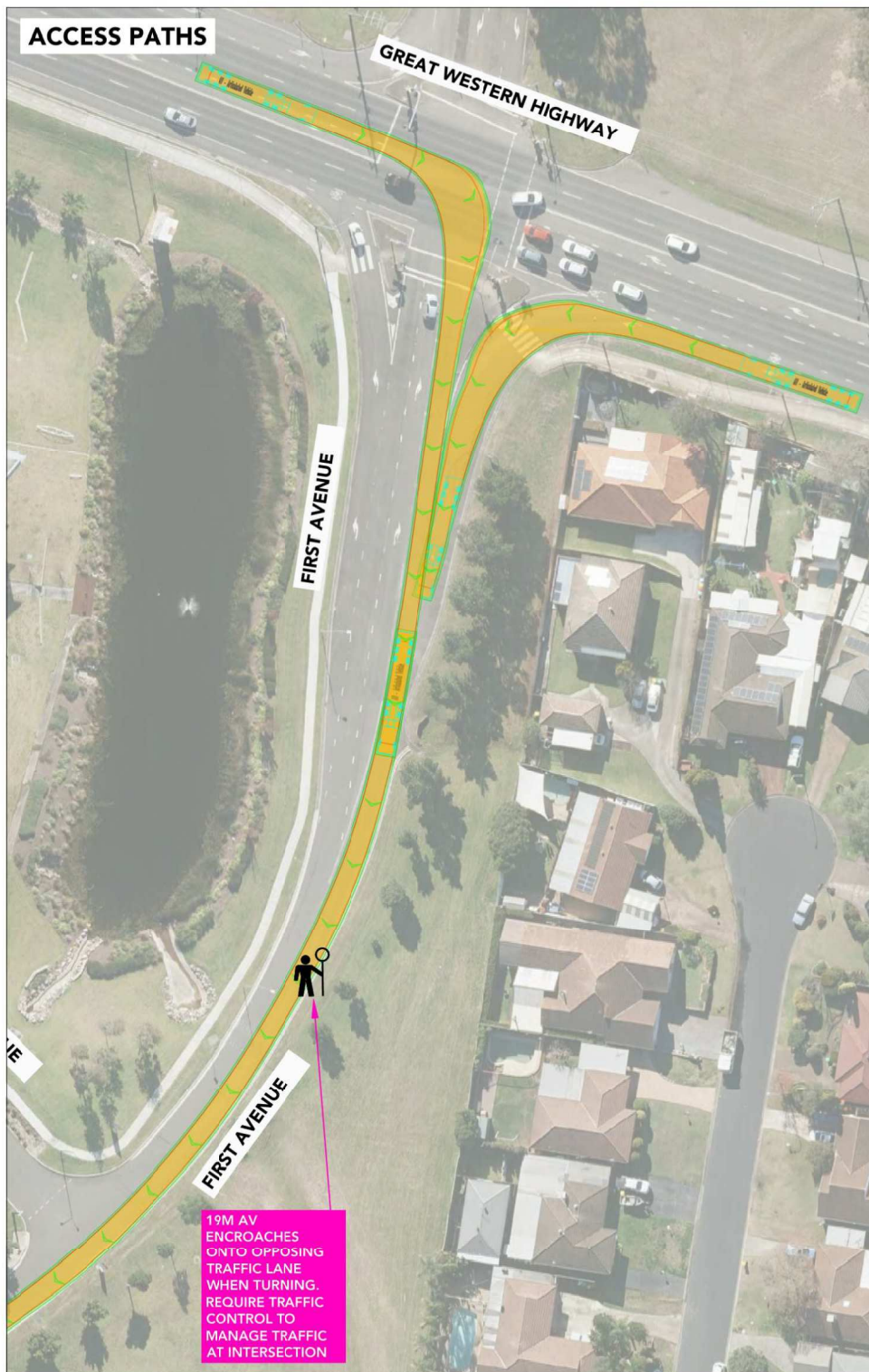
Truck Exit Gate 3

- Container for site materials
- Site Generator
- Sound & Vibration Monitoring
- Site Camera
- Crane/vertical material movement
- Pre fabrication & Material Lay down zones
- Viewing Platform
- ADCO Site Accommodation
- Subcontractor Accommodation/ Amenities
- Site Access Gate
- Site perimeter fence

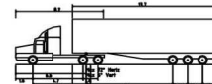
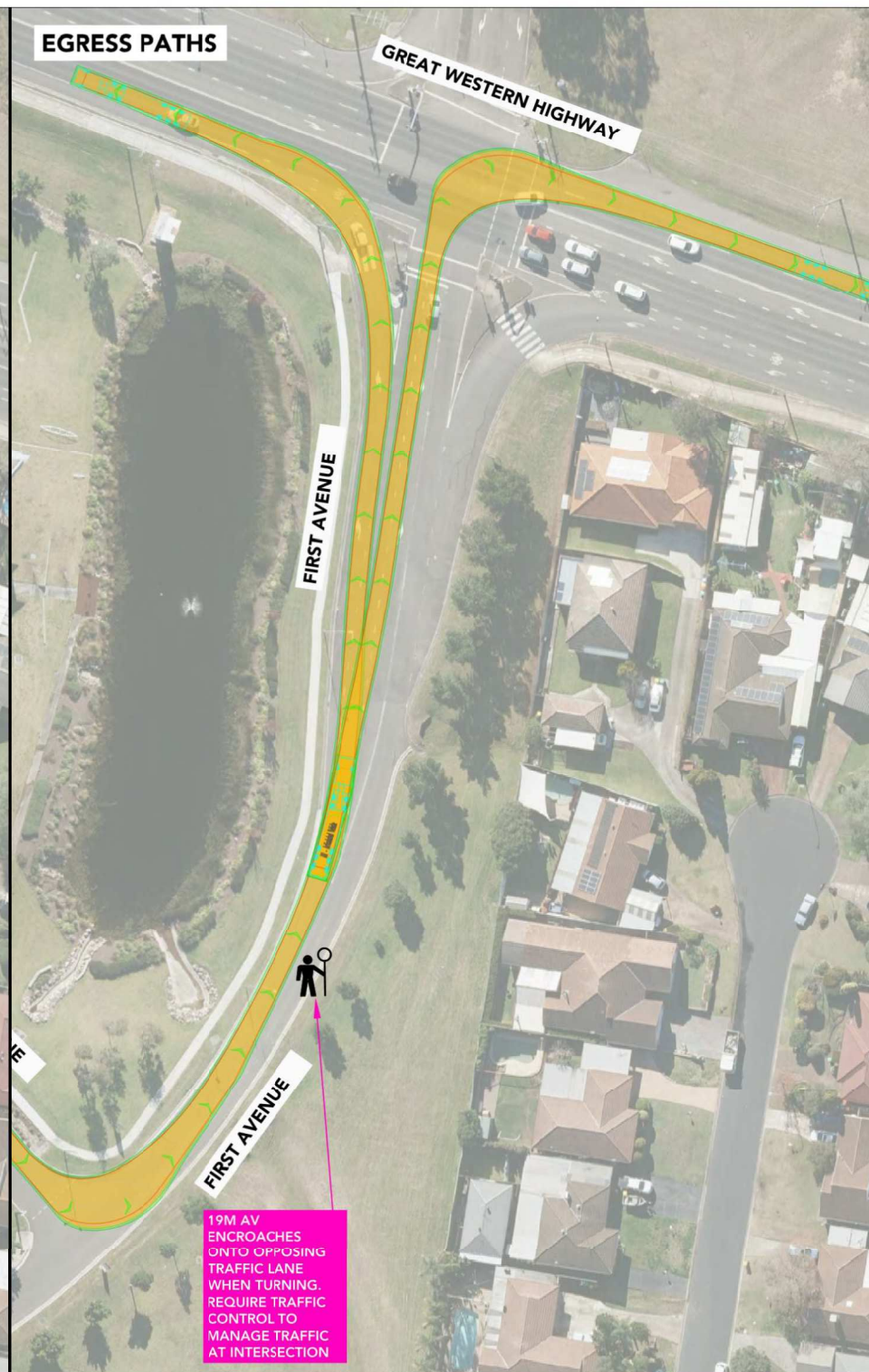


Attachment 2 - Swept Path Analysis (ptc.)

ACCESS PATHS



EGRESS PATHS



AV - Articulated Vehicle	19.00m
Overall Length	19.00m
Overall Width	2.50m
Min. Body Height	3.50m
Min. Body Ground Clearance	3.50m
Front Overlap	1.00m
Load to LGS Max	15.00m
LGS to LGS Turning Radius	15.00m

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
4	18/11/21	FOR COORDINATION	HL	SW
3	11/11/21	FOR COORDINATION	HLKY	SW
P2	06/11/21	FOR COORDINATION	HLKY	SW
P1	01/11/21	Option 1 Assessment	SW	SW

PROJECT
TAFE NSW CONSTRUCTION
CENTRE OF EXCELLENCE

DRAWING TITLE
Construction Access & Egress
Route 1
Sheet 1

DRAWING KEY

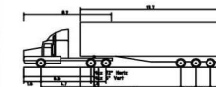
ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 9920 0800
ptcconsultants.co

CLIENT ADCO
DRAWING # R1-001
PROJECT # 21-5511
SCALE 1:750 @ A3



PRELIMINARY

REV P4



AV - Articulated Vehicle	
Overall Length	20.00m
Overall Height	4.00m
Overall Width	2.50m
Min. Road Clearance	4.50m
Front Overlap	1.00m
LWB to LWB Turning Radius	12.00m

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
4	18/11/21	FOR COORDINATION	HL	SW
3	11/11/21	FOR COORDINATION	HLXY	SW
P2	08/11/21	FOR COORDINATION	HLXY	SW
P1	01/11/21	Option 1 Assessment	SW	SW

PROJECT
TAFE NSW CONSTRUCTION
CENTRE OF EXCELLENCE

DRAWING TITLE
Construction Access
Route 1
Sheet 2

DRAWING KEY

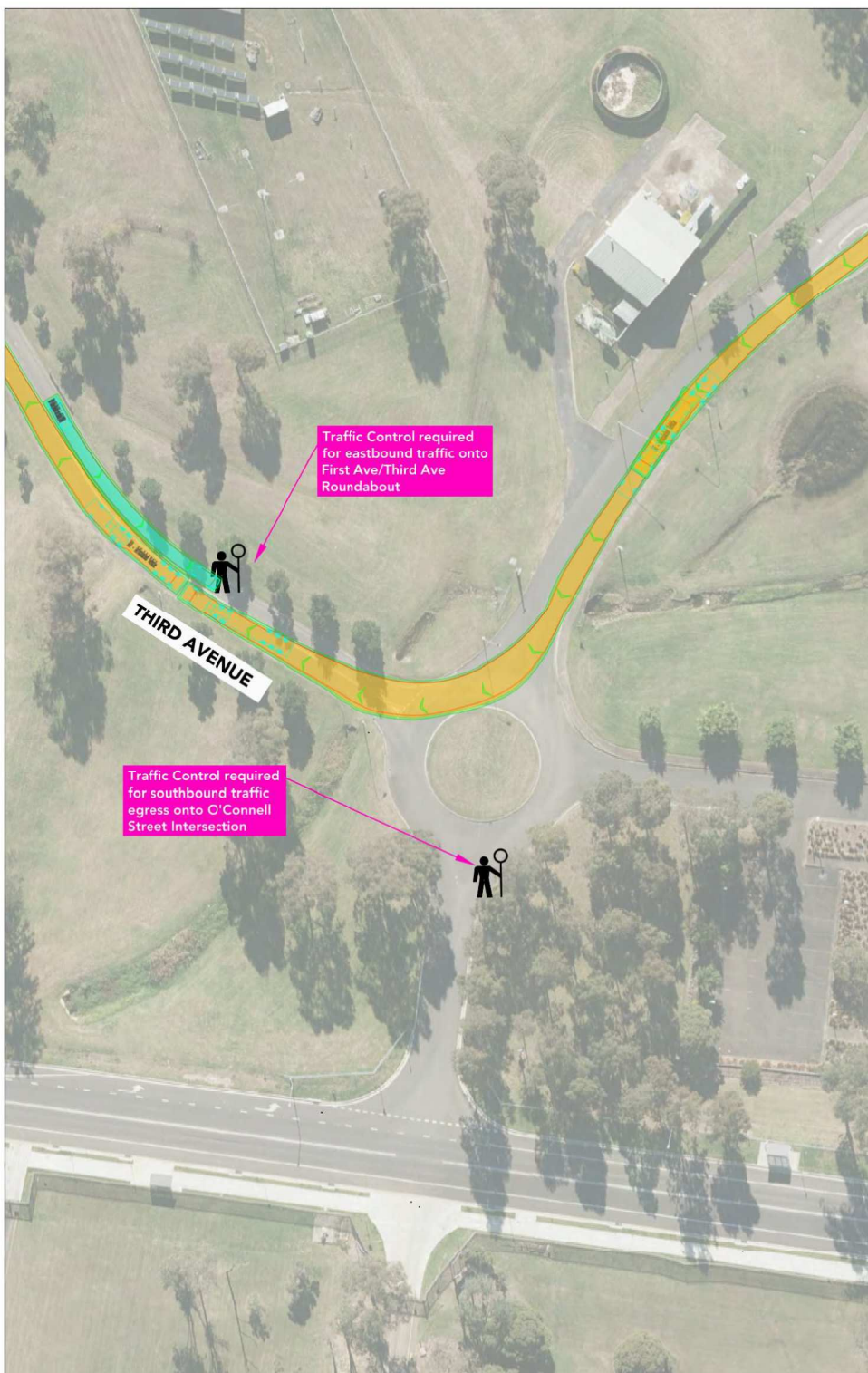
ptc. Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 9920 0800
ptcconsultants.co

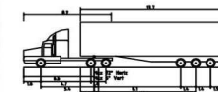
CLIENT ADCO
DRAWING # R1-002
PROJECT # 21-5511
SCALE 1:750 @ A3



FRELIMINARY

REV P4





AV - Articulated Vehicle	20.00m
Overall Length	20.00m
Overall Height	4.00m
Overall Width	2.50m
Wheelbase	12.00m
Turning Radius	12.00m

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
A4	18/11/21	FOR COORDINATION	HL	SW
A3	11/11/21	FOR COORDINATION	HLKY	SW
P2	06/11/21	FOR COORDINATION	HLKY	SW
P1	01/11/21	Option 1 Assessment	SW	SW

PROJECT
TAFE NSW CONSTRUCTION
CENTRE OF EXCELLENCE

DRAWING TITLE
Construction Access & Egress
Option 1
Sheet 3

DRAWING KEY

ptc. Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 9920 0800
ptcconsultants.co

CLIENT	ADCO
DRAWING #	R1-003
PROJECT #	21-5511
SCALE	1 : 750 @ A3

PRELIMINARY

REV P4

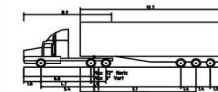
19M AV REQUIRES ENTIRE
ROADWAY BETWEEN
WORKS ZONE AND KING
STREET/FOURTH AVENUE
ROUNDBOUT. REQUIRE
TRAFFIC CONTROL TO
MANAGE TRAFFIC AT
INTERSECTION &
MONITOR PARKING

WORKS ZONE

KING STREET

FOURTH AVENUE

19M AV REQUIRES
ENTIRE ROADWAY
BETWEEN WORKS ZONE
AND KING
STREET/FOURTH AVENUE
ROUNDBOUT. REQUIRE
TRAFFIC CONTROL TO
MANAGE TRAFFIC AT
INTERSECTION



AV - Articulated Vehicle	20.00m
Overall Length	2.50m
Overall Width	4.00m
Overall Height	12.00m
Wheel Base	0.25m
Minimum Ground Clearance	12.00m
Front Overhang	12.00m
Back Overhang	12.00m
Turn to Left	12.00m
Turn to Right	12.00m

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
4	18/11/21	FOR COORDINATION	HL	SW
3	11/11/21	FOR COORDINATION	HL	SW
P2	08/11/21	FOR COORDINATION	HL	SW
P1	01/11/21	Option 1 Assessment	SW	SW

PROJECT
TAFE NSW CONSTRUCTION
CENTRE OF EXCELLENCE

DRAWING TITLE
Construction Access & Egress
Route 1
Sheet 4

DRAWING KEY

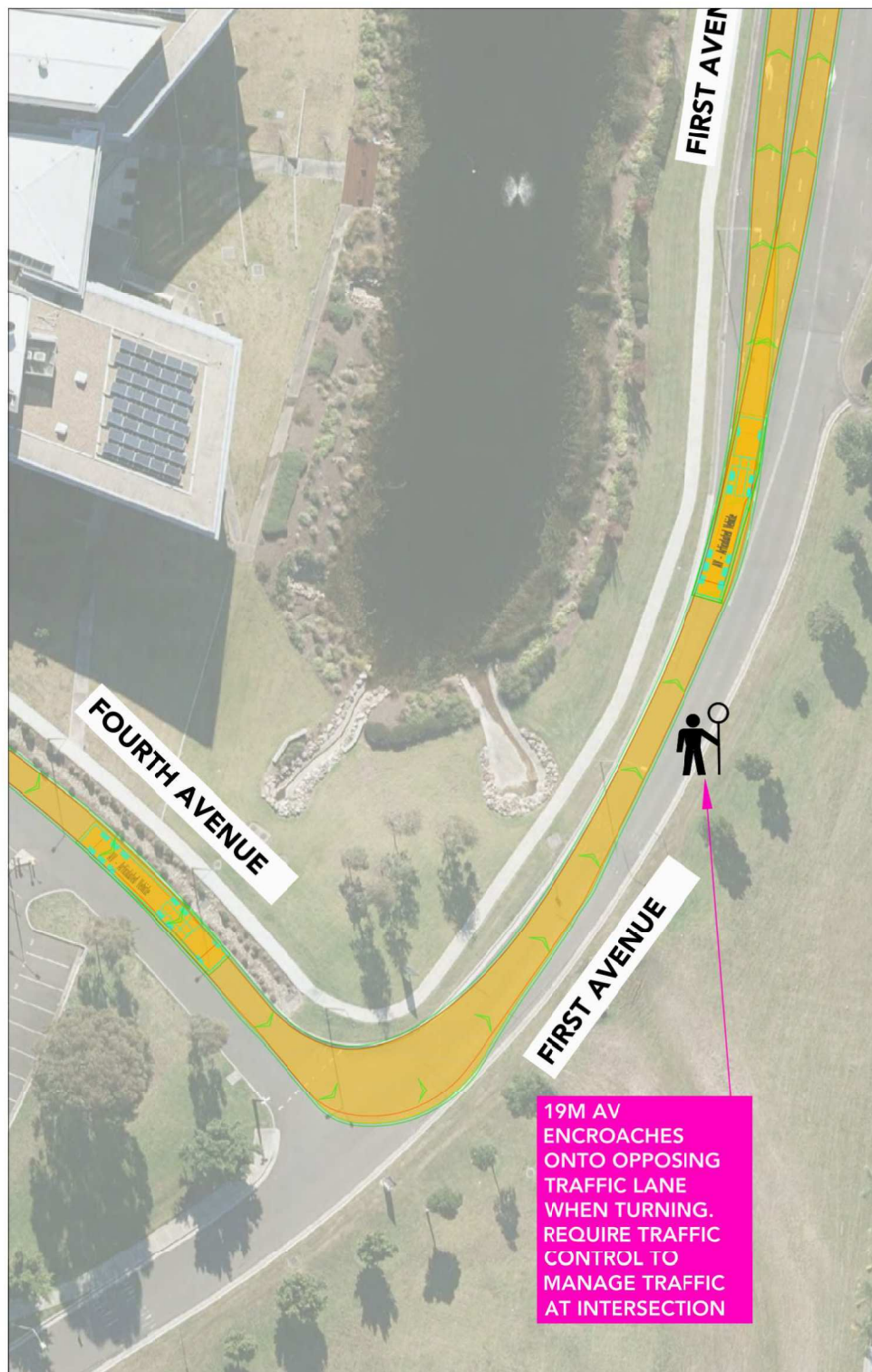
ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 9920 0800
pticonsultants.co

CLIENT ADCO
DRAWING # OPT1-004
PROJECT # 21-5517
SCALE 1 : 500 @ A3

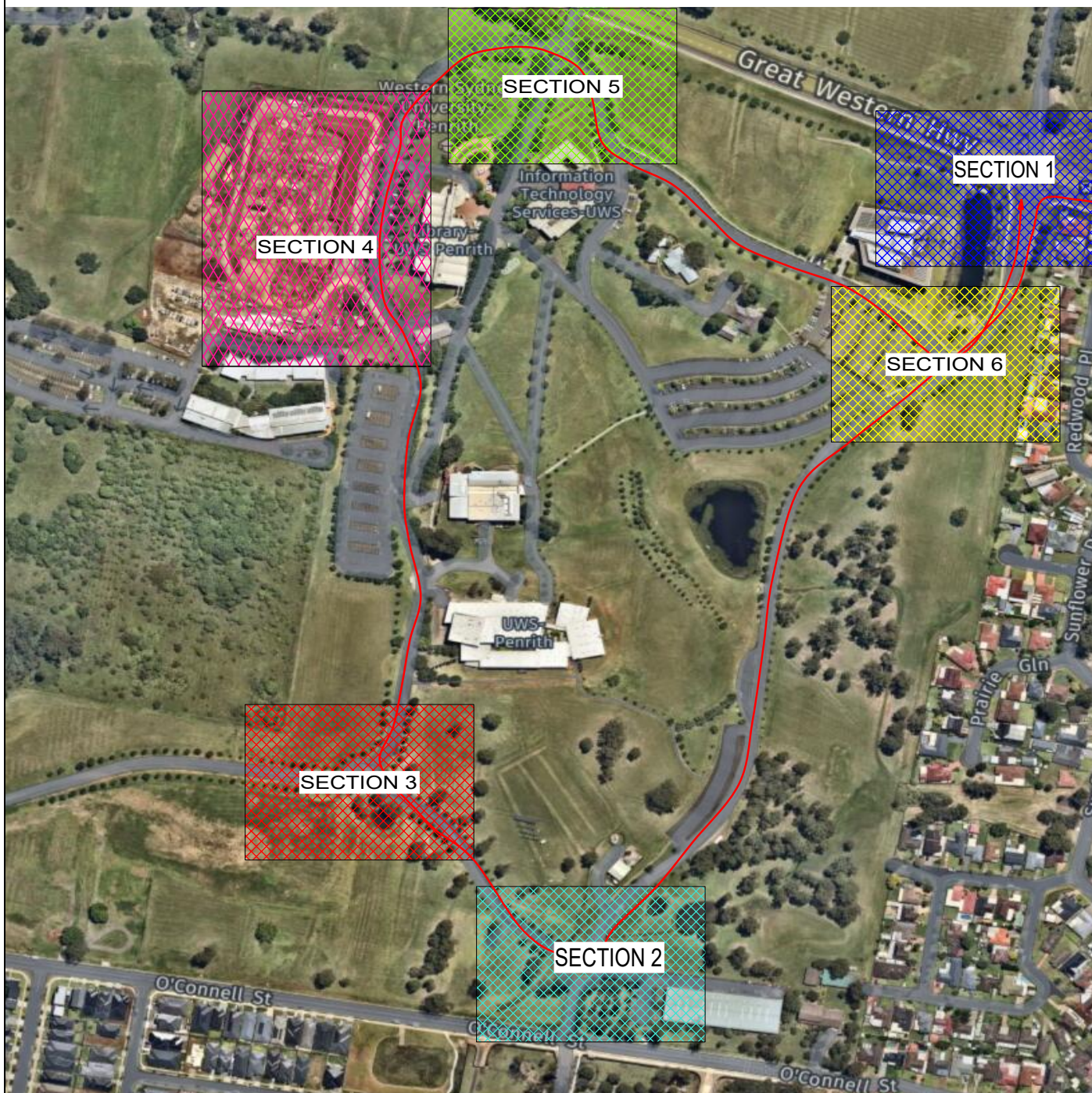


PRELIMINARY

REV P4



Attachment 3 - Traffic Guidance Schemes (TGS) Escort Vehicle



THE FOLLOW PLANS INDICATE THE ACCESS FOR SITE DELIVERY VEHICLES ENTERING AND EXITING VIA THE GREAT WESTERN HIGHWAY INTERSECTION.

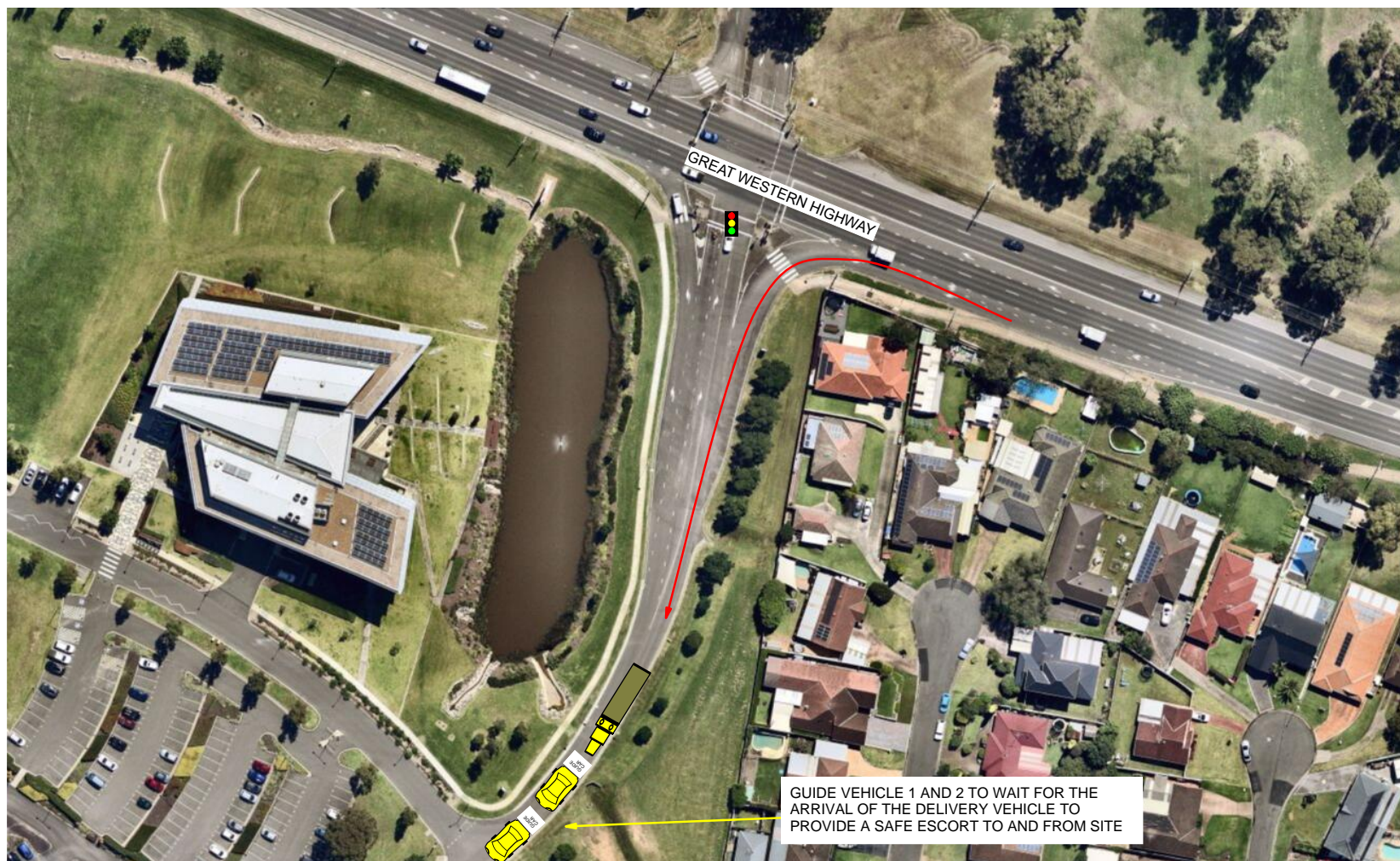
EACH SECTION DISPLAYS THE LOCATION OF GUIDE VEHICLES TO SAFELY HOLD TRAFFIC AND ALLOW THE MOVEMENT OF SITE DELIVERY VEHICLES.


TWO RADIO COMMUNICATION MUST BE MAINTAINED AT ALL TIMES BETWEEN PILOT VEHICLES OPERATORS AND DELIVERY VEHICLES OPERATORS

UNIVERSITY GROUNDS SPEED LIMIT AND RULES MUST BE OBEYED AT ALL TIMES

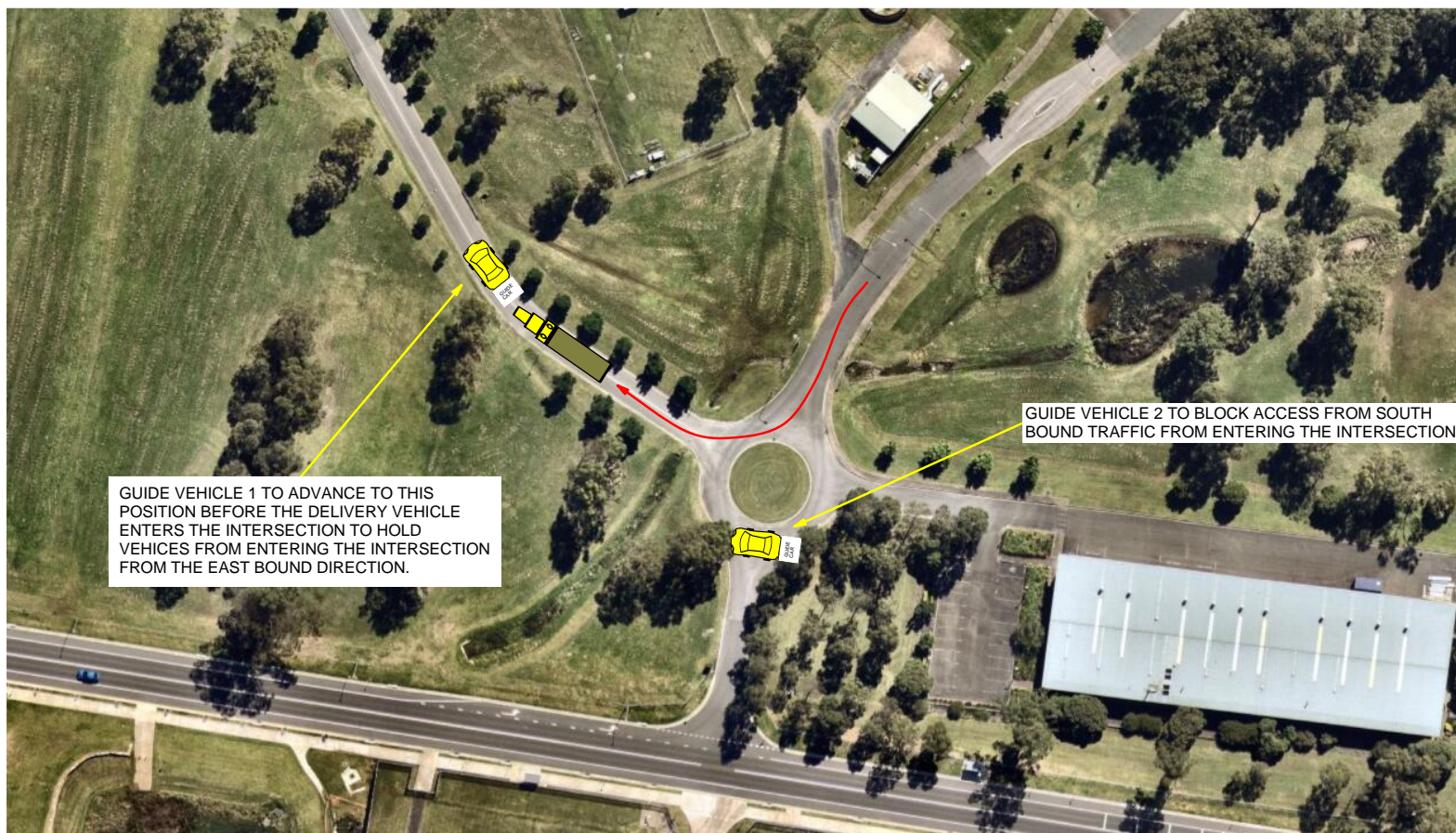
AMBER FLASHING LIGHTS AND/OR AMBER INDICATORS MUST BE ACTIVATED AT ALL TIMES


ONLY OPERATORS WITH A NSW DRIVERS LICENSE ARE TO BE IN CONTROL OF ANY VEHICLE WHILST ONSITE



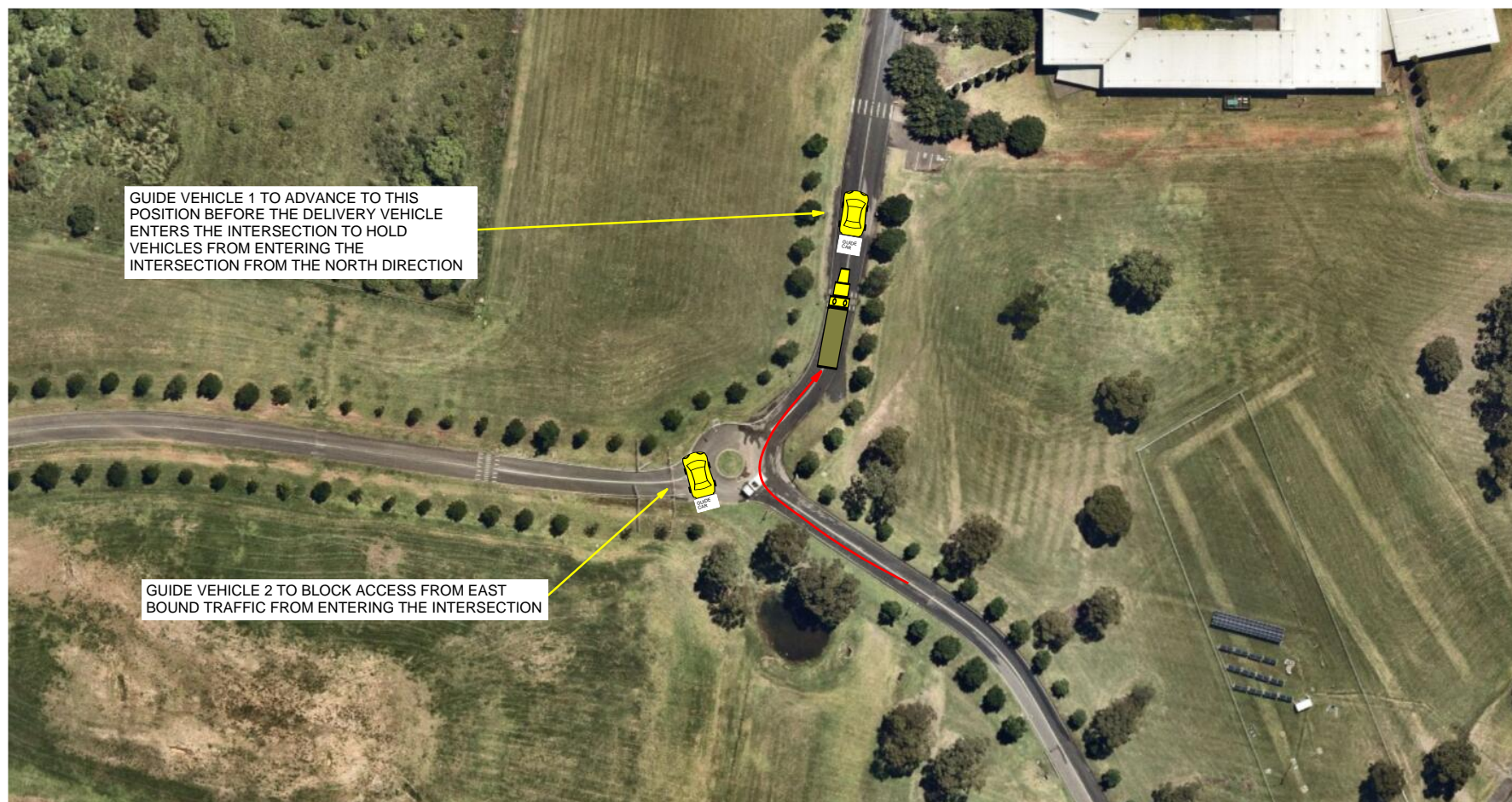
	Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS Comments:	Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)	Manifest
	VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY		2 x guide vehicle 1 x traffic light 1 x tray truck


SECTION 1



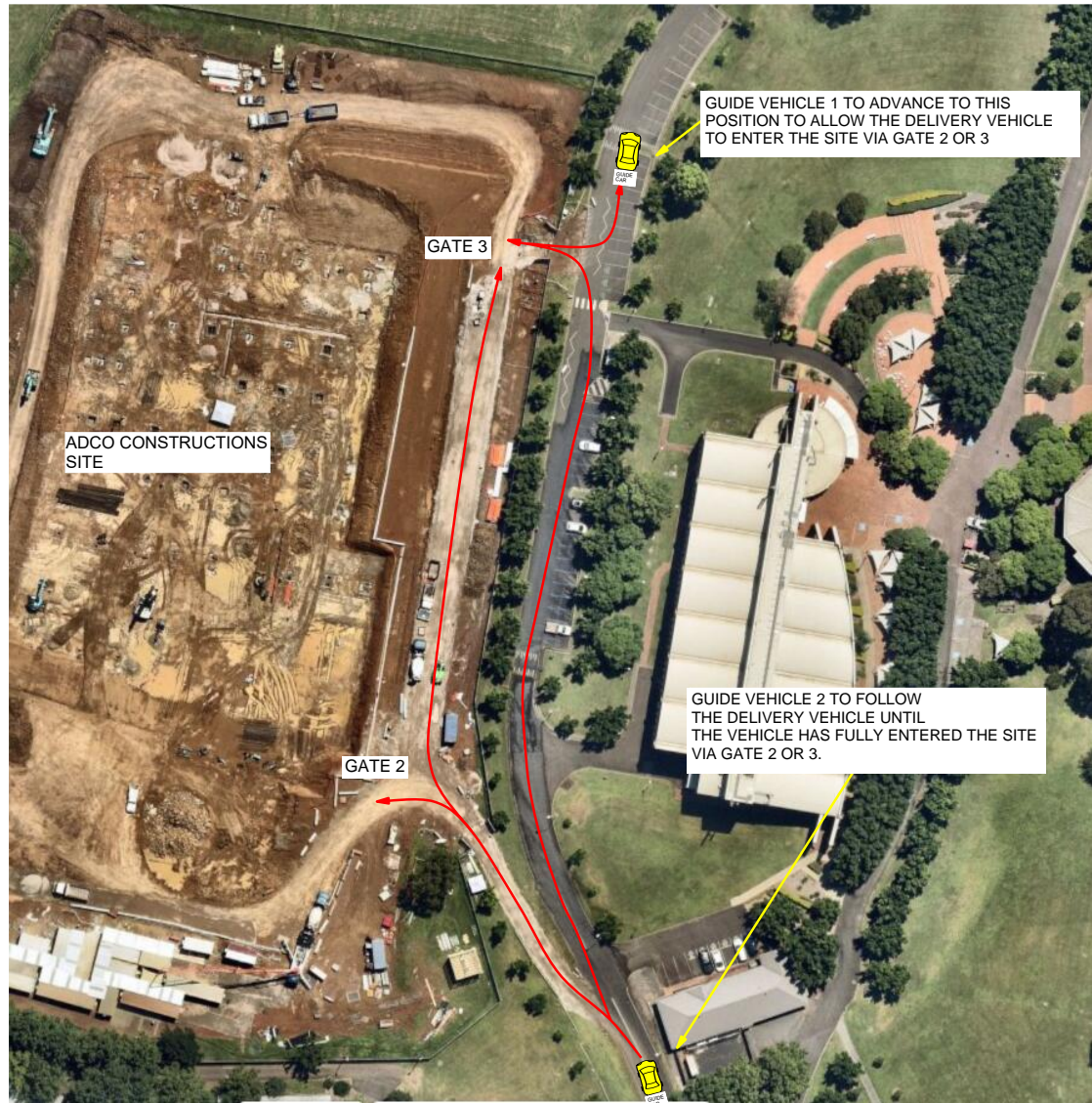
	Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS	Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)	Manifest
	Comments: VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY		2 x guide vehicle 1 x tray truck


SECTION 2



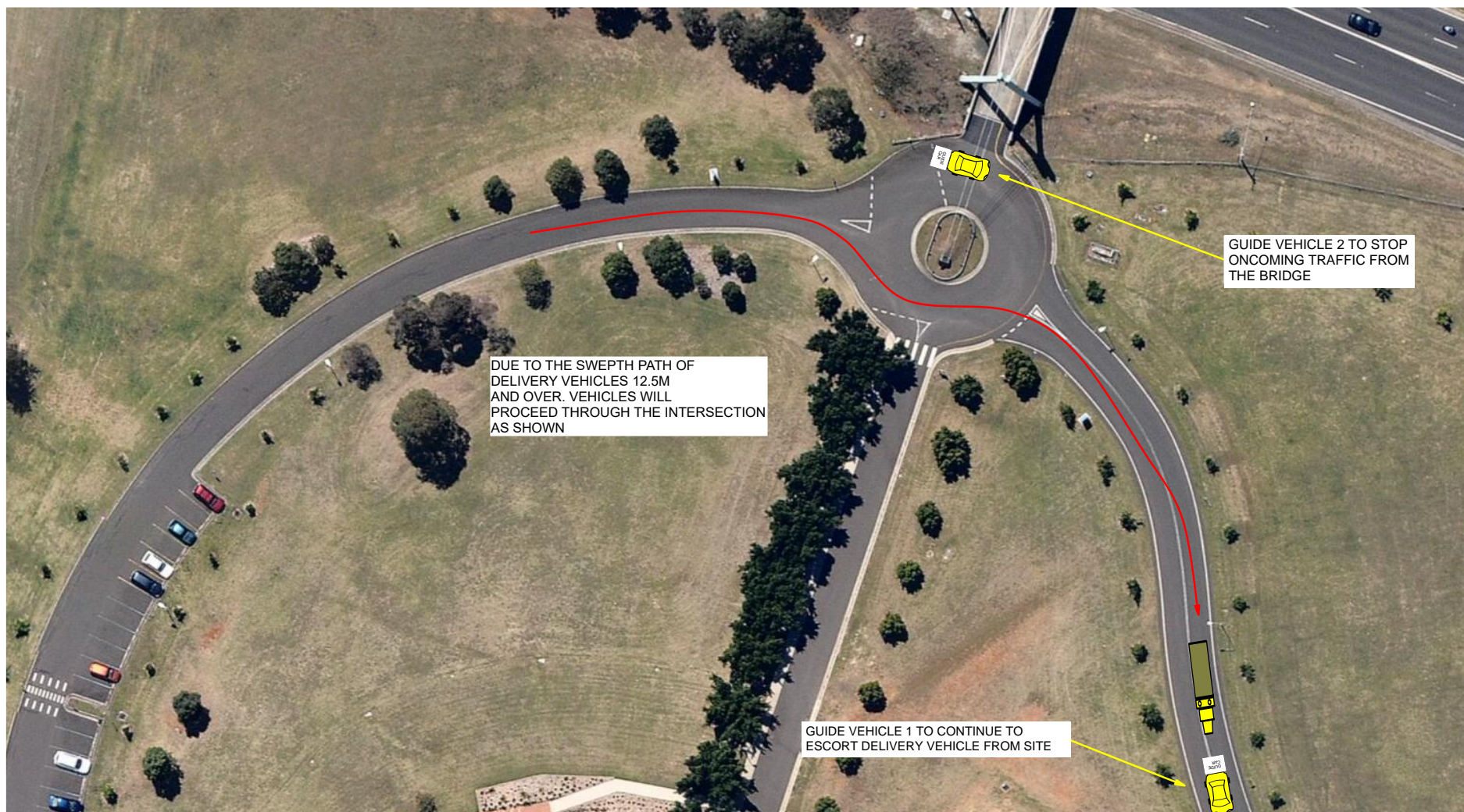
	Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS Comments:	Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)	Manifest
	VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY ▲		2 x guide vehicle 1 x tray truck


SECTION 3



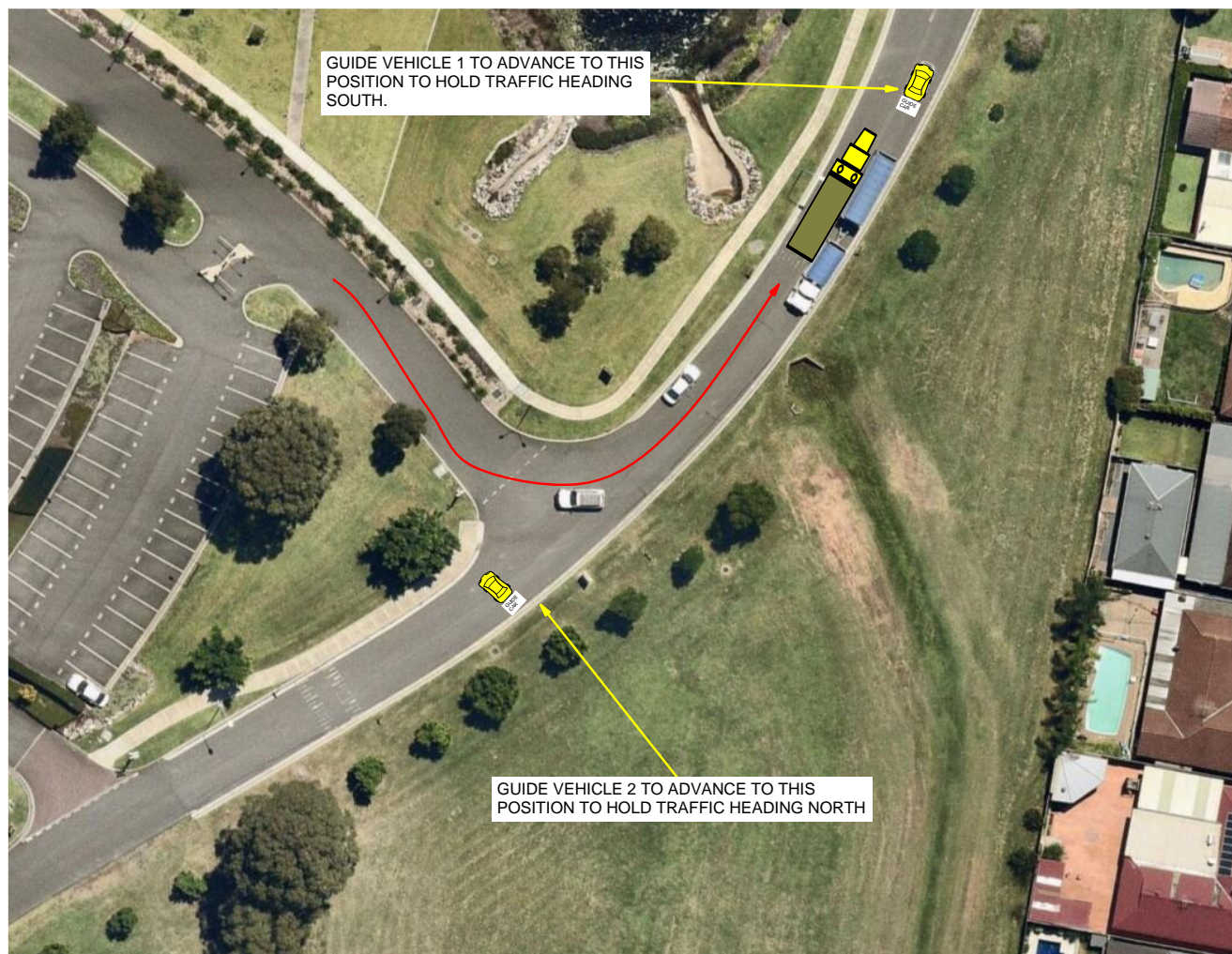
	<p>Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS</p> <p>Comments: VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY</p>	<p>Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)</p>	<p>Manifest</p> <p>2 x guide vehicle</p>

SECTION 4



	<p>Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS</p> <p>Comments: VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY</p>	<p>Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)</p>	<p>Manifest</p> <p>2 x guide vehicle 1 x tray truck</p>
---	--	--	--

SECTION 5



JARRAH

Date: 19/04/2022 **Author:** Steven Spiteri 2452057913 **Project:** ADCO CONSTRUCTIONS

Comments:
VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES
AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY

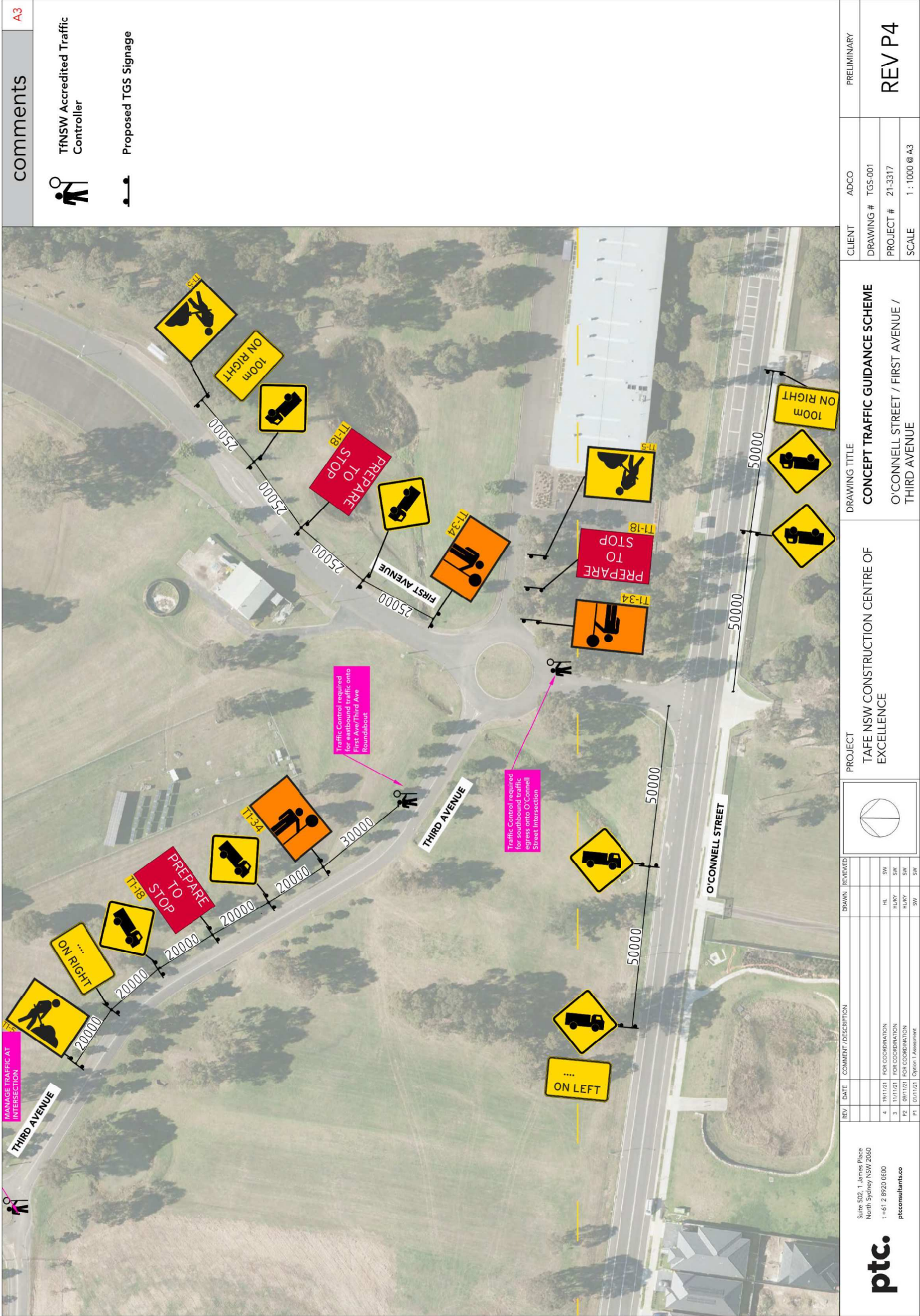
Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)

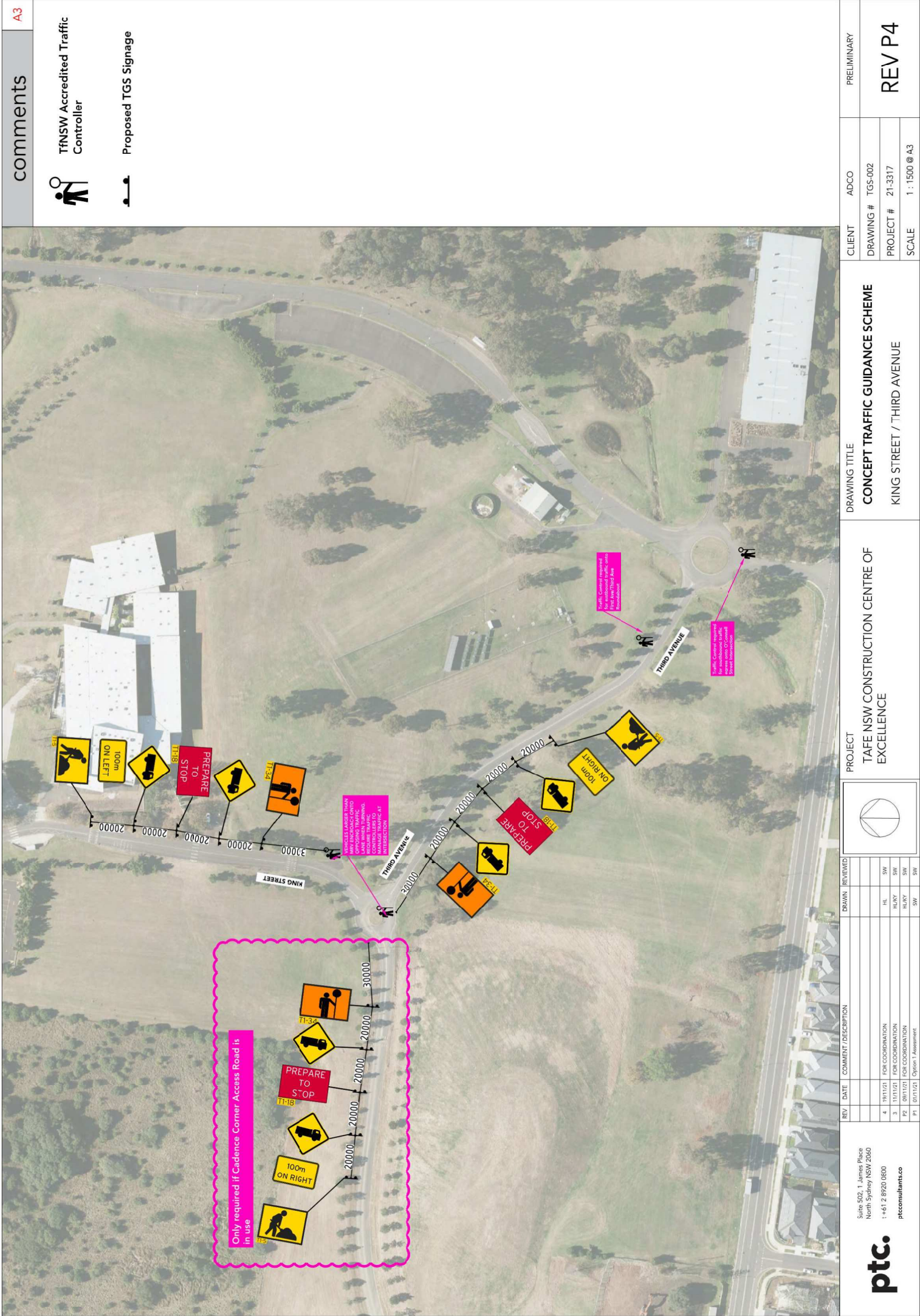
Manifest

2 x guide vehicle
1 x tray truck

SECTION 6

Attachment 4 - Traffic Guidance Scheme (TGS) Traffic Controllers (Used on Heavy Vehicle movement days)

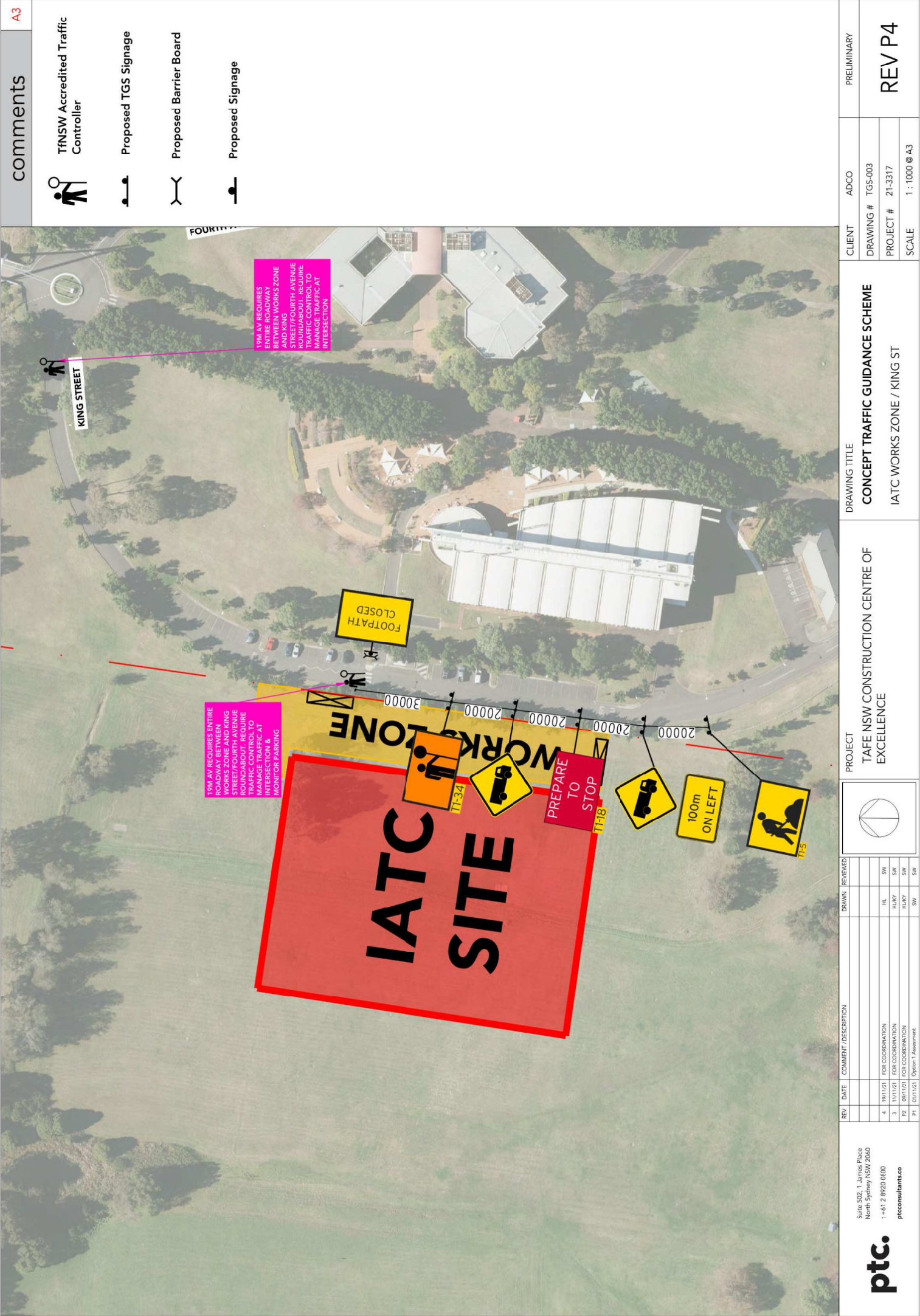




comments		A3
	TfNSW Accredited Traffic Controller	
	Proposed TGS Signage	

DRAWING TITLE		CLIENT	ADCO	PRELIMINARY
PROJECT TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE KING STREET / THIRD AVENUE		DRAWING #	TGS-002	
		PROJECT #	21-3317	
		SCALE	1 : 1500 @ A3	
		REV P4		

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
4	19/11/21	FOR COORDINATION	HL	SW
3	11/11/21	FOR COORDINATION	HLKY	SW
2	09/11/21	FOR COORDINATION	HLKY	SW
1	07/11/21	Option 1 Assessment	SW	SW



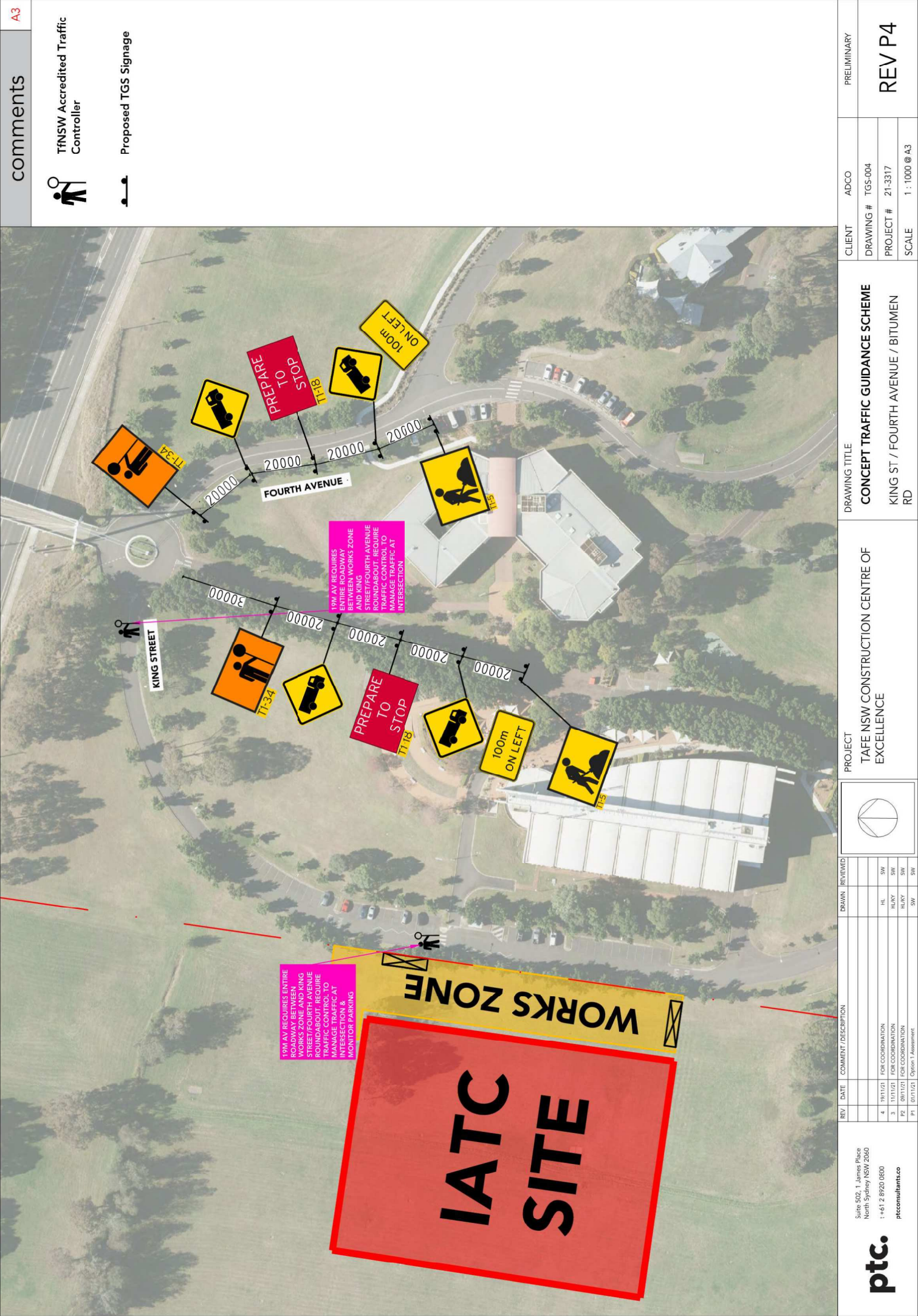
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4	19/11/21	FOR COORDINATION	HL	SW
3	11/11/21	FOR COORDINATION	HLKY	SW
P2	09/11/21	FOR COORDINATION	HLKY	SW
P1	07/11/21	Option 1 Assessment	SW	SW



PROJECT
TAFE NSW CONSTRUCTION CENTRE OF
EXCELLENCE

DRAWING TITLE
CONCEPT TRAFFIC GUIDANCE SCHEME
IATC WORKS ZONE / KING ST

CLIENT	ADCO	PRELIMINARY
DRAWING #	TGS-003	
PROJECT #	21-3317	
SCALE	1 : 1000 @ A3	



comments

A3



TfNSW Accredited Traffic Controller



Proposed TGS Signage

 Suite 502, 1 James Place North Sydney NSW 2060 t+61 2 8920 0800 pticonsultants.co	REV		DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED	PROJECT		DRAWING TITLE		CLIENT	ADCO	PRELIMINARY
	4	19/11/21		FOR COORDINATION			TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE		CONCEPT TRAFFIC GUIDANCE SCHEME		DRAWING #	TGS-004	
	3	11/11/21		FOR COORDINATION			KING ST / FOURTH AVENUE / BITUMEN RD				PROJECT #	21-3317	
	P1	09/11/21		FOR COORDINATION							SCALE	1 : 1000 @ A3	REV P4
					P1	07/11/21	Option 1 Assessment						



comments

A3

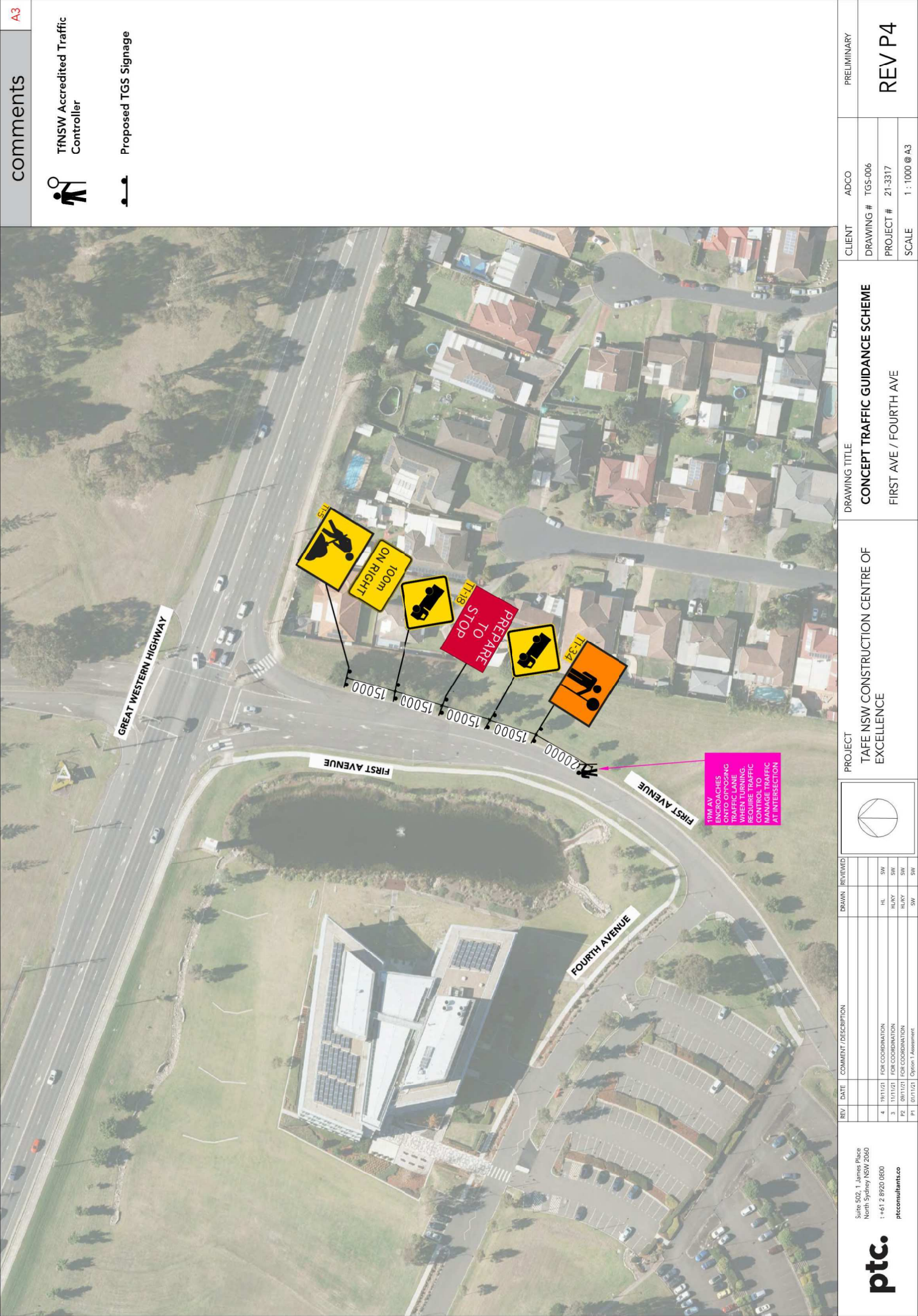


TfNSW Accredited Traffic Controller



Proposed TGS Signage

Suite 502, 1 James Place North Sydney NSW 2060 1+461 2 8920 0800 pticonsultants.co	REV		DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED	PROJECT		DRAWING TITLE		CLIENT	ADCO	PRELIMINARY
	4	19/11/21	FOR COORDINATION				TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE		CONCEPT TRAFFIC GUIDANCE SCHEME		DRAWING #	TGS-005	
	3	11/11/21	FOR COORDINATION				KING ST / FOURTH AVENUE / SECOND AVE				PROJECT #	21-3317	
	P1	07/11/21	Option 1 Assessment								SCALE	1 : 1000 @ A3	REV P4



comments

A3



TfNSW Accredited Traffic Controller



Proposed TGS Signage

<div><p>ptc.</p><p>Suite 502, 1 James Place North Sydney NSW 2060 1 +61 2 8920 0800 pticonsultants.co</p></div>	REV		DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED	PROJECT		DRAWING TITLE		CLIENT		PRELIMINARY	
	4	19/11/21	FOR COORDINATION		HL	SW	<div><p>TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE</p><p>FIRST AVE / FOURTH AVE</p></div>		<p>CONCEPT TRAFFIC GUIDANCE SCHEME</p>		ADCO		DRAWING # TGS-006	
	3	11/11/21	FOR COORDINATION		HL	SW								
	P2	09/11/21	FOR COORDINATION		HL	SW								
		P1	07/11/21	Option 1 Assessment		SW							PROJECT # 21-3317	
												SCALE 1 : 1000 @ A3		REV P4

Attachment 5- Driver Code of Conduct

Other Considerations

- **Speed Limits** – All heavy vehicle drivers are to obey the posted speed limits, within or outside of the construction site. Keep in mind that there are changes in traffic conditions and altered speed limits are posted on approach to the site;
- **Driver Fatigue** – Driver fatigue is a road safety hazard and one of the biggest causes of accidents especially for heavy vehicle drivers. All drivers have a duty to not drive a vehicle while impaired by fatigue.
- **Covering Loads** – TfNSW requires all load covers to secure and contain all materials within the vehicle and trailer;
- **Heavy Vehicle Interval** – To increase road safety, heavy vehicles leaving the construction site should be separated, as far as practicable, a minimum of a 10-minute interval;
- **Vehicle Breakdowns** – In the case of a breakdown, the vehicle must be towed to the nearest breakdown point as soon as possible and reported to the Service NSW Transport Management Centre (131 700).
- **Site Access** – Vehicles shall enter and exit the site in a forward direction.
- **Drugs and Alcohol** – Drivers must not be under the influence of any illicit drugs, alcohol or medication which may impair their ability to operate a vehicle. Drivers will be randomly tested for drugs and alcohol.

Hours of Work

All work associated with the project will be restricted to the permitted working hours as defined in the CTMP:

Monday to Friday	7:00am to 6:00pm
Saturday	7:00am to 5:00pm
Sunday/Public Holiday	No works

Emergency Contact Numbers

Service NSW Transport Management Centre
131 700

Penrith City Council
(02) 4732 7777

ADCO Constructions Project Manager
Pierce Brennan
0419 422 566

ADCO Constructions Sydney
02 8437 5000

All other Emergencies
000



TAFE NSW
Institute of Applied Technology
for Construction (IATC)
Nepean Kingswood Campus

Driver Code of Conduct

This Driver Code of Conduct applies to all personnel and any other person conducting business for the TAFE NSW IATC whether a direct employee of ADCO Constructions or employed by some other organisation providing service or working with ADCO Constructions.

General Requirements

- As a driver you are required to know and comply with all the road rules pertaining to your vehicle;
- You are expected to hold a valid driver's licence for the class of the vehicle you are operating;
- Undertake a site induction carried out by an approved member of the construction staff or suitably qualified person;
- Participate in regular toolbox meetings with appropriate and qualified person;
- Promote road safety and obey all NSW Road Rules; and
- You are to operate the vehicle in a safe manner within and outside the construction site and comply with the direction of authorised site personnel while inside the site.

Truck Routes

Heavy vehicle drivers are to carefully plan their routes so that state and regional roads are given priority for route selection, keeping in mind the certain restrictions during particular times of the day.



-  TAFE NSW Nepean Kingswood Campus Boundary
-  IATC Site
-  Proposed Works Zone
-  Access Route
-  Egress Route

Attachment 6 - TAFE NSW / WSU Access Deed Management Plan (ADCO)

PEOPLE WHO BUILD



TRAFFIC MANAGEMENT PLAN

INCL WESTERN SYDNEY UNIVERSITY ACCESS DEED COMPLIANCE

PROJECT NAME:
TAFE NSW IATC

DATE:
10/08/22

REVISION:
05

TRAFFIC MANAGEMENT PLAN- WSU SPECIFIC



VERSION CONTROL

Rev. No.	Issue Date	Approved By	Position	Details
01	29/11/21	Pierce Brennan	Project Manager	Preliminary Issue
02	20/04/22	Kieran Hill	Project Engineer	Contract Award Issue
03	02/05/22	George Awad	Project Engineer	Introduction of Guide Vehicles
04	17/05/22	George Awad	Project Engineer	Initial Feedback
05	10/08/22	Pierce Brennan	Project manager	General Review and Update Personnel

ADCO PROJECT PERSONNEL CONSULTATION AND SIGN OFF

We, the undersigned, confirm that we have been consulted on the contents of this document providing opportunity for input. The undersigned is to confirm that I have read and understood the contents of this document and agree to implement the requirements of this Plan on this project site.

Note: acknowledgment can also be confirmed through a toolbox meeting documented through Hammertech.

Name	Position	Acknowledgment
Simon Brown	Site Manager	
George Baliotis	Site Foreman	
Rob Torchia	Site Foreman	
Kieran Hill	Project Engineer	
Matthew Olszewski	Project Engineer	
George Awad	Project Engineer	

DOCUMENT TITLE	TRAFFIC MANAGEMENT PLAN
DATE OF THIS REVISION	10 AUGUST 2022
PAGE	2 of 21

TRAFFIC MANAGEMENT PLAN- WSU SPECIFIC



Russell Eccles	HSE Advisor	
Andrew Roman	Services Manager	
Jed Nicholl	Senior Contract Administrator	
Rami Mehzer	Contract Administrator	
Nick Moldrich	Senior Design Manager	
Harrison Crouch	Cadet- CA	
Mark Zabica	Cadet- Engineer	
Tyler Barker	Construction Worker	
Nick Meagher	Construction Worker	
Darrell Price	Construction Worker	
Max Evans	Apprentice	
Dean Israel	Construction Manager	
Pierce Brennan	Project Manager	

DOCUMENT TITLE	TRAFFIC MANAGEMENT PLAN
DATE OF THIS REVISION	10 AUGUST 2022
PAGE	3 of 21

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4.0 INSURANCES	7
5.0 TRAFFIC MANAGEMENT- KEY CONSIDERATIONS	8
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7.0 MANAGEMENT AND GOVERNENCE	10
8.0 SUMMARY	12
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APPENDIX B ADCO SITE COMPOUND	
APPENDIX C TRAFFIC GUIDANCE SCHEME	
APPENDIX D GUIDE VEHICLE CONTROL PLAN.....	
APPENDIX F DRIVER CODE OF CONDUCT	
APPENDIX FF GEOTECHNICAL REPORT	

DOCUMENT TITLE	TRAFFIC MANAGEMENT PLAN
DATE OF THIS REVISION	10 AUGUST 2022
PAGE	4 of 21

1.0 PROJECT INFORMATION

The NSW IATC building will facilitate an active learning environment collocating building, construction, engineering, and manufacturing disciplines. Students will have access to state-of-the-art facilities and technology that is flexible and adaptable to industry needs. The building will connect students and staff with industry partners and will provide flexible space for training purposes to simulate real world scenarios and environments, exhibition and function space and shared workspace.

The TAFE NSW IACT includes the Design Finalisation and Construction of the following:

/ External Works

- ✓ 18 bay Carpark, includes two accessible and one electric vehicle park
- ✓ Loading Dock and Laybacks
- ✓ Gate 2 Entrance Works & miscellaneous driveway upgrades
- ✓ Landscaping
- ✓ Services Trenching and Connections
- ✓ Footpaths and Driveways

/ Lower Ground Floor

- ✓ Outdoor workshop Area & Sandpit
- ✓ Multi Trades Workshops
- ✓ Technical Labs
- ✓ Carpentry Machine Room
- ✓ General Learning spaces
- ✓ General Materials and Tool Storage Area
- ✓ Staff/Student Amenities incl End of Trip
- ✓ Upper Ground Floor

/ Upper Ground Floor

- ✓ General Learning Spaces
- ✓ Trade Workshop Spaces
- ✓ Staff/Student Amenities
- ✓ Industry Engagement Space
- ✓ Seminar Rooms
- ✓ Café

/ Level 1 Public domain elements

- ✓ General Learning Spaces
- ✓ Auditorium
- ✓ Plant Room
- ✓ Staff/Student Amenities
- ✓ Industry Engagement Space
- ✓ Staff Workspaces

DOCUMENT TITLE	TRAFFIC MANAGEMENT PLAN
DATE OF THIS REVISION	10 AUGUST 2022
PAGE	5 of 21

TRAFFIC MANAGEMENT PLAN- WSU SPECIFIC



1.1 PROJECT ADDRESS AND STATE SIGNIFICANT DEVELOPMENT NUMBER

Project Description	Institute of Applied Technology for Construction (IATC)
Project Address	12-44 O'Connell St, Kingswood, NSW 2747
SSD Number	SSD-8571481

1.2 PRINCIPAL CONTRACTOR PROJECT PERSONNEL

A representative of ADCO will be onsite while there is works being undertaken on site. For any questions or issues that may arise over the course of the project, the below contact details can be contacted to discuss the questions and resolve the issue.

Name	Position	Phone Number	Email
Dean Israel	Construction Manager	0413 777 152	disrael@adcoconstruct.com.au
Pierce Brennan	Project Manager	0419 422 566	pbrennan@adcoconstruct.com.au
Simon Brown	Site Manager	0419 012 704	sbrown@adcoconstruct.com.au
Kieran Hill	Project Engineer	0439042092	khill@adcoconstruct.com.au
Rob Torchia	Site Foreman	0418 365052	rtorchia@adcoconstruct.com.au

1.3 PRINCIPAL CONTRACTORS HEAD OFFICE DETAILS

Name	State	Address	ABN
ADCO Constructions Pty Ltd	Address	Level 2, 7-9 West Street	46 001 044 391
	Suburb	North Sydney	
	State	New South Wales	
	Phone	02 8437 5000	

DOCUMENT TITLE	TRAFFIC MANAGEMENT PLAN
DATE OF THIS REVISION	10 AUGUST 2022
PAGE	6 of 21

TRAFFIC MANAGEMENT PLAN- WSU SPECIFIC



2.0 ACCESS LICENCE AGREEMENT

TAFE NSW has entered into an Access Deed (Deed) agreement with Western Sydney University (WSU) which facilitates construction traffic access on WSU Werrington campus road network associated with TAFE NSW Institute of Applied Technology for Construction Project (Project).

This sub plan responds to the requirements stated with the Deed, specifically with how construction traffic will be safely managed on the WSU road network.

2.1 LICENCE PERIOD

The Licence period detailed in the deed as following:

- Commencement Date: 1 August 2021
- Completion Date: April 2023

3.0 CONSTRUCTION PERIOD

The Construction period is proposed as following:

- Commencement Date: 1 August 2021
- Completion Date: April 2023
- TAFE operational readiness: March 2023

3.1 HOURS OF WORK

All works associated with the project shall be undertaken in accordance with the permitted hours of work as outlined within the SSD-8571481 DA Conditions of Consent.

- Mondays to Fridays 7am to 6pm
- Saturdays 8am to 4pm
- Sundays and Public Holidays: No works to be carried out.

It is noted that the termination date of the Deed is stated as 31 March 2023, which will allow for delays to the construction program. Should the construction completion date put the deed termination date at risk, TAFE NSW will consult with WSU at the earliest date possible.

4.0 INSURANCES

The following insurances have been put in place for the duration of the project:

Type	Insurer	Cover	Held By
Project Works Insurance	I Care	\$60,308,740.00	TAFE NSW
Public Liability Insurance	I Care	\$100,000,000.00	TAFE NSW
Professional Indemnity Insurance	Marsh	\$20,000,000.00	ADCO
Workers compensation	I Care	\$30,188,000.00	ADCO

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5.0 TRAFFIC MANAGEMENT STRATEGY- KEY CONSIDERATIONS

The Traffic Management Strategy has been chosen to ensure the safest and most efficient way for road users to interact with the work site and support the appropriate allocation of time, funds and resources for the project. The following have been considered in determining the TTM method:

5.1 CAMPUS STAKEHOLDERS

The site is the TAFE NSW Nepean Kingswood Campus with access roads to the site through the WSU internal road network.

To facilitate construction vehicle access to and from the works site, an Access Deed between TAFE NSW and WSU has been executed which governs construction traffic access within the WSU Werrington Campus road network associated with the TAFE NSW IATC project.

The access roads to the works site contains slight curves (First Avenue, Third Avenue, King Street, Fourth Avenue as well as the internal roads of the TAFE NSW Nepean Kingswood Campus), roundabouts, vegetation, existing signage and infrastructure that may obstruct signs and devices needed for certain strategies.

5.2 STUDENT TRAFFIC AND CAMPUS PARKING

The traffic directional planning associated with the TMP has been developed taking into considerations the parking requirements of the Campus. ADCO Constructions will be providing parking for tradespersons on site within the project as shown on site establishment plan FIG.XXX

5.3 SHUTTLE BUS MOVEMENTS

Western Sydney University runs a shuttle bus service which operates between Kingswood Station and the WSU Kingswood Campus. The shuttle bus service runs approximately every 35 minutes between 7am and 10am weekdays and would serve the students, staff and visitors of WSU. Access to the existing shuttle bus stops within the WSU Campus will be maintained during the construction works

5.4 THE WORK AREA

The area needed to safely perform the work does not require full closures of any sections of the road.

5.5 VULNERABLE ROAD USERS

Desire lines of pedestrians, cyclists, motorcyclists and users of scooters do not generally impact on works or create undesired interaction between these road users and traffic. At some locations, pedestrian crossings are located along the truck access and egress routes within the internal road network to and from the work site, appropriate signage and warning measures will be put into place to ensure safety of pedestrians.

5.6 COMMUNITY AND FACILITY NEEDS

The WSU Campus is located in the vicinity of the site will be affected by the works. Appropriate traffic management measures will be put in place to mitigate any impacts. Ongoing stakeholder

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engagement meetings will be held on a regular basis at which the performance of the traffic management will be reviewed.

5.7 DETOUR OPTIONS

No detours are necessary or proposed by the client and therefore, disproportionate amount of disruption to the road users will NOT be introduced.

5.8 DRIVER CODE OF CONDUCT

All heavy vehicle drivers are required to follow the ingress and egress routes in a “forward in, forward out” manner as described previously, whilst adhering to all road rules and regulations. This in conjunction with the Traffic Guidance Schemes (TGS) prepared in Attachment 2 will be paramount in managing construction activity. In addition, all construction vehicles entering or exiting the site shall always operate under the direction of a TfNSW accredited traffic controllers. Refer **Appendix e** for the ADCO Code of Conduct Flyer to be issued to all trade personnel attending site.

5.9 GEOTECHNICAL ASSESSMENT OF ROADS

In accordance with the Access Licence Agreement 5.3 (a) a Geotechnical Investigation has been carried out in assessment of WSU's road infrastructure. Douglas Partners Geotechnical Consultants have produced a report- Project 203407 dated July 2021 which outlines the findings. In summary the access routes have been deemed to satisfy the requirements of the project with Junctions at First and Third Avenue. Third Avenue and King Street and Great Western Highway onto First Avenue recommended as being monitored throughout the construction process for any impact or deterioration. Refer **Appendix f** for this Geotechnical Report.

5.10 EXPECTED PERSONNEL NUMBERS ON SITE

The construction project will run from October 2021 through to February 2023. Anticipated number on site will fluctuate however it is anticipated personnel numbers will grow to a maximum of **230** workers mid 2022. Refer Figure 7.10 below for project numbers trajectory.

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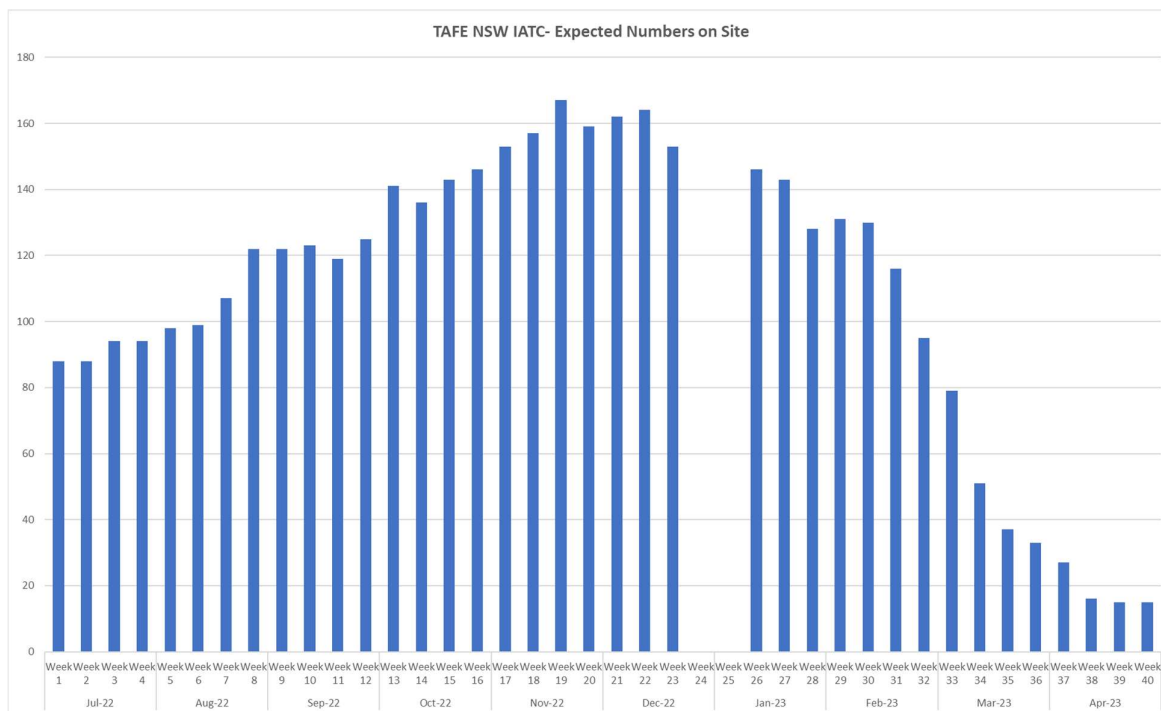


Figure 7.10

6.0 TRAFFIC MANAGEMENT PLAN

Route 1 - IATC Site

As per the TAFE NSW/WSU Access Deed Agreement, access to the IATC site is proposed to be via Great Western Highway, First Avenue, Third Avenue and King Street. A Works Zone is proposed to be provided to the east of the IATC site, which is accessible from King Street, whereby construction vehicles will enter the Works Zone just prior to the existing at-grade car park adjacent to the WSU Building BA.

Construction vehicle access gates to the IATC site and associated Works Zone area are proposed to be approximately 14m in width. The proposed site access locations for the IATC site are shown in **Appendix C** where ADCO Escort Vehicles operated by Licenced Traffic Controllers will escort vehicles through the WSU Campus onto site.

The swept path assessment undertaken demonstrates access and egress is possible for a 19m AV, with appropriate traffic control measures. Refer **Appendix A** for Swept Path Analysis. During major concrete pours and for larger continuous deliveries, traffic controllers will be stationed as per **Appendix D** Traffic Guidance Scheme where Traffic Controllers will be utilised.

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Fig 8.0 Traffic Route

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- **Route 1 Entry (All construction vehicles) Refer Appendix C and Appendix D**

1. Trucks arrive along Great Western Highway, eastbound or westbound
2. Turn onto First Avenue, south bound
3. Turn right into Third Avenue
4. Turn right into King Street
5. Continue northbound to the IATC site.
- 6.

- **Route 1 Exit (All construction vehicles) Refer Appendix C and Appendix D**

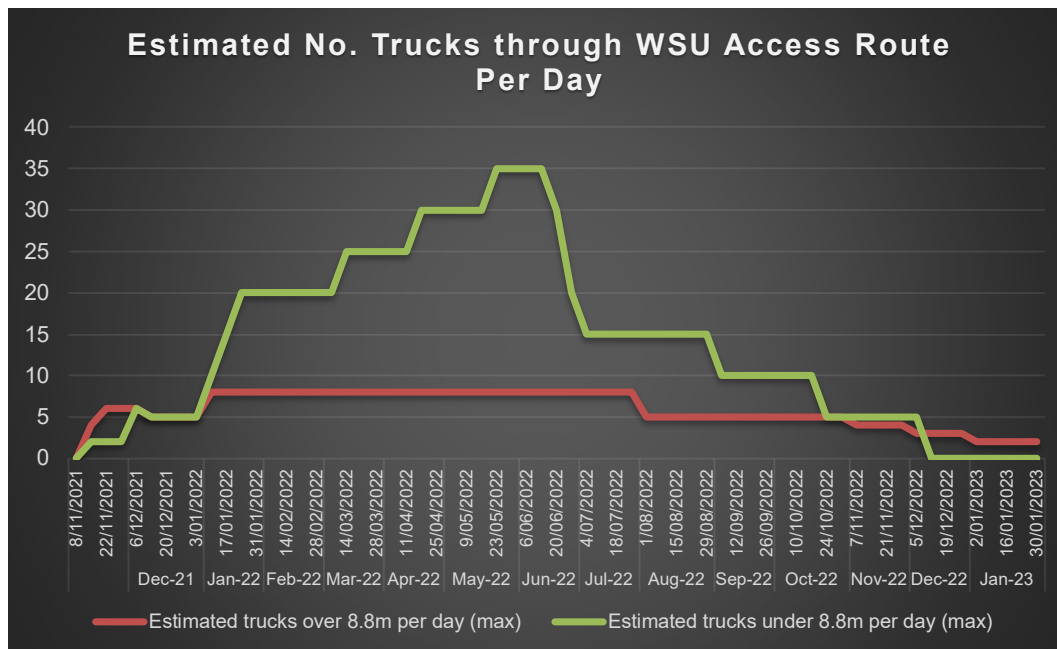
1. Trucks continue along the King Streetin as per Appendix D.
2. Continue past Fourth Avenue as per Appendix D.
3. Turn left at First Avenue as per Appendix D.
4. Turn left or right at Great Western Highway.

6.3 EXPECTED TRUCK MOVEMENTS ON ROUTE 1 ACCESS ROADS

Through the first and second quarters of 2022 ADCO Constructions will be forming and building the projects structure. Through this period there will be increased traffic with concrete trucks entering and exiting site on a regular basis. In parallel to this all terrain cranes will be attending site with reinforcement deliveries. These movements of vehicles are outlined on the below graph.

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TRAFFIC MANAGEMENT PLAN- WSU SPECIFIC



7.0 TRAFFIC MANAGEMENT PLAN AND WSU ACCESS DEED- MANAGEMENT & GOVERNANCE

TAFE NSW shall facilitate a construction interface stakeholder meeting with WSU on a fortnightly basis. This meeting shall facilitate discussion of the following items:

- Construction Program look ahead – short range (fortnight look ahead)
- Construction disruptive activities – Generally activities outside of the site compound, services shutdowns and or unusual traffic movements
- Traffic Management
 - Safety review – both good practices and those in need of improvement
 - Route review – table any suggested amendments
 - Road condition review – table any concerns with condition of roads. Allow inspection of roads if required. Rectification methods are also to be discussed and agreed

In addition to the above monthly interface meeting, it is proposed that the following meetings also take place at the times suggested below:

- CTMP Health Check – Quarterly
- WSU Road Health Check – Quarterly & at construction completion.

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TRAFFIC MANAGEMENT PLAN- WSU SPECIFIC



7.1 CONSTRUCTION ACCESS ROUTE

The proposed access route for the commencement of the Project can be referenced in Appendix A of the Construction Traffic Management Plan. Once agreed by WSU, this will become the approved construction traffic route.

From time to time, there may be a requirement to amend the approved CTMP. Any amendments to the approved CTMP are to be presented to WSU for review, comment and approval.

7.2 PARKING

The site compound has provisions for all contractor parking associated with the Project. There will be no parking permitted on WSU property without prior agreement.

In accordance with the site setup, all vehicles will enter and leave the site in a forward direction. No trucks will be permitted to wait or queue on WSU property. ADCO Constructions authorised traffic controllers will police contractor parking. ADCO constructions include firm rules and regulations within subcontractors' contracts where repeat offenders will be dismissed from site/campus.

7.3 MONITORING, MAINTENANCE & MAKE GOOD

Prior to the undertaking the first vehicle movement on the WSU site, a complete dilapidation report shall be undertaken and issued for record. A regular maintenance regime shall be active for the duration of the construction works which shall include the following:

- Pre-start condition checks – Daily
- Street Sweeping – When required
- End of week checks to ensure roads will not impact or hinder weekend users of the WSU campus.

Should any condition of the road impacted by the Project pose a safety risk to either road and or pedestrian path users, the Contractor shall undertake immediate temporary repair and damage works to be agreed with WSU representative.

On completion of the construction works, a final condition report shall be prepared and issued to WSU for review and comment. Any outstanding rectification works shall be agreed by the parties and rectified in a timeframe also agreed by the parties. All Temporary restoration during construction will be completely restored to match the existing finishes (prior to construction)

7.4 PROJECT COMMUNICATION

All project communications are to be agreed between TAFE NSW and WSU in accordance with the agreed communications plan.

The Contractor shall present any information necessary to facilitate the communication of construction traffic management related issues. Such communication forums can include.

- Scheduled Walks- TAFE/WSU/ADCO
- Reporting processes
- Short Range Programme Updates
- Key Activities- notice
- Traffic Control PreStarts- Attendance as required
- Exposure to ADCO crane board as required
- Direct on site communication with ADCO's logistics coordinator

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9.0 SUMMARY

This Traffic Management Plan has been developed for the construction activities associated with the construction of the TAFE NSW IATC at 2-44 O'Connell Street, Kingwood. This report outlines the traffic process associated with the construction work, as well as the traffic management measures to improve and regulate the safety of pedestrians, cyclists, motorists, and works in the site vicinity.

It is envisaged that this document will be continually reviewed and amended if required, in the event of changes to design, the surrounding road network, or additional requirements of Council, or any other relevant authority. ADCO respect and understand the Access Licence Agreement in place between WSU and TAFE NSW and are available to attend further discussions, planning forums or presentations of the information within this document as required.

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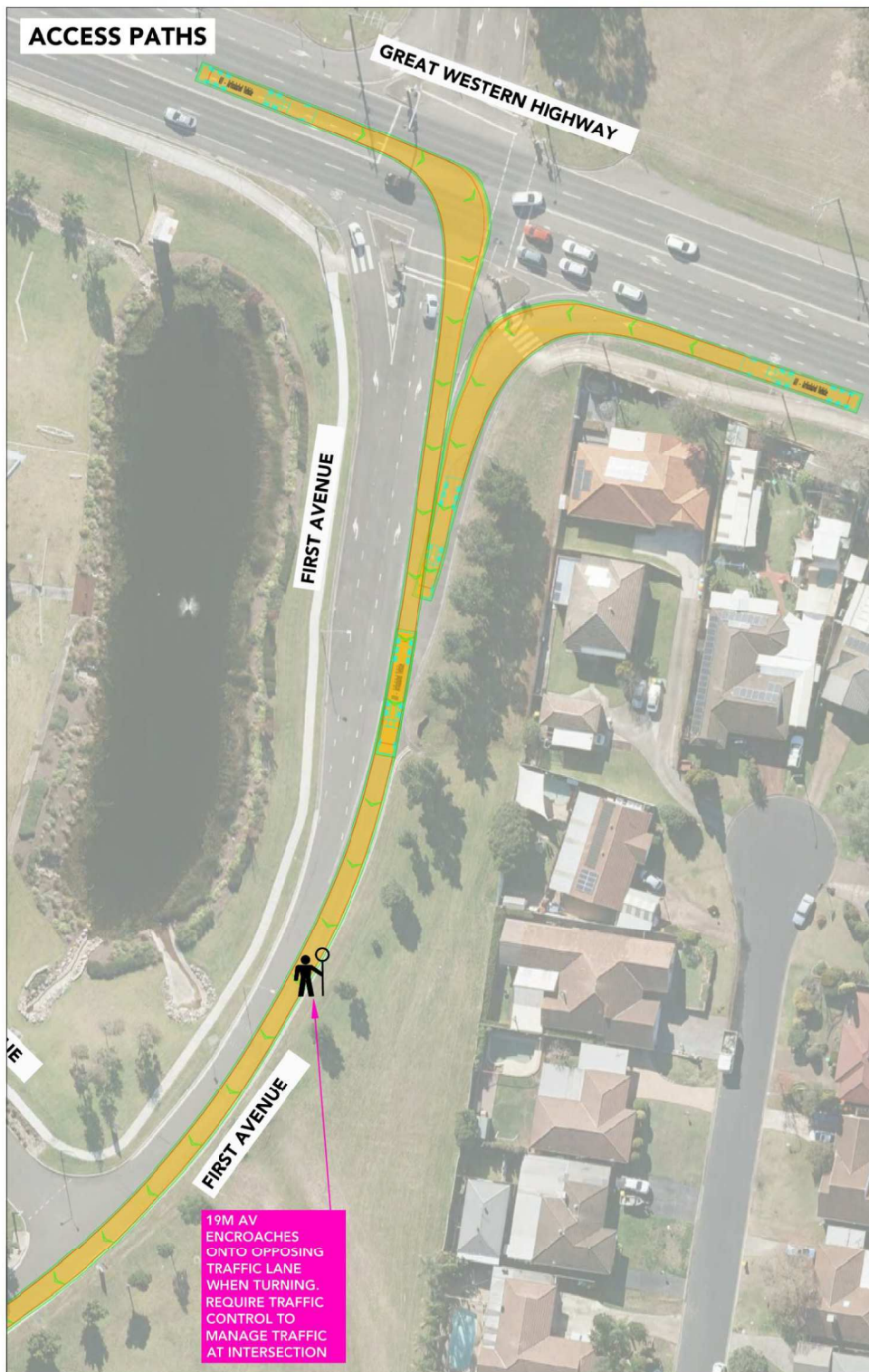


APPENDIX A

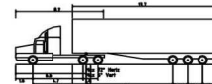
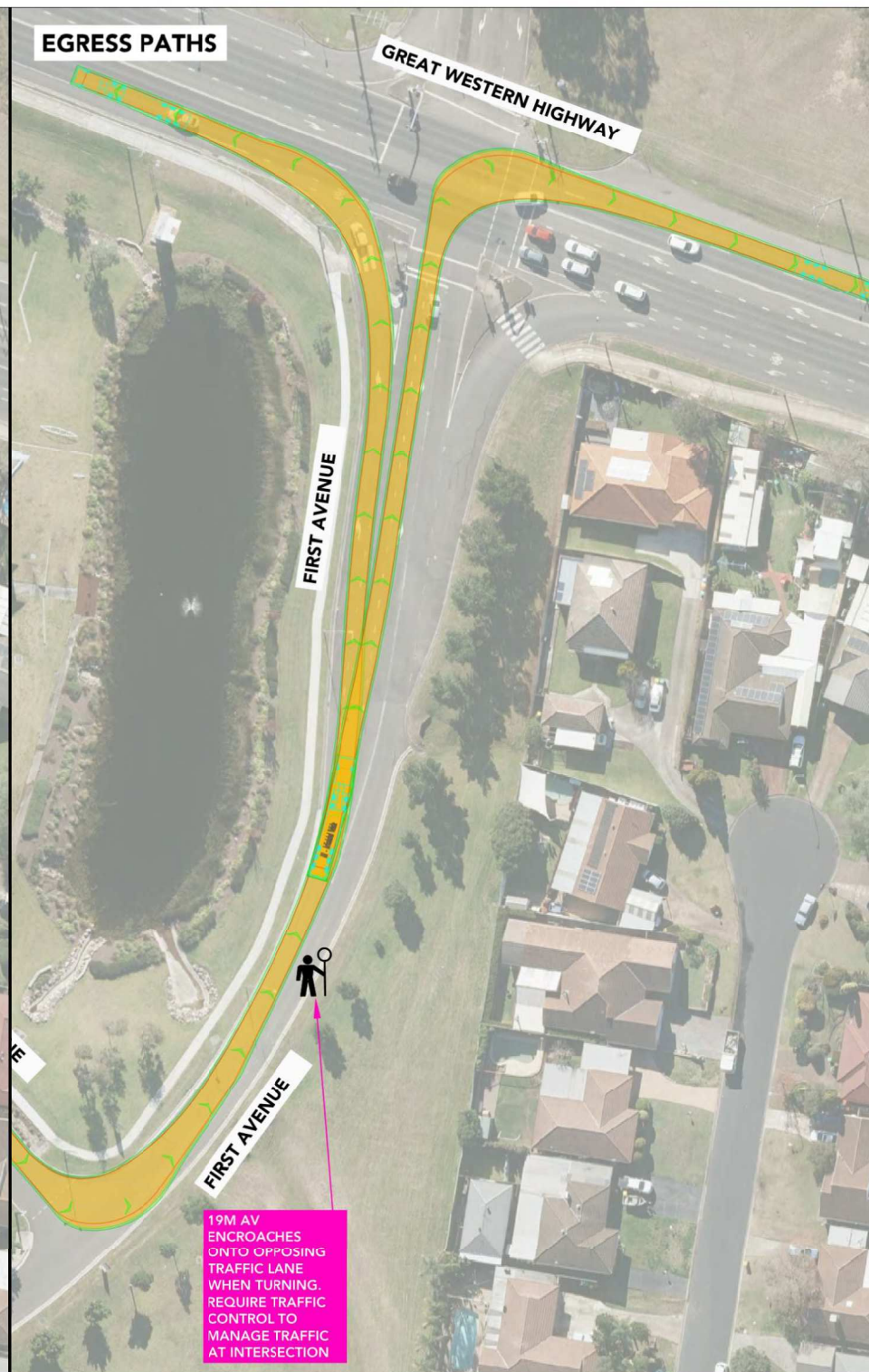
TMP- SWEPT PATH ANALYSIS

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ACCESS PATHS



EGRESS PATHS



AV - Articulated Vehicle	19.00m
Overall Length	19.00m
Overall Width	2.50m
Overall Height	4.00m
Min. Body Ground Clearance	0.50m
Front Overlap	1.00m
LWB to LWB Turning Radius	12.00m

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
4	18/11/21	FOR COORDINATION	HL	SW
3	11/11/21	FOR COORDINATION	HLKY	SW
P2	06/11/21	FOR COORDINATION	HLKY	SW
P1	01/11/21	Option 1 Assessment	SW	SW

PROJECT
TAFE NSW CONSTRUCTION
CENTRE OF EXCELLENCE

DRAWING TITLE
Construction Access & Egress
Route 1
Sheet 1

DRAWING KEY

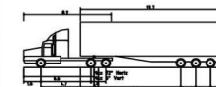
ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 9920 0800
ptcconsultants.co

CLIENT ADCO
DRAWING # R1-001
PROJECT # 21-5511
SCALE 1:750 @ A3



PRELIMINARY

REV P4



AV - Articulated Vehicle	
Overall Length	20.00m
Overall Height	4.00m
Overall Width	2.50m
Min. Road Clearance	4.50m
Front Overlap	1.00m
LWB to LWB Turning Radius	12.00m

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
4	18/11/21	FOR COORDINATION	HL	SW
3	11/11/21	FOR COORDINATION	HLKY	SW
P2	08/11/21	FOR COORDINATION	HLKY	SW
P1	01/11/21	Option 1 Assessment	SW	SW

PROJECT
TAFE NSW CONSTRUCTION
CENTRE OF EXCELLENCE

DRAWING TITLE
Construction Access
Route 1
Sheet 2

DRAWING KEY

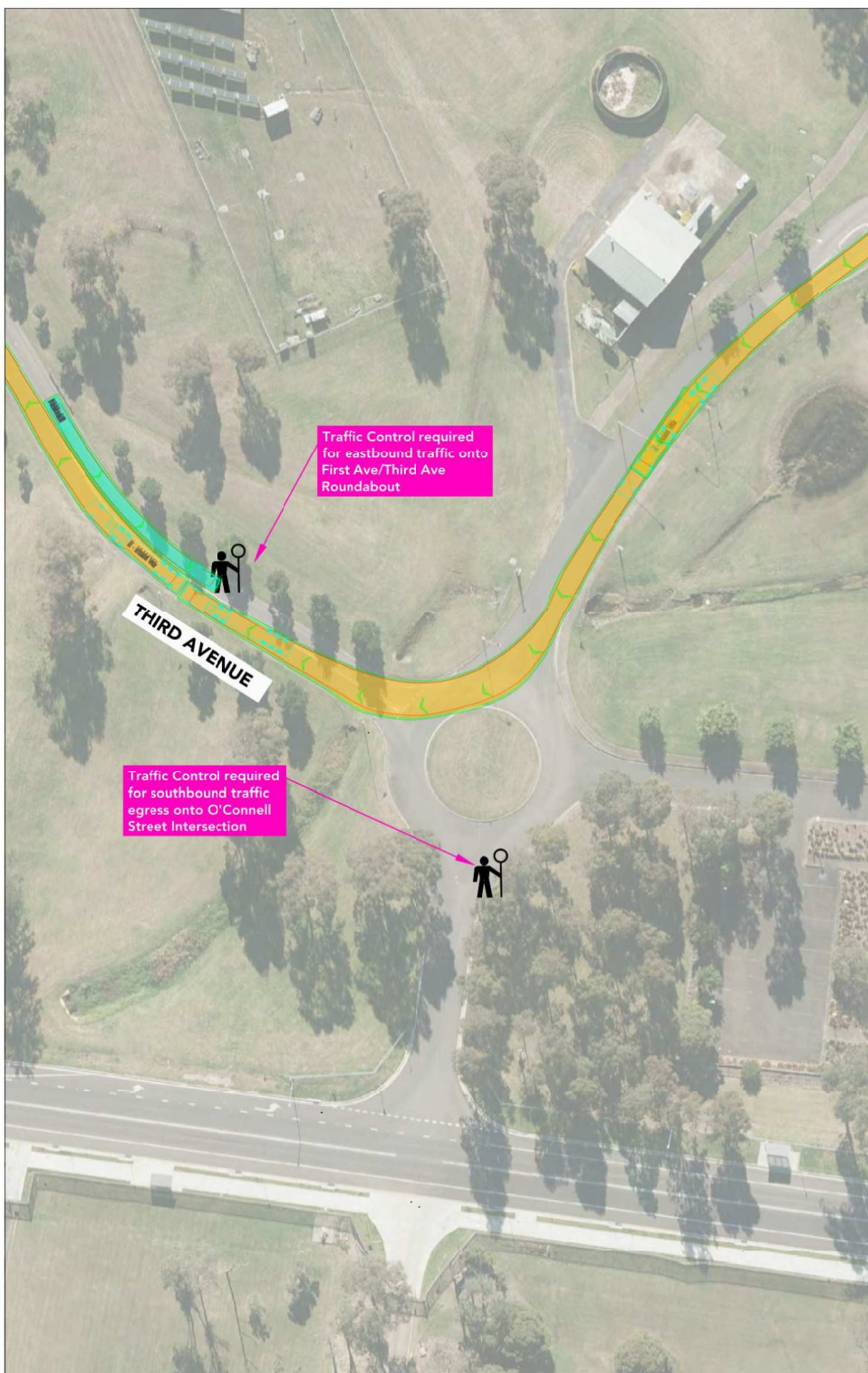
ptc. Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 9920 0800
pticonsultants.co

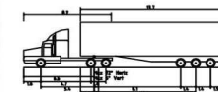
CLIENT ADCO
DRAWING # R1-002
PROJECT # 21-5511
SCALE 1:750 @ A3



FRELIMINARY

REV P4





AV - Articulated Vehicle	
Overall Length	20.00m
Overall Height	4.00m
Overall Width	2.50m
Max. Road Clearance	4.50m
Max. Wheelbase	10.00m
Max. Turning Radius	12.00m

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
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B	11/11/21	FOR COORDINATION	HLXY	SW
P2	06/11/21	FOR COORDINATION	HLXY	SW
P1	01/11/21	Option 1 Assessment	SW	SW

PROJECT
TAFE NSW CONSTRUCTION
CENTRE OF EXCELLENCE

DRAWING TITLE
Construction Access & Egress
Option 1
Sheet 3

DRAWING KEY

ptc. Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 9920 0800
ptcconsultants.co

CLIENT	ADCO
DRAWING #	R1-003
PROJECT #	21-5511
SCALE	1 : 750 @ A3

PRELIMINARY

REV P4

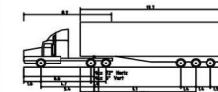
19M AV REQUIRES ENTIRE
ROADWAY BETWEEN
WORKS ZONE AND KING
STREET/FOURTH AVENUE
ROUNDBOUT. REQUIRE
TRAFFIC CONTROL TO
MANAGE TRAFFIC AT
INTERSECTION &
MONITOR PARKING

WORKS ZONE

KING STREET

FOURTH AVENUE

19M AV REQUIRES
ENTIRE ROADWAY
BETWEEN WORKS ZONE
AND KING
STREET/FOURTH AVENUE
ROUNDBOUT. REQUIRE
TRAFFIC CONTROL TO
MANAGE TRAFFIC AT
INTERSECTION



AV - Articulated Vehicle	20.00m
Overall Length	2.50m
Overall Width	4.00m
Overall Height	12.00m
Wheel Base	12.00m
Turn Radius	12.00m

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
4	18/11/21	FOR COORDINATION	HL	SW
3	11/11/21	FOR COORDINATION	HL	SW
P2	08/11/21	FOR COORDINATION	HL	SW
P1	01/11/21	Option 1 Assessment	SW	SW

PROJECT
TAFE NSW CONSTRUCTION
CENTRE OF EXCELLENCE

DRAWING TITLE
Construction Access & Egress
Route 1
Sheet 4

DRAWING KEY

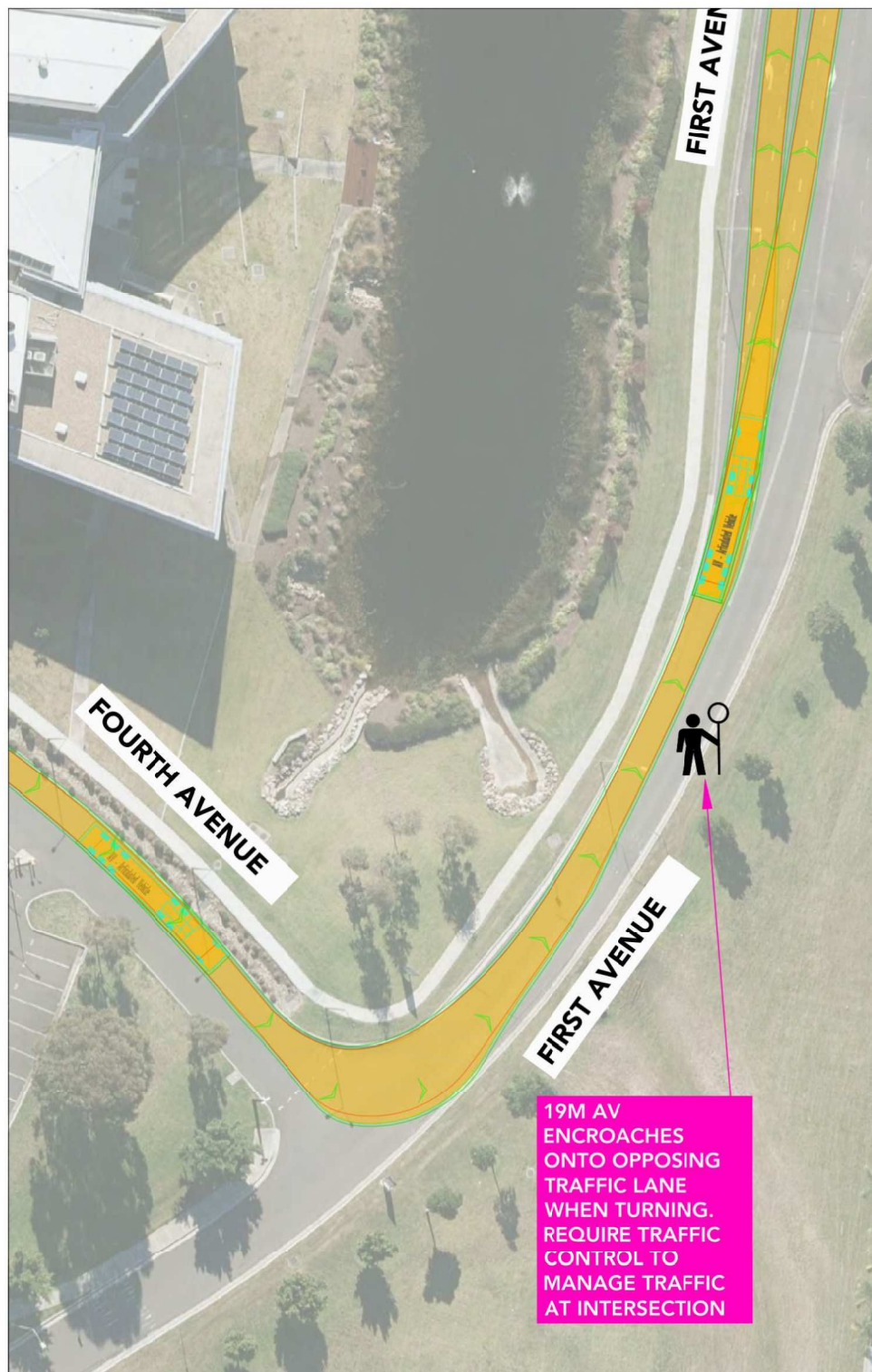
ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
t +61 2 9920 0800
pticonsultants.co

CLIENT ADCO
DRAWING # OPT1-004
PROJECT # 21-5517
SCALE 1 : 500 @ A3



PRELIMINARY

REV P4

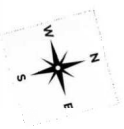


APPENDIX B

ADCO CONSTRUCTIONS- SITE COMPOUND

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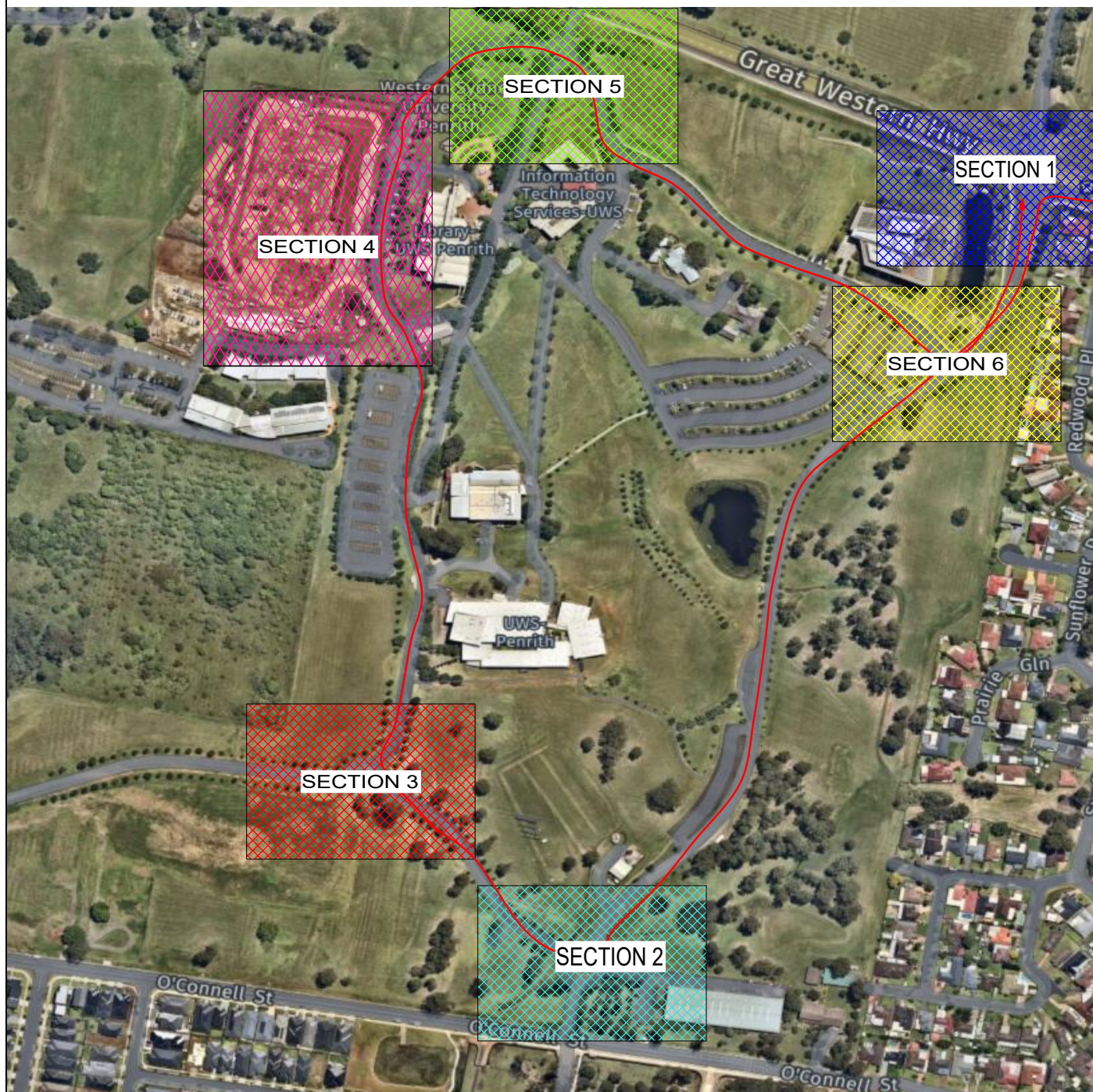
Truck Exit Gate 3



APPENDIX C

TRAFFIC GUIDENCE SCHEME- ESCORT VEHICLES

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THE FOLLOW PLANS INDICATE THE ACCESS FOR SITE DELIVERY VEHICLES ENTERING AND EXITING VIA THE GREAT WESTERN HIGHWAY INTERSECTION.

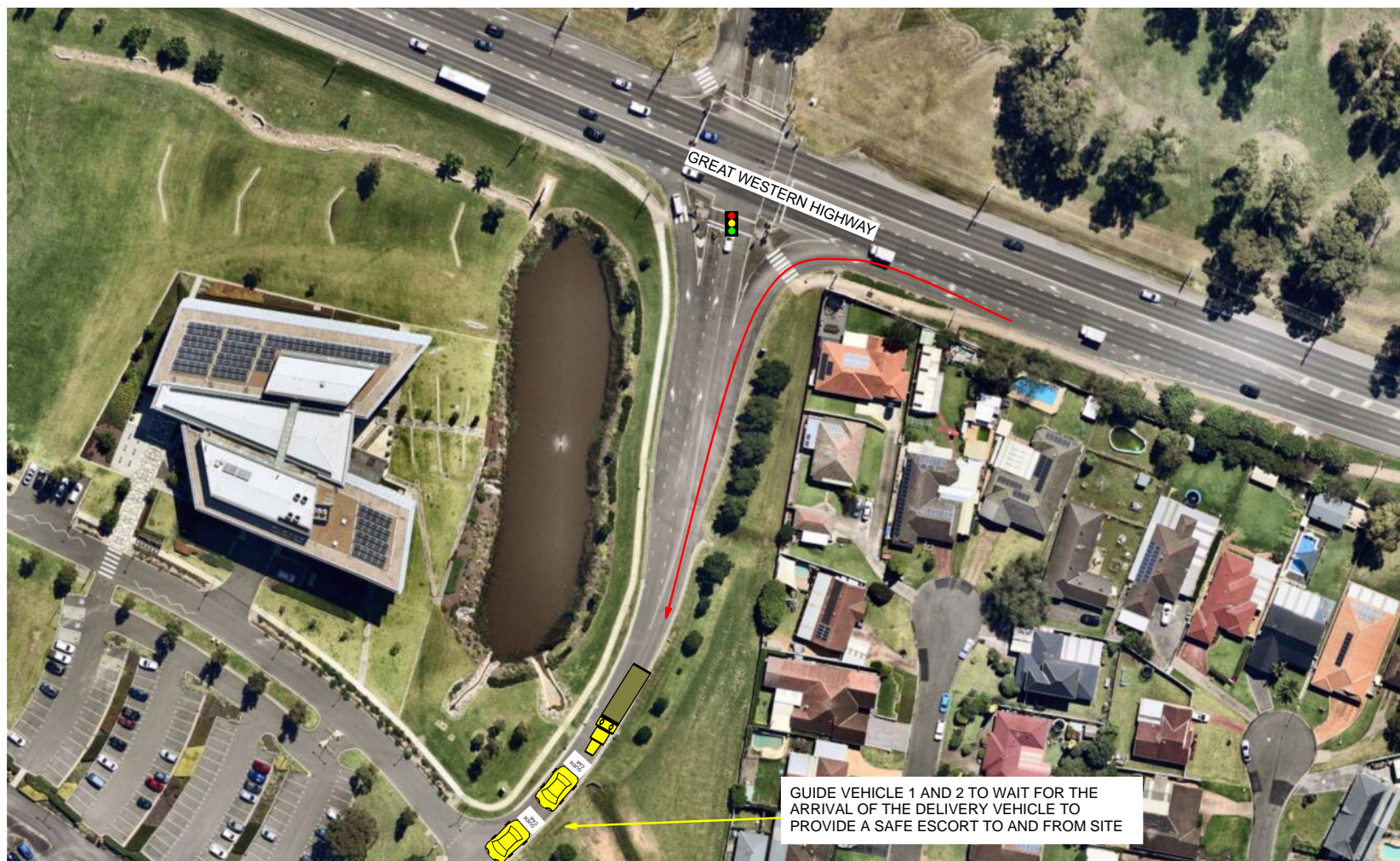
EACH SECTION DISPLAYS THE LOCATION OF GUIDE VEHICLES TO SAFELY HOLD TRAFFIC AND ALLOW THE MOVEMENT OF SITE DELIVERY VEHICLES.


TWO RADIO COMMUNICATION MUST BE MAINTAINED AT ALL TIMES BETWEEN PILOT VEHICLES OPERATORS AND DELIVERY VEHICLES OPERATORS

UNIVERSITY GROUNDS SPEED LIMIT AND RULES MUST BE OBEYED AT ALL TIMES

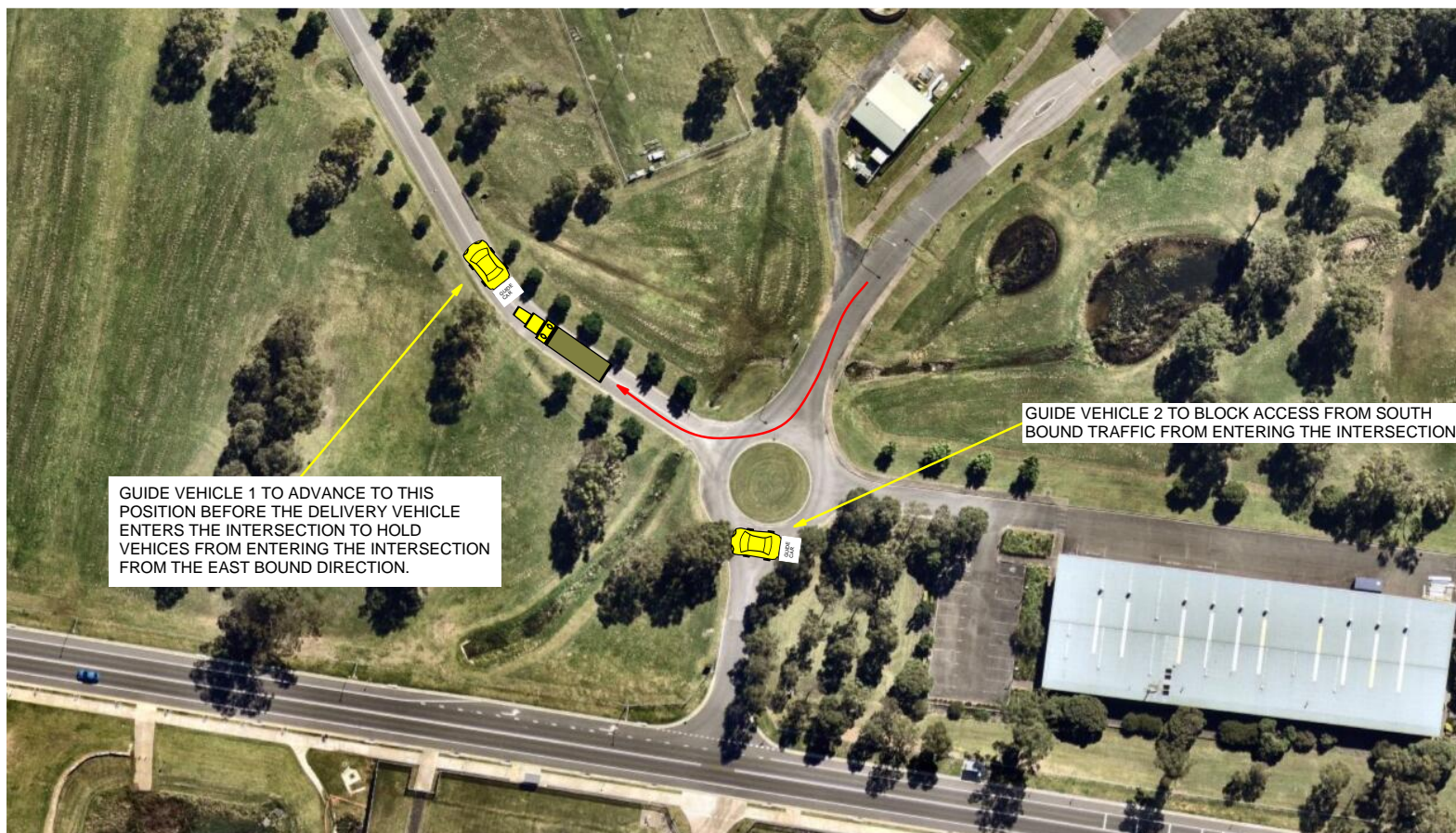
AMBER FLASHING LIGHTS AND/OR AMBER INDICATORS MUST BE ACTIVATED AT ALL TIMES


ONLY OPERATORS WITH A NSW DRIVERS LICENSE ARE TO BE IN CONTROL OF ANY VEHICLE WHILST ONSITE



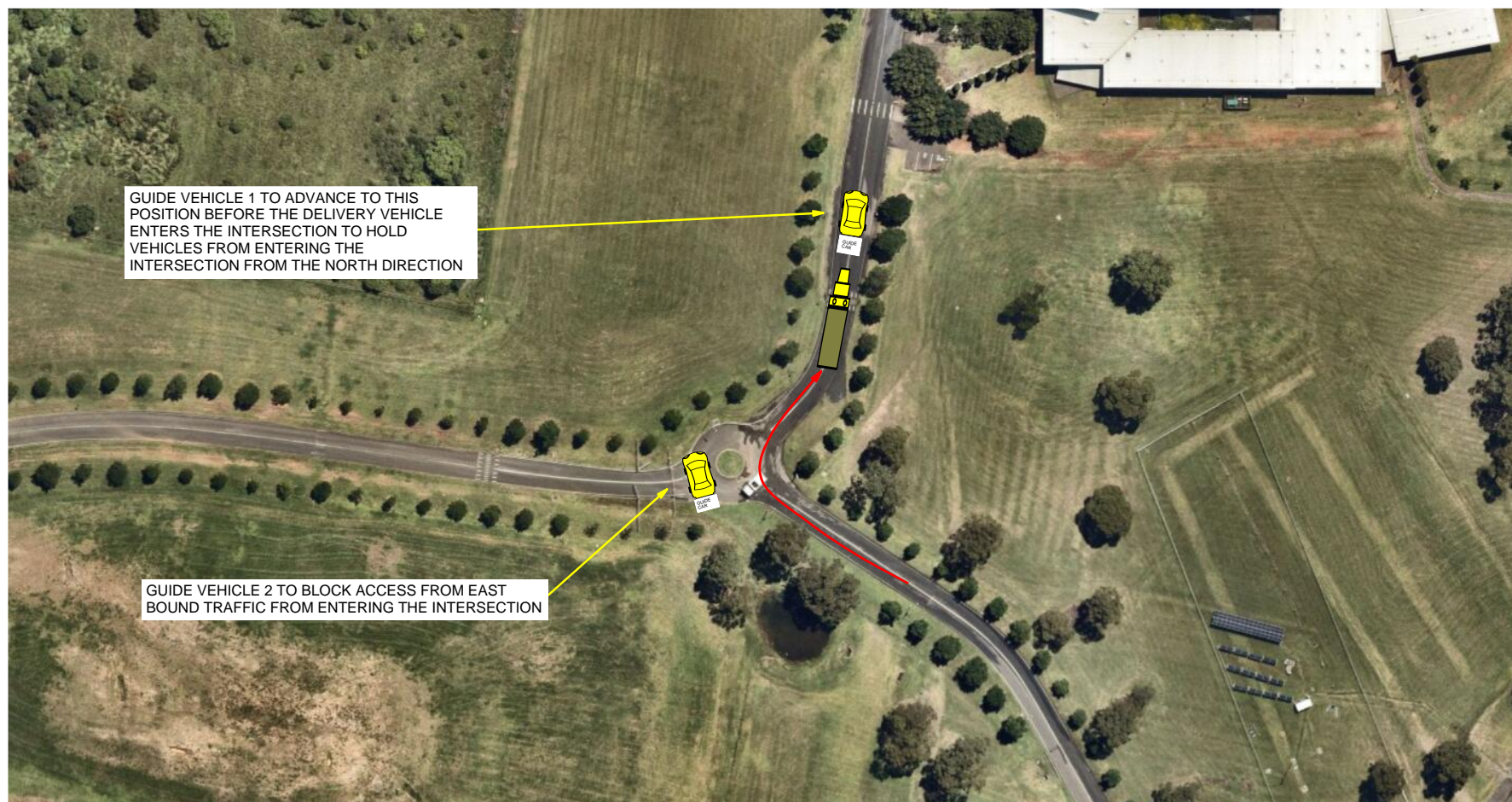
	Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS Comments:	Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)	Manifest
	VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY		2 x guide vehicle 1 x traffic light 1 x tray truck


SECTION 1



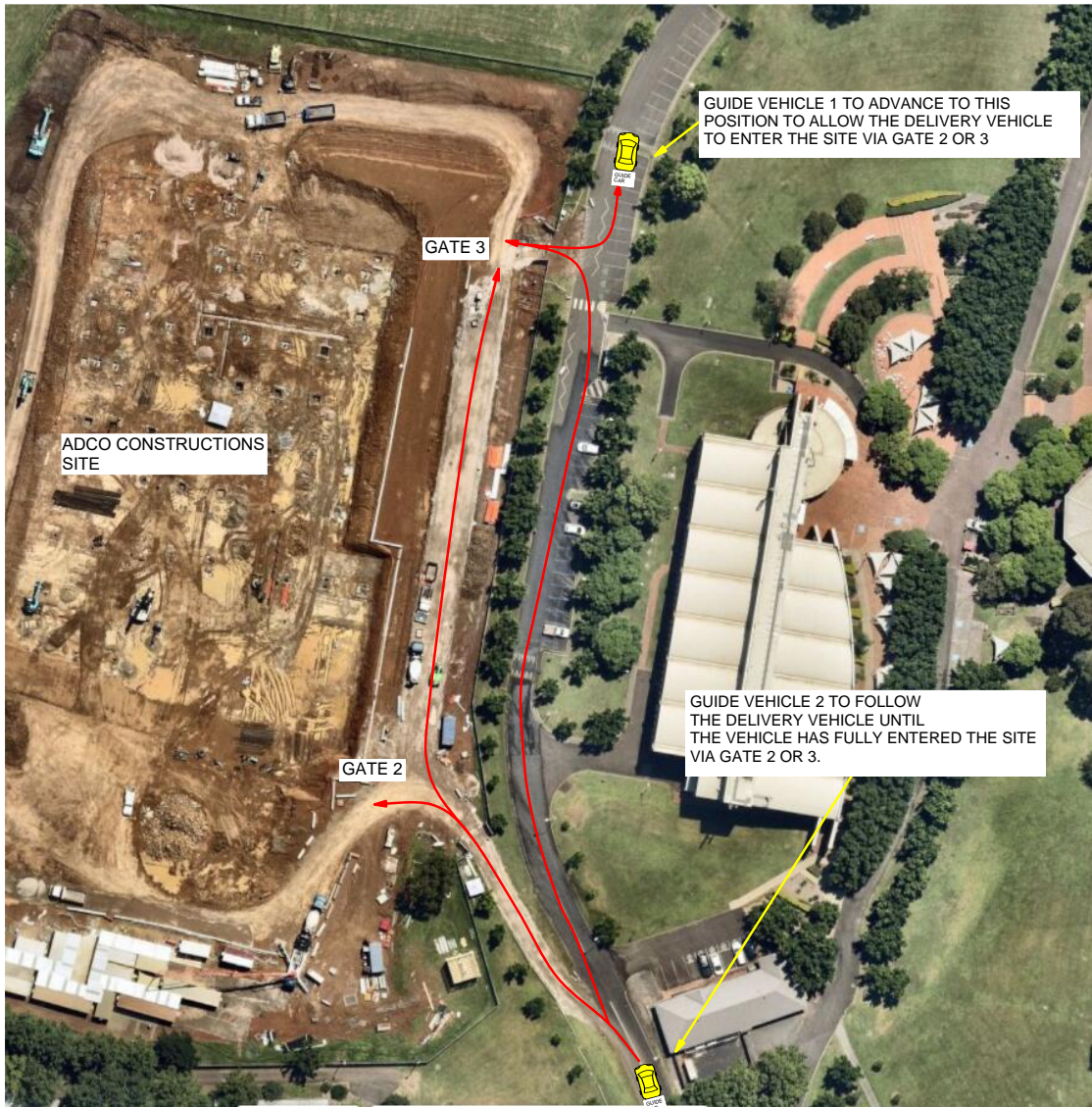
	Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS Comments:	Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)	Manifest
	VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY		2 x guide vehicle 1 x tray truck


SECTION 2



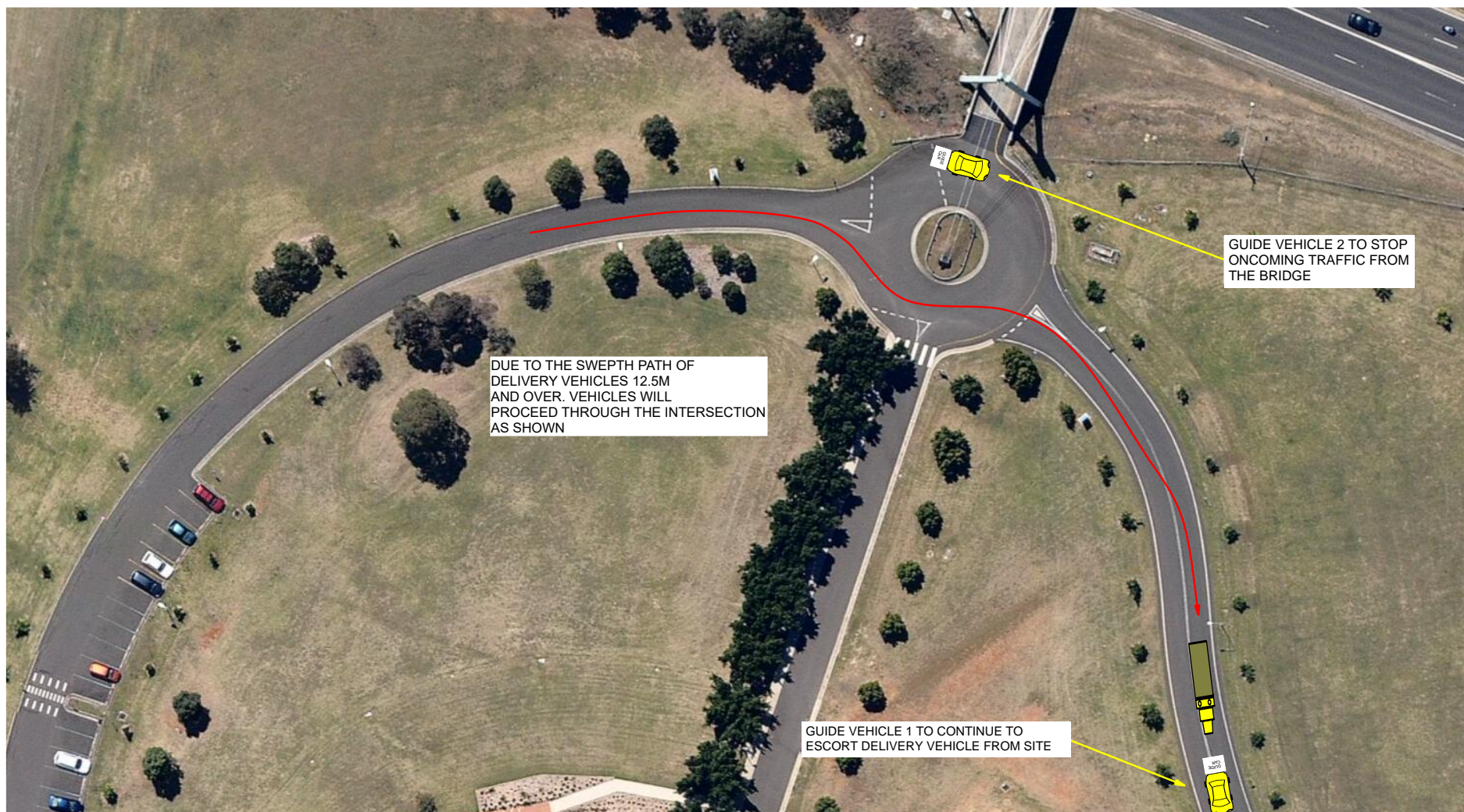
	Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS Comments:	Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)	Manifest
	VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY		2 x guide vehicle 1 x tray truck


SECTION 3



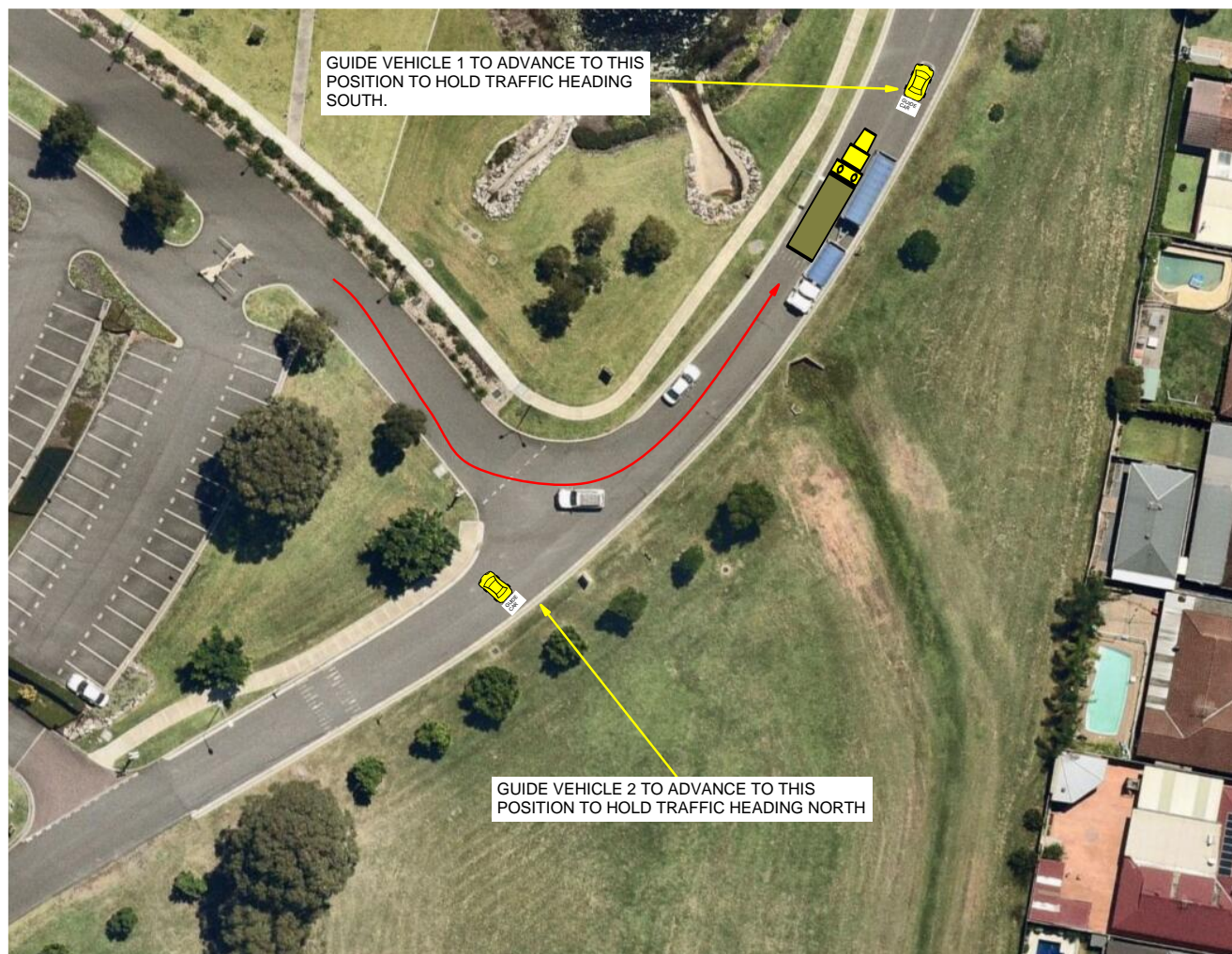
	<p>Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS</p> <p>Comments: VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY</p>	<p>Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)</p>	<p>Manifest</p> <p>2 x guide vehicle</p>
---	--	--	---

SECTION 4



	Date: 19/04/2022 Author: Steven Spiteri 2452057913 Project: ADCO CONSTRUCTIONS	Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)	Manifest
	Comments: VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY		2 x guide vehicle 1 x tray truck

SECTION 5



JARRAH

Date: 19/04/2022 **Author:** Steven Spiteri 2452057913 **Project:** ADCO CONSTRUCTIONS

Comments:
VEHICLE ENTRY/EXIT PLANS FROM GREAT WESTERN HIGHWAY TO SITE ENTRY GATES
AND EXIT FROM SITE TO GREAT WESTERN HIGHWAY

Traffic control warning signs and devices must be implemented and operated in accordance with AS1742-3-2009 (manual of traffic control devices) and RMS NSW TCAWS-V5 technical manual (traffic control at work sites)

Manifest

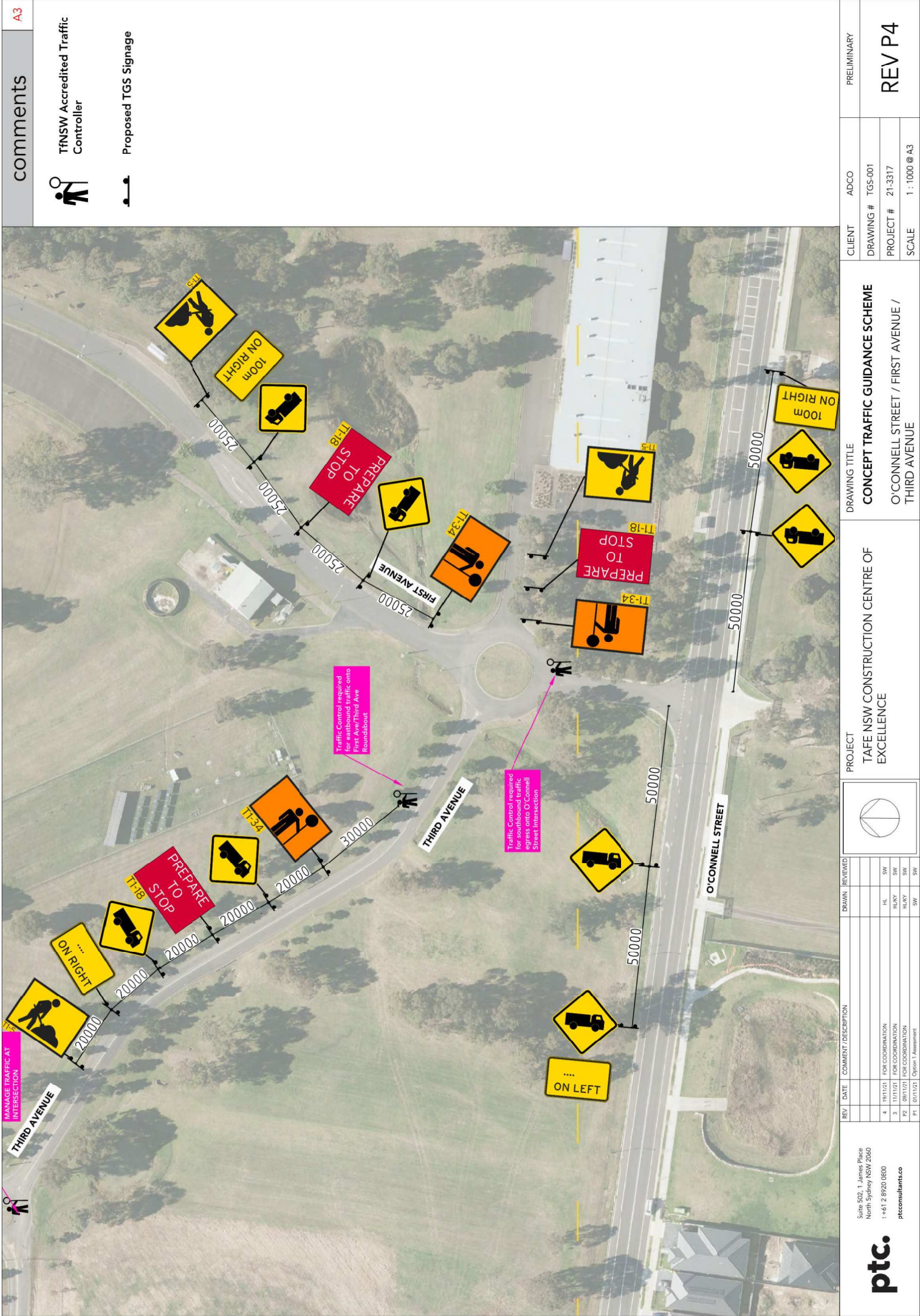
2 x guide vehicle
1 x tray truck

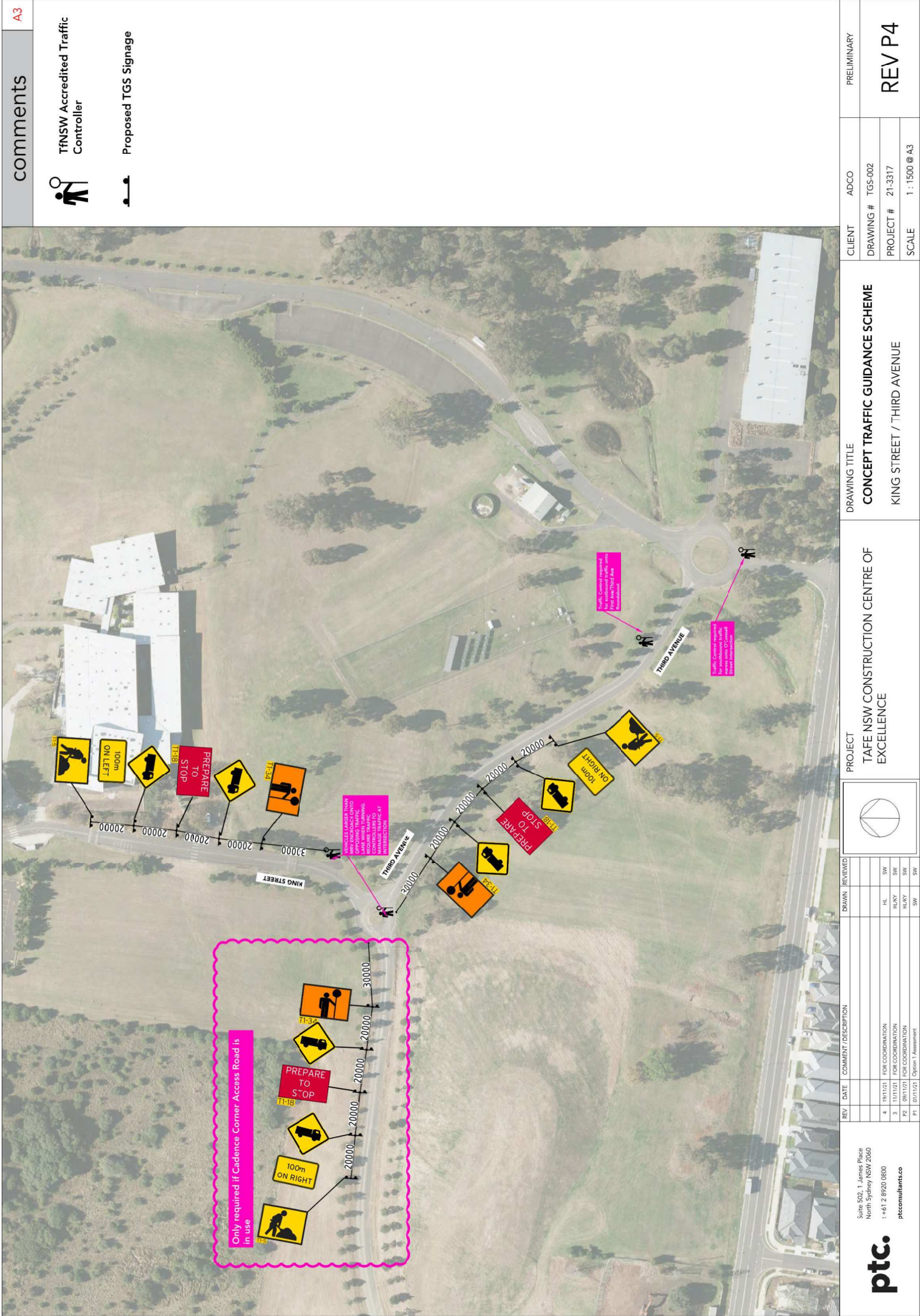
SECTION 6

APPENDIX D

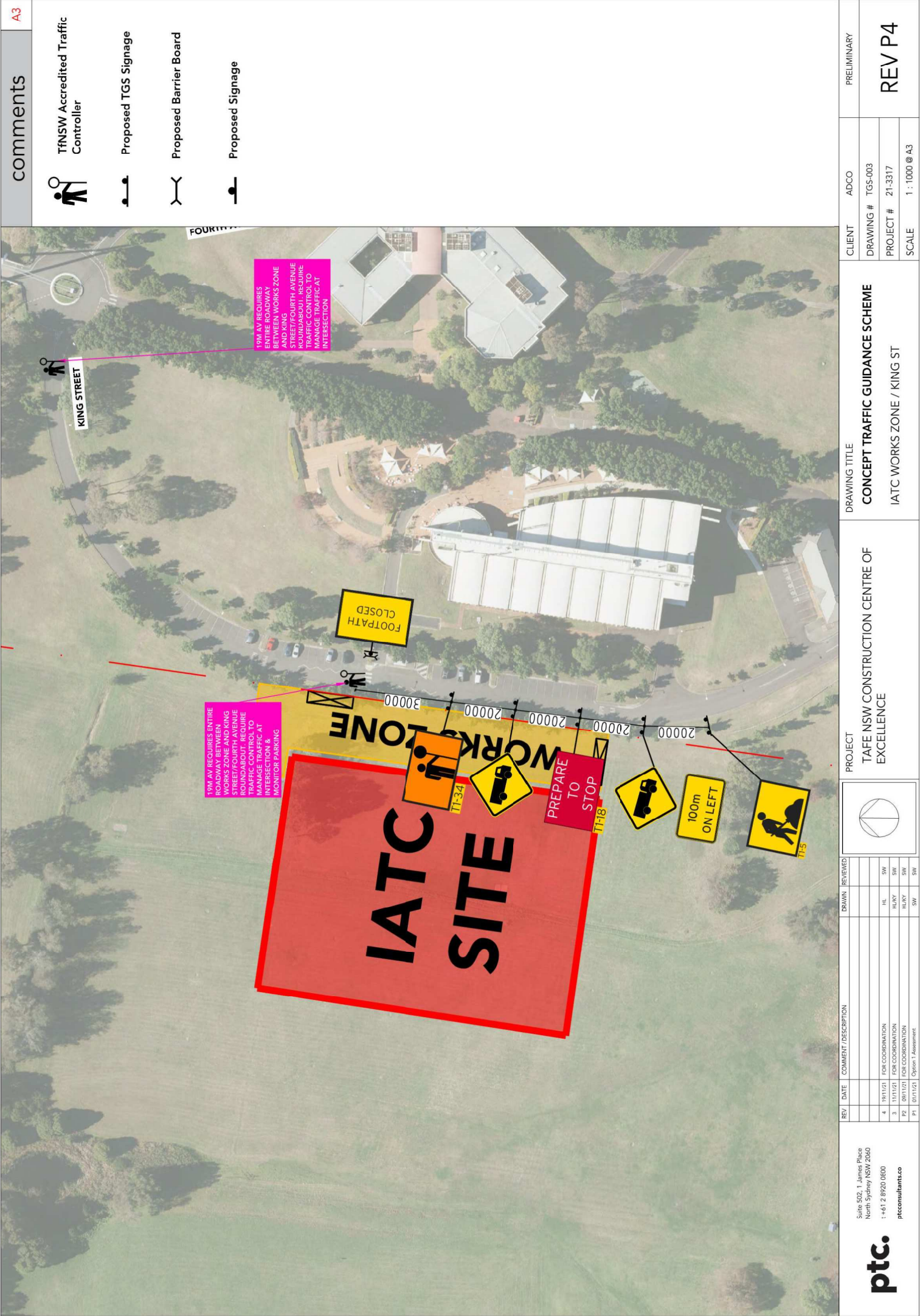
TRAFFIC GUIDANCE SCHEME- TRAFFIC CONTROL (HEAVY VEHICLE MOVEMENT DAYS)

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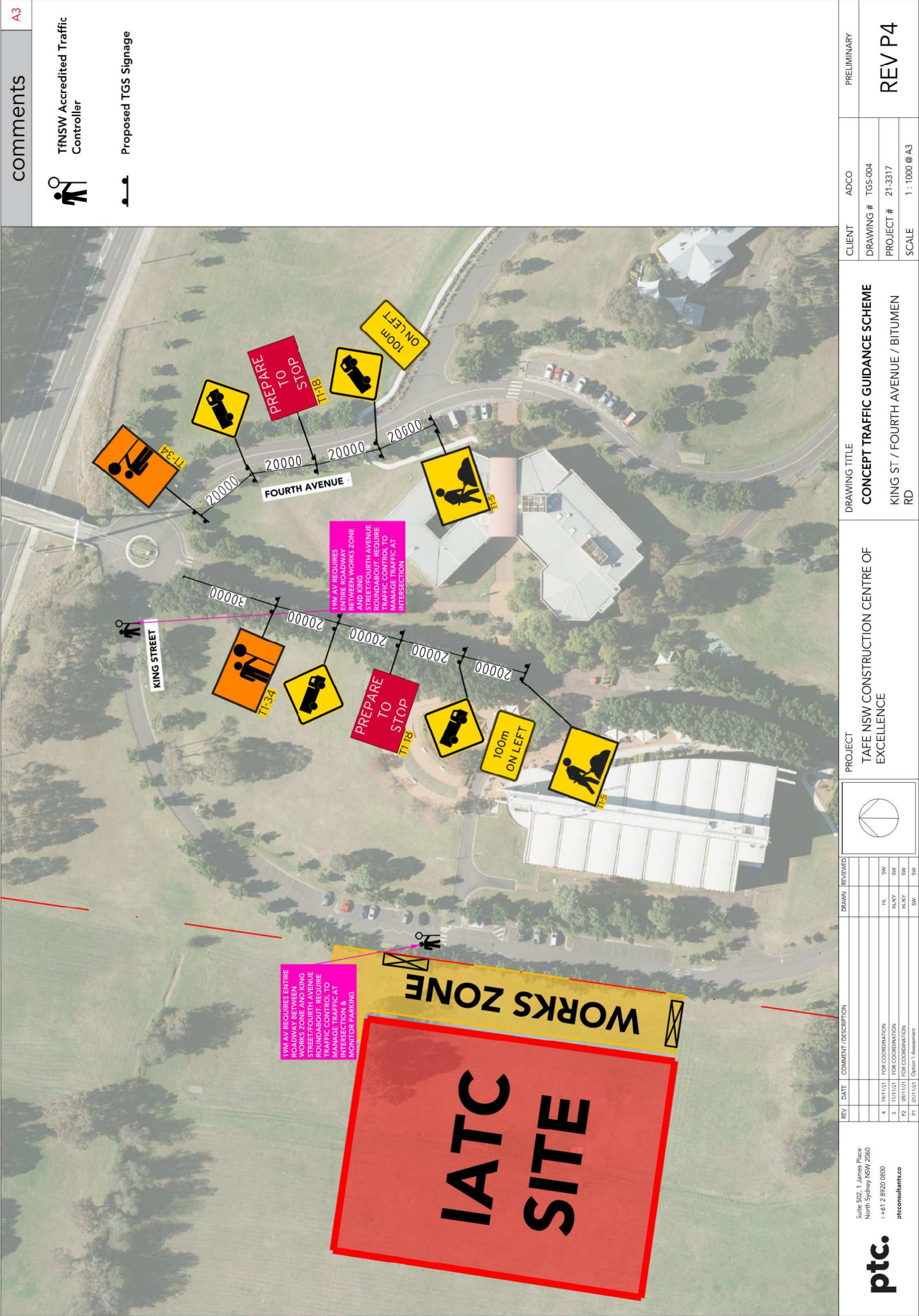


comments	A3	
TfNSW Accredited Traffic Controller		
Proposed TGS Signage		
CLIENT	ADCO	
DRAWING #	TGS-002	
PROJECT #	21-3317	
SCALE	1 : 1500 @ A3	
DRAWING TITLE	CONCEPT TRAFFIC GUIDANCE SCHEME	
	KING STREET / THIRD AVENUE	
PROJECT	TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE	
REV	DATE	COMMENT / DESCRIPTION
1	19/11/21	FOR COORDINATION
2	11/11/21	FOR COORDINATION
3	09/11/21	FOR COORDINATION
4	07/11/21	Option 1 Assessment



comments		A3
	TfNSW Accredited Traffic Controller	
	Proposed TGS Signage	
	Proposed Barrier Board	
	Proposed Signage	

 Suite 502, 1 James Place North Sydney NSW 2060 1 +61 2 8920 0800 pticonsultants.co	REV		DATE	COMMENT / DESCRIPTION	DRAWN		REVIEWED			PROJECT TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE	DRAWING TITLE CONCEPT TRAFFIC GUIDANCE SCHEME IATC WORKS ZONE / KING ST	CLIENT ADCO	DRAWING # TGS-003	PROJECT # 21-3317	SCALE 1 : 1000 @ A3	PRELIMINARY
	4	19/11/21		FOR COORDINATION	HL	SW										
	3	11/11/21		FOR COORDINATION	HUKY	SW										
	P2	09/11/21		FOR COORDINATION	SW	SW										
	P1	01/11/21		Option 1 Assessment	SW	SW										



comments

A3



TfNSW Accredited Traffic Controller



Proposed TGS Signage

 Suite 502, 1 James Place North Sydney NSW 2060 t+61 2 8920 0800 pticonsultants.co	REV		DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED	PROJECT		DRAWING TITLE		CLIENT	ADCO	PRELIMINARY
	4	19/11/21	FOR COORDINATION		HL	SW	TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE		CONCEPT TRAFFIC GUIDANCE SCHEME		DRAWING #	TGS-004	
	3	11/11/21	FOR COORDINATION		HL	SW	KING ST / FOURTH AVENUE / BITUMEN RD				PROJECT #	21-3317	
	P1	09/11/21	FOR COORDINATION		HL	SW					SCALE	1 : 1000 @ A3	REV P4



comments

A3

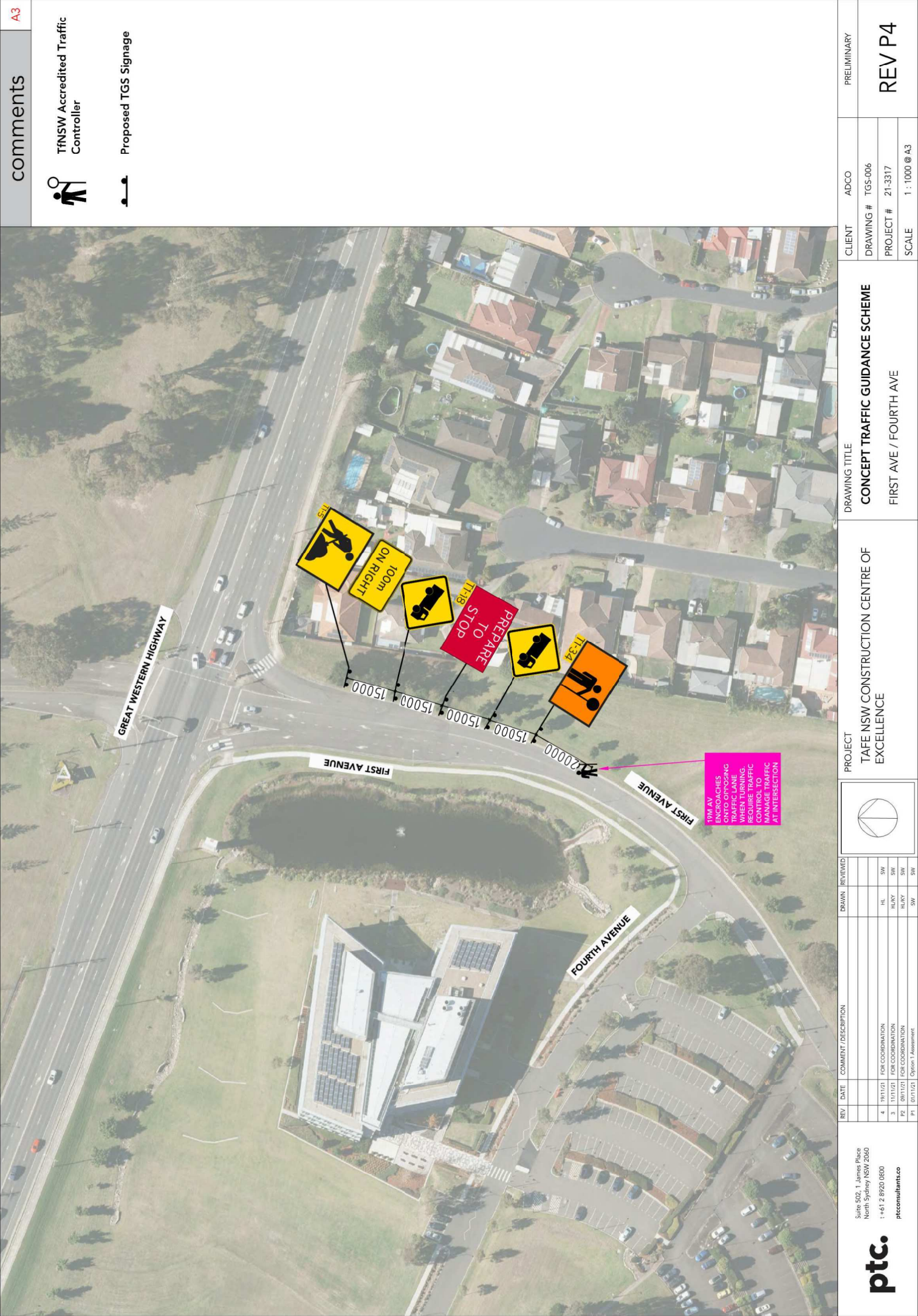


TfNSW Accredited Traffic Controller



Proposed TGS Signage

 Suite 502, 1 James Place North Sydney NSW 2060 1+461 2 8920 0800 pticonsultants.co	REV		DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED	PROJECT		DRAWING TITLE		CLIENT	ADCO	PRELIMINARY
	4		19/11/21	FOR COORDINATION			TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE		CONCEPT TRAFFIC GUIDANCE SCHEME		DRAWING #	TGS-005	
	3		11/11/21	FOR COORDINATION			KING ST / FOURTH AVENUE / SECOND AVE				PROJECT #	21-3317	
	P1		07/11/21	Option 1 Assessment							SCALE	1 : 1000 @ A3	REV P4



comments		A3	
	TfNSW Accredited Traffic Controller		Proposed TGS Signage

	Suite 502, 1 James Place North Sydney NSW 2060			PROJECT			DRAWING TITLE		PRELIMINARY		
	TAFE NSW CONSTRUCTION CENTRE OF EXCELLENCE					CONCEPT TRAFFIC GUIDANCE SCHEME		CLIENT		ADCO	
REV DATE COMMENT / DESCRIPTION			DRAWN		REVIEWED		DRAWING #		PROJECT #		
							TGS-006		21-3317		
4 19/11/21 FOR COORDINATION			HL		SW						
3 11/11/21 FOR COORDINATION			HL		SW						
P2 09/11/21 FOR COORDINATION			HL		SW						
P1 01/11/21 Option 1 Assessment			SW		SW				SCALE 1 : 1000 @ A3		



APPENDIX E
ADCO- DRIVER CODE OF CONDUCT

DOCUMENT TITLE	TRAFFIC MANAGEMENT PLAN
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Other Considerations

- **Speed Limits** – All heavy vehicle drivers are to obey the posted speed limits, within or outside of the construction site. Keep in mind that there are changes in traffic conditions and altered speed limits are posted on approach to the site;
- **Driver Fatigue** – Driver fatigue is a road safety hazard and one of the biggest causes of accidents especially for heavy vehicle drivers. All drivers have a duty to not drive a vehicle while impaired by fatigue.
- **Covering Loads** – TfNSW requires all load covers to secure and contain all materials within the vehicle and trailer;
- **Heavy Vehicle Interval** – To increase road safety, heavy vehicles leaving the construction site should be separated, as far as practicable, a minimum of a 10-minute interval;
- **Vehicle Breakdowns** – In the case of a breakdown, the vehicle must be towed to the nearest breakdown point as soon as possible and reported to the Service NSW Transport Management Centre (131 700).
- **Site Access** – Vehicles shall enter and exit the site in a forward direction.
- **Drugs and Alcohol** – Drivers must not be under the influence of any illicit drugs, alcohol or medication which may impair their ability to operate a vehicle. Drivers will be randomly tested for drugs and alcohol.

Hours of Work

All work associated with the project will be restricted to the permitted working hours as defined in the CTMP:

Monday to Friday	7:00am to 6:00pm
Saturday	7:00am to 5:00pm
Sunday/Public Holiday	No works

Emergency Contact Numbers

Service NSW Transport Management Centre
131 700

Penrith City Council
(02) 4732 7777

ADCO Constructions Project Manager
Pierce Brennan
0419 422 566

ADCO Constructions Sydney
02 8437 5000

All other Emergencies
000



TAFE NSW
Institute of Applied Technology
for Construction (IATC)
Nepean Kingswood Campus

Driver Code of Conduct

This Driver Code of Conduct applies to all personnel and any other person conducting business for the TAFE NSW IATC whether a direct employee of ADCO Constructions or employed by some other organisation providing service or working with ADCO Constructions.

General Requirements

- As a driver you are required to know and comply with all the road rules pertaining to your vehicle;
- You are expected to hold a valid driver's licence for the class of the vehicle you are operating;
- Undertake a site induction carried out by an approved member of the construction staff or suitably qualified person;
- Participate in regular toolbox meetings with appropriate and qualified person;
- Promote road safety and obey all NSW Road Rules; and
- You are to operate the vehicle in a safe manner within and outside the construction site and comply with the direction of authorised site personnel while inside the site.

Truck Routes

Heavy vehicle drivers are to carefully plan their routes so that state and regional roads are given priority for route selection, keeping in mind the certain restrictions during particular times of the day.



-  TAFE NSW Nepean Kingswood Campus Boundary
-  IATC Site
-  Proposed Works Zone
-  Access Route
-  Egress Route



APPENDIX F

DOUGLAS PARTNERS- GEOTECHNICAL INVESTIGATION

DOCUMENT TITLE	TRAFFIC MANAGEMENT PLAN
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Douglas Partners
Geotechnics | Environment | Groundwater

Report on
Geotechnical Assessment

Proposed Haul Road
Western Sydney University, Werrington South
Campus, Werrington

Prepared for
TAFE NSW

Project 203407.00
July 2021

Integrated Practical Solutions



Document History

Document details

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Report prepared for	TAFE NSW		
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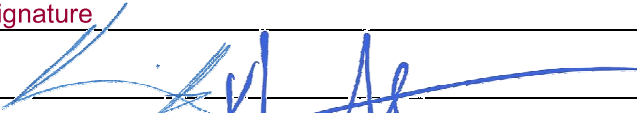
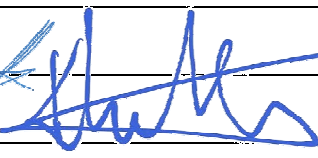
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Status	Prepared by	Reviewed by	Date issued
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Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1		Priya Mekala, TAFE NSW

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 	26 Jul. 21
Reviewer 	26 Jul. 21



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Executive Summary

This report presents the results of a geotechnical assessment undertaken for a proposed haul road route at Western Sydney University, Werrington South Campus, Werrington. The investigation was commissioned in an email 28 April 2021 by Priya Mekala on behalf of TAFE NSW and was undertaken in accordance with Douglas Partners Pty Ltd (DP) proposal 203407.00.P.001 dated 31 March 2021.

It is understood that an assessment is required to survey the existing roadways within the WSU campus to better understand their suitability to support construction traffic for the duration of the proposed construction of an educational facility at the adjacent TAFE Nepean Kingswood Campus.

The proposed route within the campus (shown in Figure 1) is about 3.1 km in length and comprises the following:

- Inbound – First and Third Avenue and King Street from Third Avenue to the site. Includes two lanes at the junction of First Avenue and Great Western Highway; and,
- Outbound Option 1 – King Street, Fourth Avenue, Unnamed Road and First Avenue. Single lane from site to the Great Western Highway. Includes right hand turning lane at the junction of First Avenue and Great Western Highway.
- Outbound Option 2 – King Street, Second, Ninth and First Avenues. Single lane from site to the Great Western Highway. Includes left hand turning lane at the junction of First Avenue and Great Western Highway.

The investigation included a road condition assessment and deflection testing of relevant parts of the road, together with boreholes and laboratory testing of selected samples. Benkelman beam testing involved the measurement of pavement deflections under an 8 tonne standardised axle load and prescribed tyre pressure of 550 kPa. Pavement deflections were measured at wheel distances of 0 mm, 200 mm and 9 m from the test location, with tests undertaken at 20 m intervals in the selected lanes (where accessible for testing), in alternating wheel paths.

The assessment indicates that the existing structural layers and subgrade are able to support the increased traffic loading over the remainder of the pavements design life. The inbound option together with Option 1 outbound would prove to be the best haul route option, however, the additional construction traffic will exacerbate the existing damage and routine repairs at localised areas, together with normal ongoing maintenance, will likely be required with the intention to make final changes following a post dilapidation assessment after construction has been complete. Higher risk areas have been identified and tabulated in Appendix D of this report.

Following construction, the design life could be extended if other measures, such as the application of an overlay were undertaken. In conclusion, the assessment suggests that the existing pavement requires ongoing maintenance, although is generally in a condition that can support the increased traffic loadings over the remainder of its design life (i.e. the short term).

Report on Geotechnical Assessment

Proposed Haul Road

Western Sydney University, Werrington South Campus, Werrington

1. Introduction

This report presents the results of a geotechnical assessment undertaken for a proposed haul road at Western Sydney University, Werrington South Campus, Werrington. The investigation was commissioned in an email 28 April 2021 by Priya Mekala on behalf of TAFE NSW and was undertaken in accordance with Douglas Partners Pty Ltd (DP) proposal 203407.00.P.001 dated 31 March 2021.

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The proposed route within the campus (shown in Figure 1) is a about 3.1 km in length and comprises the following:

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The investigation included a road condition assessment and deflection testing of relevant parts of the road, together with boreholes and laboratory testing of selected samples. The details of the field work are presented in this report, together with comments and recommendations on the issues listed above.

2. Desktop Study

The following reports were reviewed for this assessment:

- Geotechnical report PSM4240-004I Rev2 dated 5 February 2021 prepared by Pells Sullivan Meynink (PSM). Borehole located near the subject site recorded a CBR of 3%;
- Preliminary construction traffic and pedestrian management plan (Preliminary CTPMP, Reference 20.456r03v03 dated March 2021) prepared by Traffix.

Reference to preliminary construction traffic and pedestrian management plan (Preliminary CTPMP, Reference 20.456r03v03 dated March 2021) prepared by Traffix indicates the construction of the new building will take approximately 77 weeks. Trucks accessing the site during this period are understood

to include 12.5 m long heavy rigid vehicles, 19.6 m long truck and dog trailers and 19 m long articulated vehicles. A break down for assessment of heavy vehicle movements is summarised below:

- **Site establishment stage:** 6 weeks period. Max size truck will be 12.5 m long Heavy Road Vehicle (HRV). Max four trucks per day (in, out);
- **Bulk Excavation Stage:** 6 weeks. 19.6 m truck and dog. 40 trucks per day. Following recent discussions, it is understood the earthworks program carried out using site won material and no surplus is expected. Therefore, it is expected that heavy vehicle traffic movements are unlikely to be this based on the estimation above. Notwithstanding this, it would be prudent to suggest that for the purpose of this assessment the traffic loading should be based on the stated traffic movements as a conservative measure; and,
- **Construction Stage:** 65 weeks. Max sized truck will be 19 m long articulated vehicles. Max 10 trucks per day.

Review of aerial imagery indicated that the internal roads had been constructed before 2002 which may suggest that the roads are nearing the end of their design life. Construction for the unnamed road appeared to be carried out at the beginning of 2014 suggesting it may be 7 years into its design life. No records of design were provided to DP at the time of this assessment therefore we cannot determine whether or not the pavement was designed for 20 year or 40 year design life.

3. Site Description

The proposed haul road is located within the Werrington University Campus. The pavement alignment is curved and passes through slightly undulating and hilly terrain within a rural residential setting. The site and proposed haul routes are shown in drawings 1 and 2 in Appendix B.

The subject length of the road is typically a two-lane section of asphaltic-concrete (AC) surfaced road.

The site falls moderately to the east down to generally flat terrain. Several roads have been constructed into the natural formation with First Avenue and Unnamed road appearing to have been raised on fill.

The roundabout surface at First and Third Avenue and Third Avenue and King Street were generally in a poor condition, with several defects observed during the walkover of the roundabout and the approach lanes. Surface defects around the roundabout comprised crocodile cracking, meandering cracks and some delamination.

Surface drainage is generally discharged away from the road using the naturally graded slope where no kerb and gutters are formed. Localised areas control surface drainage by either kerb and gutters, swales or through piped culverts, mainly along First Avenue.

Further notes on the condition of the paved areas outlined above are included in the pavement condition observations in Section 8.2.

4. Regional Mapping

Reference to Penrith 1:100 000 Soils Landscape Sheet indicates the site is underlain by Luddenham erosional landscape which is characterised by undulating to rolling low hills on Wianamatta Group shales, often associated with Minchinbury Sandstone. Soils are typically moderately deep (<150 cm) yellow Podzolic soils and Prairie soils on lower slopes and drainage lines.

Reference to the Penrith 1:100 000 Geology Sheet indicates the site is underlain by Wianamatta Group Bringelly Shale Shale, typically comprising carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff.

The field work confirmed the presence of clay soils, with bedrock encountered in some test locations along the road alignment. Pavement and fill materials were also encountered to various depths along the road alignment.

5. Field Work Methods

The field work was conducted between 1 June and 4 June 2021 in the presence of a geotechnical engineer from DP. The investigation included a walkover assessment noting signs of deformation and distress within the existing lanes along the haul road alignment. Fixed chainages were set out along the proposed route to allow reference and location of test results. Photographs were taken of the existing pavement surface conditions and are included in Appendix C.

Benkelman beam testing was undertaken on 1 June 2021 for the haul road alignments. Benkelman beam tests involve the measurement of pavement deflections under an 8 tonne standardised axle load of 80 kN and prescribed tyre pressure of 550 kPa. Pavement deflections were measured at wheel distances of 0 mm, 200 mm and 9 m from the test location, with tests undertaken at 20 m intervals in the selected lanes (where accessible for testing), in alternating wheel paths.

Based on the results of the visual assessment and Benkelman beam testing, borehole locations were chosen along the internal roads. The location of boreholes were targeted to areas of both observed pavement distress and apparent sound pavement.

The investigation carried out on 2 June 2021 and 4 June 2021 included the drilling of nine pavement bores (Boreholes BH1 to BH9) using a track mounted excavator attached with a 300 mm diameter solid flight auger. Boreholes were drilled to termination depths in the range of 1 m to 1.1 m. BH2 and BH9 reached auger refusal depths of 0.6m and 0.1 m, due to obstructions.

Dynamic cone penetrometer (DCP) tests were undertaken within bores (BH1 to BH8) to assess the insitu strength and consistency of subgrade soils.

The boreholes were logged and sampled by a geotechnical engineer. Bulk soil samples were collected from the boreholes at subgrade level for subsequent laboratory analysis.

Boreholes were backfilled immediately upon completion with auger cuttings, granular backfill and sand-cement mix and topped cold mix asphalt. Compaction of backfilled materials was achieved using a steel tamping rod.

The locations of the bores are shown on Drawing 1 in Appendix B. Location coordinates and ground surface levels at the top of each pavement bore were measured using a differential global positioning system (dGPS) receiver. Coordinates and levels are shown on the log sheets in Appendix D.

6. Field Work Results

6.1 Visual Assessment

The detailed results of the field work are provided in Appendix D, with selected photographs included in Appendix B. The results of the pavement condition survey have been summarised in the site description, previously. A summary of the results of the remaining field work is provided in the following sections.

6.2 Benkelman Beam Tests

The Benkelman Beam measures rebound deflection of the pavement under a 'standard' 8.2 tonne single axle with dual tyre (SADT) with measurement of deflection taken on both the left and right wheel paths at alternating 20 m spacings whilst the truck is in motion. Benkelman beam deflection testing was carried out using DP's Benkelman beam and a calibrated beam truck supplied by Ground Technologies. The detailed results of the beam testing are included in Appendix C and are summarised in Tables 1 and 2.

Table 1: Summary of Benkelman Beam Deflection Testing (South Campus)

Chainage	Lane	No. Tests	Range of Deflections (mm)	Characteristic Deflection (mm)	Range of Curvatures (mm)	Characteristic Curvature (mm)
First Avenue	NB	8	0 – 0.7	0.72	0 – 0.3	0.11
First Avenue	SB	37	0.06 – 0.5	0.41	0 – 0.18	0.04
First and Third Ave Roundabout	-	3	0.58 – 2.38	2.87	0.22 – 1.18	0.61
Third Avenue	WB	11	0.04 - 0.84	0.89	0 - 0.2	0.09
King Avenue	NB	36	0.1 – 1.0	0.83	0 – 0.38	0.10
Unnamed Road	EB	19	0 – 0.66	0.57	0 – 0.16	0.05

Table 2: Summary of Benkelman Beam Deflection Testing (North Campus)

Chainage	Lane	No. Tests	Range of Deflections (mm)	Characteristic Deflection (mm)	Range of Curvatures (mm)	Characteristic Curvature (mm)
Second Avenue	NB	13	0.34 – 0.98	1.04	0.06 – 0.36	0.16

Chainage	Lane	No. Tests	Range of Deflections (mm)	Characteristic Deflection (mm)	Range of Curvatures (mm)	Characteristic Curvature (mm)
Ninth Avenue	EB	14	0.10 – 0.96	0.89	0.02 – 0.38	0.19
First Avenue	SB	8	0.02 – 0.46	0.58	0 – 0.18	0.05

6.3 Boreholes

The subsurface conditions encountered in the boreholes during drilling are presented in the attached borehole logs provided in Appendix D, along with notes explaining classification methods and defining descriptive terms used in preparation of the logs.

The general subsurface profile encountered is summarised below:

PAVEMENT	– Asphaltic concrete (AC) encountered within all lanes and road shoulders. The total thickness of the AC ranged between 30 mm and 100 mm, where encountered. The AC generally consisted of aggregate with sizes up to about 14 mm; overlying, – Sandy gravel, possibly DGB, consisting of fine to coarse angular gravel, apparently moderately compacted. The total thickness of the road base ranged between 120 mm and 540 mm, where encountered;
FILL	– Filling typically comprised clay of low to medium plasticity, apparently in stiff condition;
NATURAL	– Low to high plasticity clay, generally stiff to very stiff consistency; underlain by,
ROCK	– BH05 encountered sandstone bedrock at depth 0.8 m. Refusal depths ranged between 0.7 m to 0.8 m.

6.4 Existing Pavement Thickness

The ranges of thicknesses and depths to the top of each layer, as measured in the boreholes, are presented in Tables 3 and 4.

Table 3: Interpreted Strata Layer Thicknesses

Strata Layer	Layer Thickness (m)								
	BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8	BH9
Asphalt	0.03	0.06	0.03	0.04	0.03	0.05	0.04	0.02	0.1
Basecourse	0.37	0.54	0.37	0.36	0.12	0.45	0.31	0.23	-
Subbase	-	-	-	-	0.20	-	-	-	-
Fill/ Sandy Gravel		0.05	-	-	-	-			-

Strata Layer	Layer Thickness (m)								
	BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8	BH9
Fill/Sandy Clay or Silty Clay	0.7	-	-	-	-	-	0.75	0.75	-
Natural Clay	-	-	0.7	0.7	0.45	0.6	-	-	-
Bedrock	-	-	-	-	0.3	-	-	-	-
Termination Depth	1.1	0.65	1.1	1.1	1.1	1.1	1.1	1	0.1

'-' Denotes, not encountered

'ND' Denotes, Not Determined

Table 4: Interpreted Depths to Top of Strata Layer

Strata Layer	Depth to Top of Layer (m)								
	BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8	BH9
Asphalt	0	0	0	0	0	0	0	0	0
Basecourse	0.03	0.06	0.03	0.04	0.03	0.05	0.04	0.02	0.1
Subbase	-	-	-	-	0.15	-	-	-	-
Fill/ Sandy Gravel	-	0.6	-	-	-	-	-	-	-
Fill/Sandy Clay or Silty Clay	0.4	-	-	-	-	-	0.35	0.25	-
Natural Clay	-	-	0.4	0.4	0.35	0.5	-	-	-
Bedrock	-	-	-	-	0.8	-	-	-	-
Termination Depth	1.1	0.65	1.1	1.1	1.1	1.1	1.1	1	0.1

'-' Denotes, not encountered

6.5 Groundwater

Groundwater was not observed in any of the boreholes during the field investigation. It should be noted that groundwater levels are transient and that fluctuations may occur in response to climatic and seasonal conditions.

7. Laboratory Testing

Five bulk soil samples were obtained from the pavement subgrades for the purpose of undertaking California bearing ratio (CBR) tests. The compaction properties of the soil samples were determined

and each sample was then prepared in a CBR mould at 100% of the Standard Maximum Dry Density (SMDD) to within 2% of the Standard Optimum Moisture Content (SOMC). Once prepared, the samples were immersed in a water tank with a 4.5 kg surcharge for a 4 day period. The results of the laboratory compaction and CBR tests are summarised in Table 5.

Table 5: Summary of Laboratory Test Results

Test No.	Depth (m)	Description ⁽¹⁾	CBR (%)	SMDD (t/m ³)	OMC (%)	FMC (%)	Swell (%)
BH1	0.4-0.6	FILL/Sandy clay	9.0	1.87	15.0	15.8	0.5
BH3	0.4-1.0	Clay	1.5	1.67	18.5	23.0	4.5
BH6	0.5-1.0	Silty clay	3.0	1.62	22.5	22.2	2.5
BH7	0.4-0.8	Clay	3.5	1.71	21.0	23.8	2.0
BH8	1.57	Sandy clay	4.0	1.57	24.0	19.5	1.5

Notes: (1) Soil descriptions are based on visual inspection

CBR - California bearing ratio

SMDD – maximum dry density

OMC – optimum moisture content

FMC = Field Moisture Content

8. Comments

8.1 Proposed Development

We understand that an assessment is required to survey the existing roadways within the WSU campus to better understand their suitability to support construction traffic for the duration of the proposed construction. It is noted that the proposed development will increase the traffic load on the pavements.

8.2 Pavement Condition

The visual assessment of the pavement indicated that the is generally in a fair to good condition with occasional areas where the pavement surface is poor. Where distress is evident on site, the types of distress include:

- Fatigue (Crocodile) cracking – occasional areas of fatigue cracking were observed in the road, most notably at the entrance to First Avenue, the roundabouts (excluding the bridge roundabout) and Second Avenue;
- Longitudinal and transverse cracking – several areas of longitudinal and transverse cracking were observed. Longitudinal cracking occurred on almost the entire length of the pavement alignment;
- Edge Break – edge break was evident along most of the road and is primarily the result of no kerb and gutter;
- Delamination – was particularly evident where the pavement comprised a two-coat bituminous seal, possibly in Ninth Avenue.

- Patches – indicating previous pavement repairs are present at isolated areas along the pavement.

While the above distress modes are present throughout the road, as is normally observed in similar types of roads, the overall condition of the road is fair to good, particularly given the age of the pavement together with the limited amount of drainage or kerb and guttering.

The results indicate relatively uniform deflection characteristics along the internal road alignment. The characteristic deflection is less than 1 mm more most of the which indicates that the pavement has some residual life, with the exception of Second Avenue which exceeded a Characteristic Deflection of 1 mm.

Notwithstanding this, it is considered that whilst deflection can be an indicator of ongoing performance, other characteristics such as existing pavement thickness (ie thickness of cover to the subgrade), pavement material quality, subgrade strength and drainage must also be considered when determining the residual life of the pavement.

8.3 Analysis of Results

In the absence of design ESA provided by the client, reference was made to Penrith City Council design guidelines for engineering work for subdivisions and development. The guidelines were first published in 1997 and amended in November 2013. Based on the guidelines it is suggested that a DESA of 5×10^5 could be assumed for a light industrial pavement.

CBR values for specific areas are shown in Table 6 below. A CBR of 3% was adopted where test results were not available, this assumption was based on results provided in the PSM. The pavement thickness obtained during the investigation was back analysed to obtain the presumptive ESAs of the existing road.

The estimated traffic loading to failure in Table 6 below measured against Figure 8.4 or Figure 12.2 in Austroads: A Guide to Pavement Technology Part 2. Figure 8.4 is applicable to design traffic of 10^5 ESA or more and Figure 12.2 is applicable to lightly trafficked roads ie less than 10^5 ESA and assumes both are surfaced with either a bituminous seal or asphalt less than 40 mm thick.

Table 6: Traffic Loading to Failure

Borehole	Location	Asphalt Thickness	Design CBR	Granular Thickness	Back Calculated Traffic Loading to Fatigue
BH1	First Avenue Entrance	30	3*	370	1.5×10^5
BH2	First Avenue	60	3	540	3×10^5
BH3	First/Third Ave Roundabout	30	1.5	370	8×10^3
BH4	King Street	40	3**	360	1.5×10^5
BH5	King Street	30	3**	320	3×10^3

Borehole	Location	Asphalt Thickness	Design CBR	Granular Thickness	Back Calculated Traffic Loading to Fatigue
BH6	Unnamed Road	50	3	450	3.5×10^5
BH7	Second Avenue	40	3.5	310	7×10^3
BH8	Ninth Avenue	20	4	230	1×10^3

* assumed a CBR value of 3% due to invariable nature of fill soils present in borehole;

** assumed a CBR value of 3% from PSM report.

8.4 Current serviceability

The test results show that the upper bound deflection values, with some exceptions, range between 0.6 mm to 0.9 mm, while the characteristic deflections (i.e. average deflection + standard deviations times the probability of the characteristic value not being exceeded by the individual value) for are generally 0.05 mm and 0.11 mm respectively. The above deflection values include the total deflection measured within the pavement layers and at the top of the underlying subgrade, whereas the curvature values provide an indication as to where the bulk of the deflection is occurring. The relatively low curvature values of the pavement (characteristic curvatures of 0.05 to 0.11), with the exception of some areas, suggest that the upper pavement layers (i.e. the basecourse and sub-base layers) are still relatively stiff and performing as required and there is some life in the pavement. In summary, while some higher deflection and curvature readings have been recorded, the test results generally indicate that some areas will require maintenance, whilst the overall performance of the pavement should be adequate for the existing usage during construction.

Notwithstanding this, the additional construction traffic will exacerbate the existing damage and routine maintenance will be required with the intention to make final changes following a post dilapidation assessment after construction has been complete. Areas of greater risk are highlighted in the results of the visual assessment in Appendix D and are shown on Drawing 2 in Appendix B.

8.5 Possible Causes of Existing Distress

The areas of distress on the pavement are predominantly occurring through surficial wear, water softening and possible occasional structural overloading.

The surficial wear of the pavement is evident through the fatigue of the wearing surface as well as the edge break along the length of the pavement. These failure mechanisms are suspected to be a result of age, fatigue and poor drainage.

It is suspected that moisture seepage into the pavement layers and through the pavement to the underlying subgrade is occurring at some locations. Increased moisture contents within the pavement and subgrade gradually weakens the pavement and results in its overstressing and permanent deformation. Most of the defects on site are suspected to have moisture infiltration as a primary cause.

Structural overloading could also be a failure mechanism at some locations, however, most of the defects that could be attributed to structural overloading appear to be a result of the tolerable in-service loads progressively decreasing as pavement strength decreases (i.e. due to cracking) rather than the loads being too great for the given pavement cross section. Other forms of distress including potholing and patching are considered to be secondary modes of distress that have been caused by the primary distress mode outlined above. Generally, the wearing surface life is significantly less than the life of other pavement layers.

8.6 Impact of Increased Traffic

Traffic from the proposed construction haulage, will increase the loading on the pavement. It is expected that the additional traffic loading during construction will probably be in the order of 5×10^4 ESAs. Traffic loads were based on Class 6, Class 9 and Class 10 heavy vehicles. It is recommended construction traffic should be limited to the loads of the heavy vehicles specific in the Traffix Report report. By way of example, a fully loaded truck and dog combination must not exceed 42.5 tonnes (to a maximum of 50 tonnes). Reference should be made to relevant standards.

Reference to Austroads 2019 indicates that for the traffic loadings above, Equivalent Standard Axle (ESA), the maximum allowable deflection is 1.27 mm. Accordingly, as the measured characteristic deflection (ie 0.41 mm to 1.04 mm) is less than the maximum allowable deflection, the pavement has residual life to accommodate the projected traffic loading when assessed solely in terms of deflection. Notwithstanding this, it is considered that whilst deflection can be an indicator of ongoing performance, other characteristics such as existing pavement thickness (ie thickness of cover to the subgrade), pavement material quality, subgrade strength and drainage must also be considered when determining the residual life of the pavement.

The assessment indicates that the existing structural layers and subgrade are able to support the increased traffic loading over the remainder of its design life.

In conclusion, the assessment suggests that the existing pavement requires normal rectification of pavement failures, ongoing maintenance, although is generally in a condition that can support the increased traffic loadings over the remainder of its design life (i.e. the short term).

8.7 Recommendations

Based on the above, the Option 1 Haul Route may provide an overall suitable route for the period of the construction. Due to the length of the Option 1 Haul Route, an alternative path may be considered to reduce the risk of larger areas of fatigue. It may be considered that the Unnamed Road could serve as an appropriate route however 'doubling back' would likely double the design traffic loading and further reduce the design life of the existing pavement. Due to the inadequate thickness of the internal roads on the North campus it is likely that this route is not a preferred option. However the client will need to consider that most roads are, or near, what appears to be the end of their design life and some damage should be considered acceptable.

Further assessment should include a pre and post road dilapidation assessment once the final haul route is agreed upon.

Once construction is complete, the design life could be extended if other measures, such as the application of an overlay were undertaken.

9. Limitations

Douglas Partners (DP) has prepared this report for this project at Western Sydney University, Werrington in accordance with DP's proposal dated 31 March 2021 and acceptance received from Priya Mekala dated 28 April 2021. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Cadence 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.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

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 scope for work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of filling of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such filling may contain contaminants and hazardous building materials.

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

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

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


Site Photographs



Photo 1: Longitudinal/meandering cracks, previously ressealed



Photo 2: Crocodile cracking, minor patching

		Photos 1 & 2		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – south bound		Plate No: 1
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

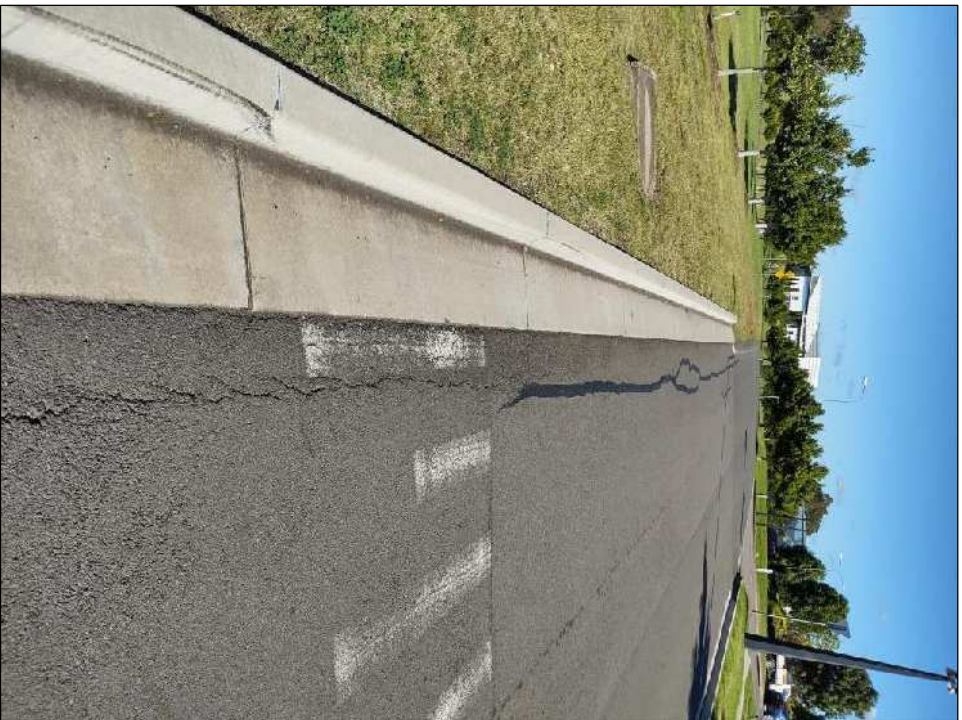


Photo 3: Longitudinal cracking in outer wheel path

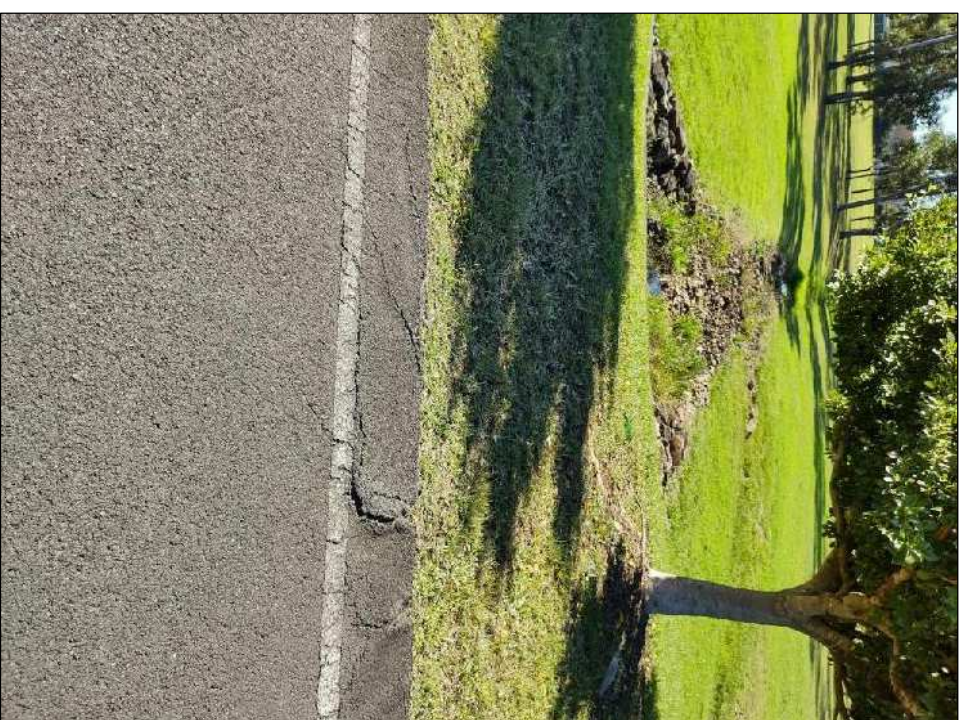



Photo 4: Near culvert? CH? Tree roots causing cracking in the fog line. -33.76797, 150.74366

		Photos 3 & 4		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – south bound		Plate No: 2
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

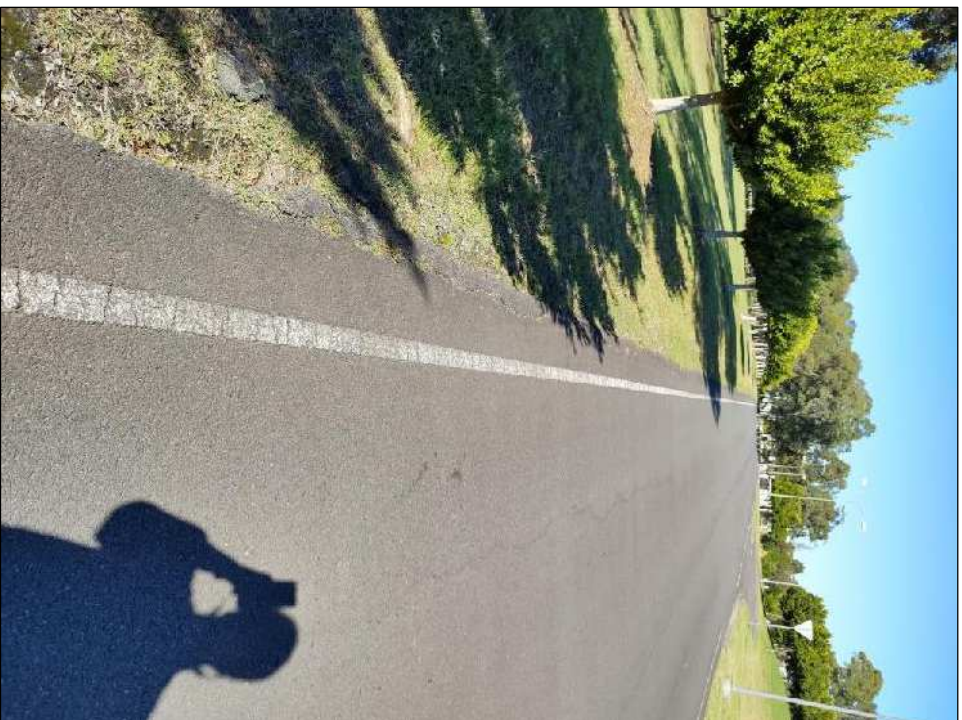


Photo 5: Photo Edge break and longitudinal cracking in pavement surface

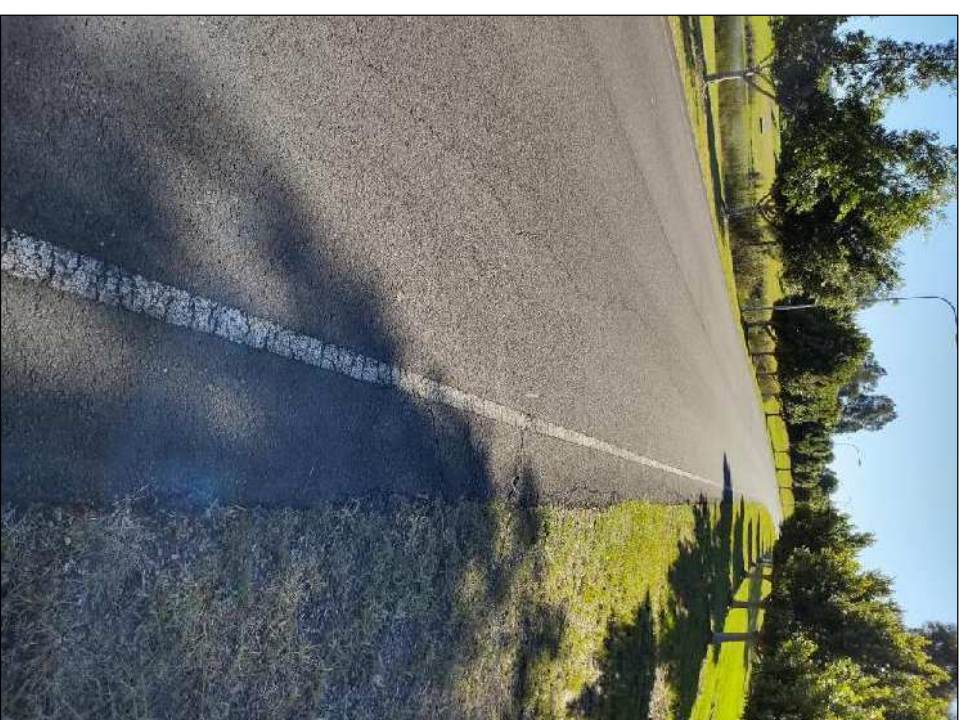



Photo 6: Longitudinal crack and edge break

		Photos 5 & 6		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – south bound		Plate No: 3
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

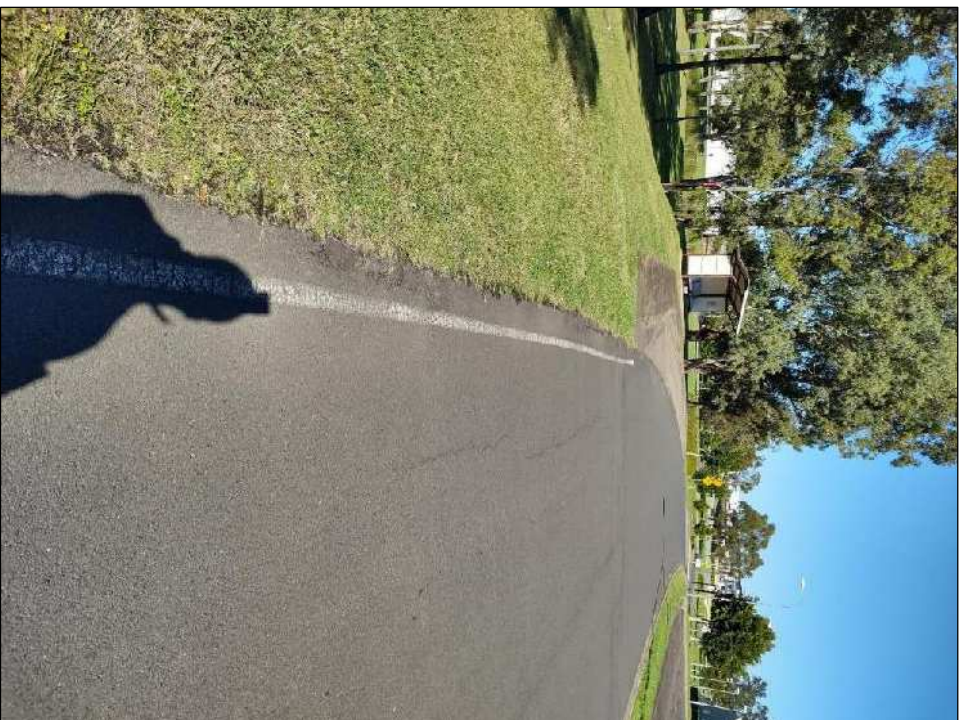


Photo 7: Longitudinal crack and edge break

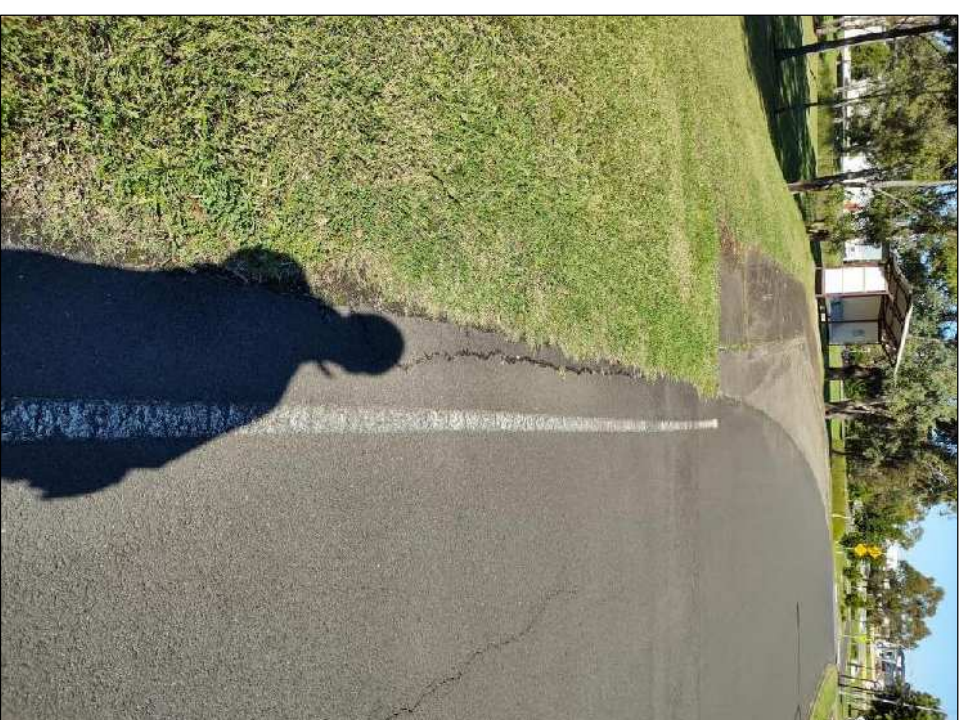


Photo 8: Longitudinal crack and edge break


		Photos 7 & 8		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – south bound		Plate No: 4
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				



Photo 9: Longitudinal crack and edge break, 1 mm



Photo 10: Edge break at construction joint between pavement types


		Client: Cadence Pty Ltd		Photos 9 & 10		Project: 203407.00	
Office: Sydney		First Ave – south bound		WSU Campus, Werrington		Plate No: 5	
Date: 10 May 2021						Revision: 0	



Photo 11: Diagonal crack through pavers

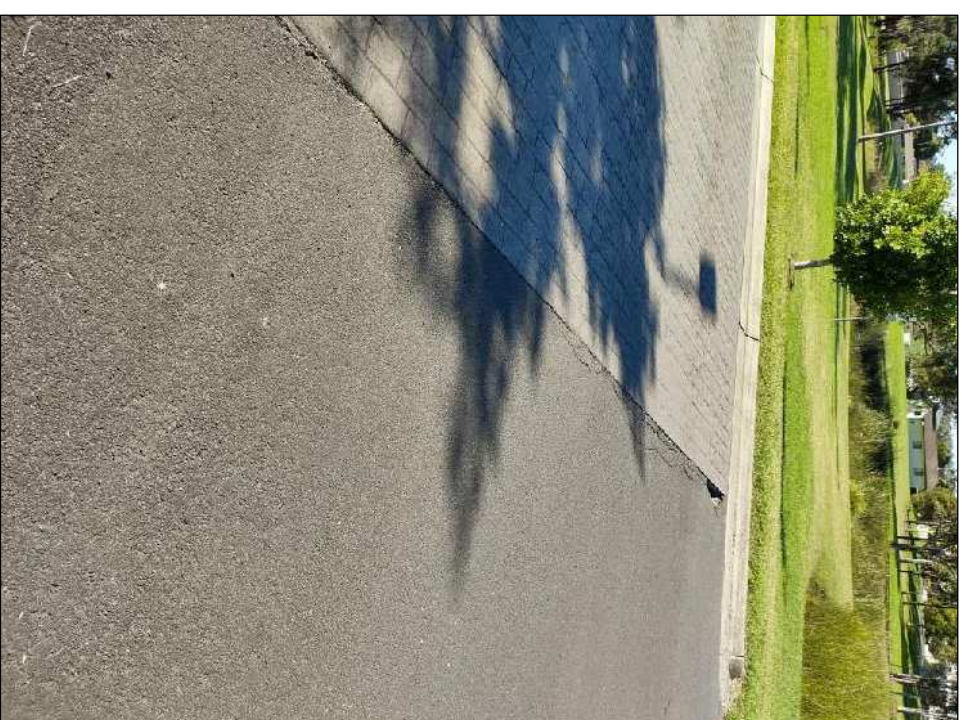



Photo 12: Edge break and localised pot hole at construction joint

		Photos 11 & 12		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – south bound		Plate No: 6
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

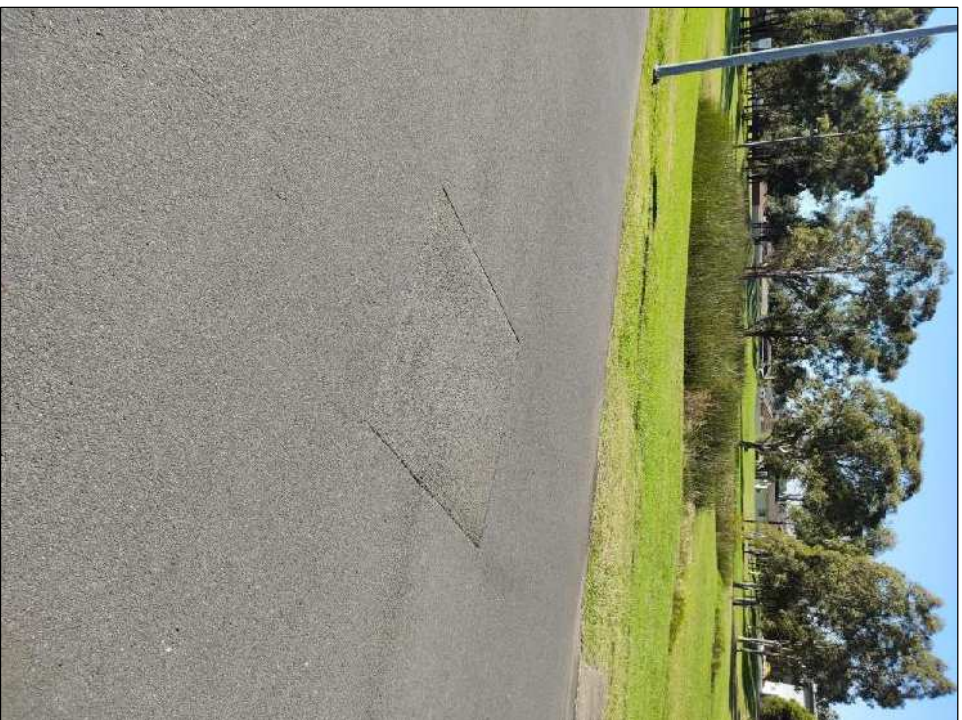


Photo 13: Patch. Small crack appearing on eastern side of patch

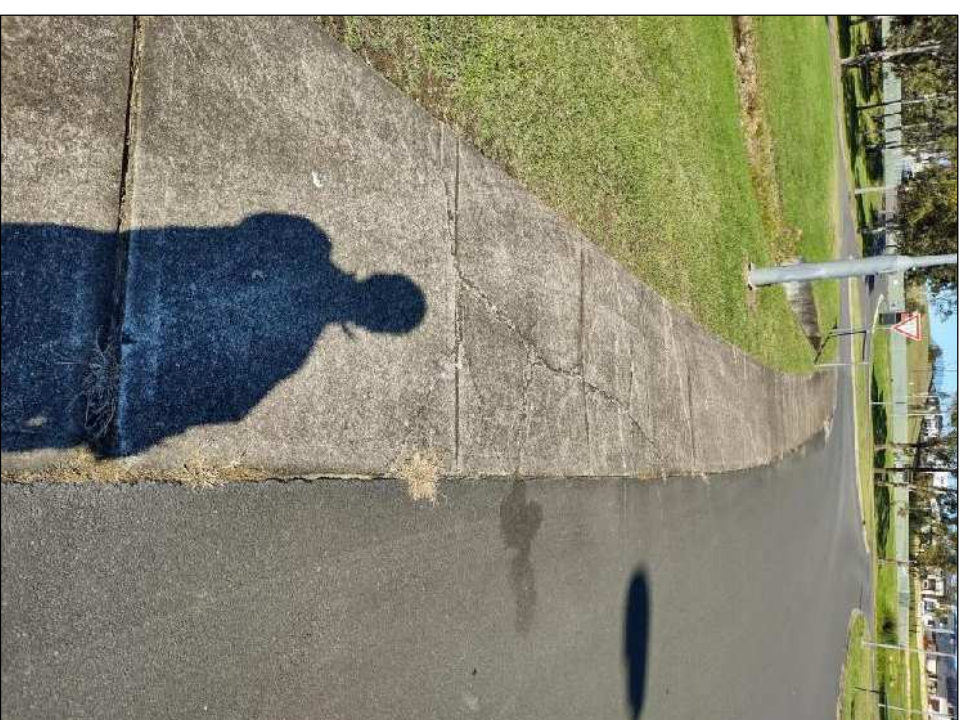



Photo 14: Significant cracking in concrete footpath

 Douglas Partners <small>Consulting Engineers & Surveyors</small>		Photos 13 & 14		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – south bound		Plate No: 7
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

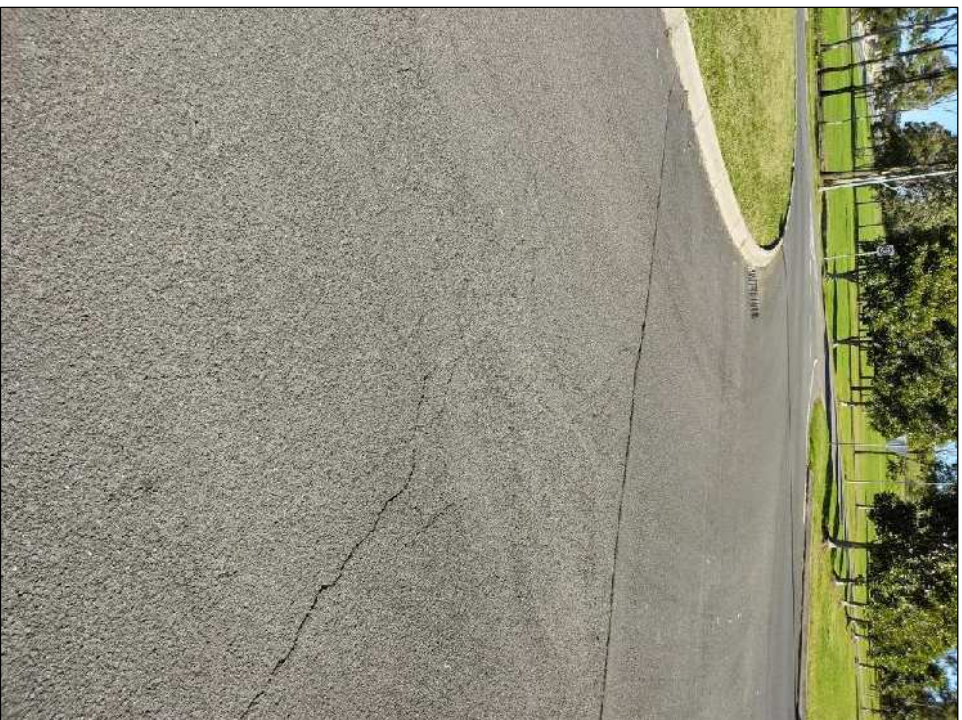


Photo 15: Crocodile cracking and diagonal cracking

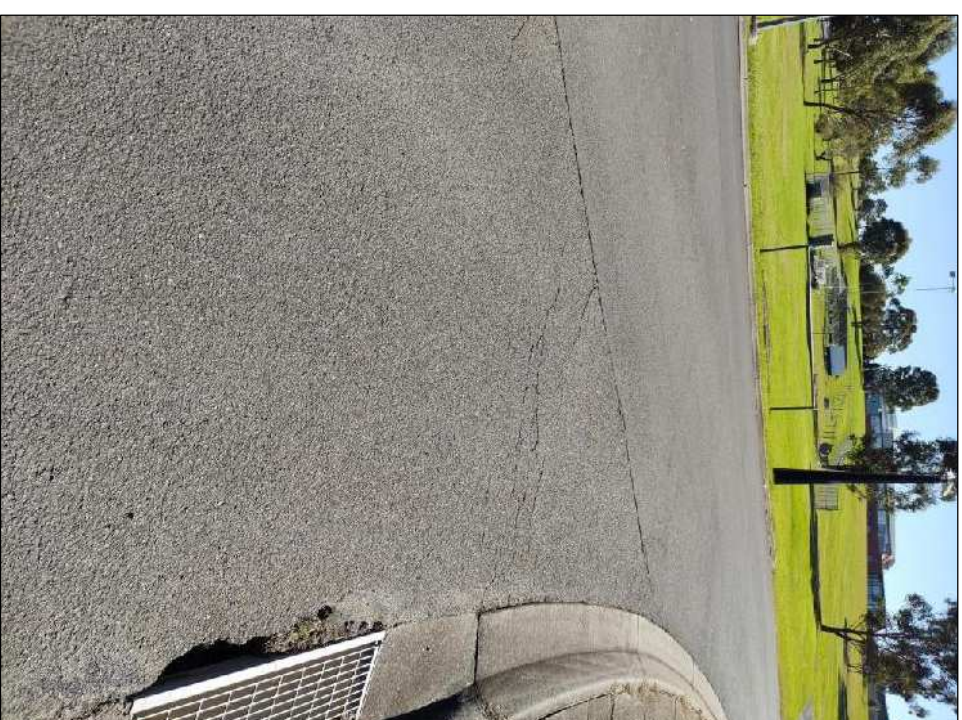


Photo 16: Edge break at stormwater;


		Photos 15 & 16		Project: 203407.00
Client: Cadence Pty Ltd		First and Third Ave		Plate No: 8
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				



Photo 17: Crocodile cracking, Rutting appearing to occur

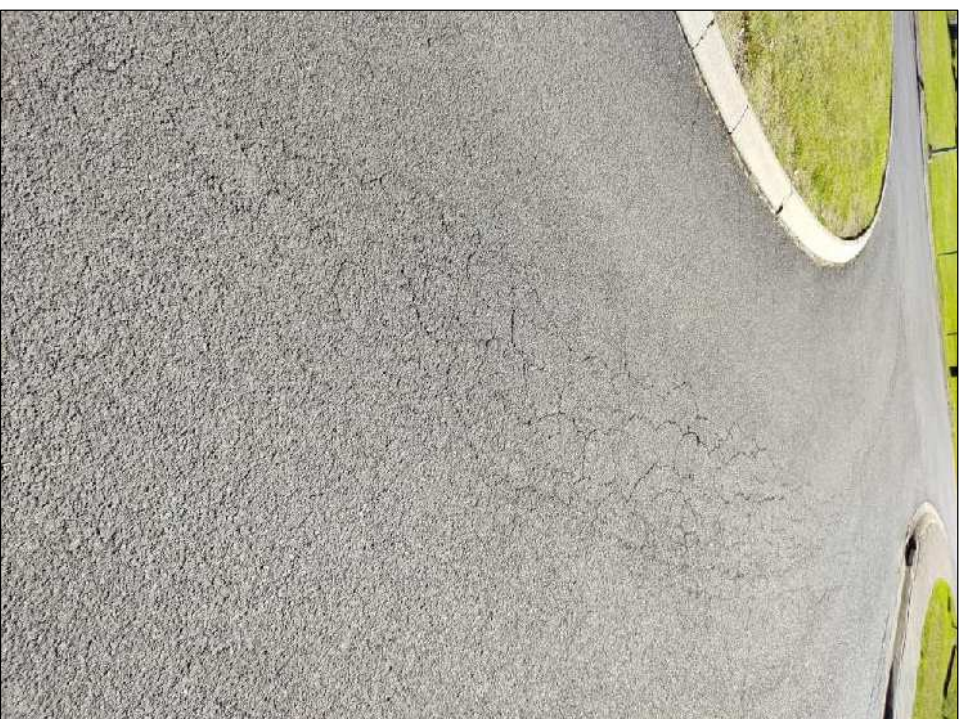


Photo 18: Crocodile cracking, Rutting appearing to occur


		Photos 17 & 18		Project: 203407.00
Client: Cadence Pty Ltd		First and Third Ave		Plate No: 9
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				



Photo 19: Crocodile cracking

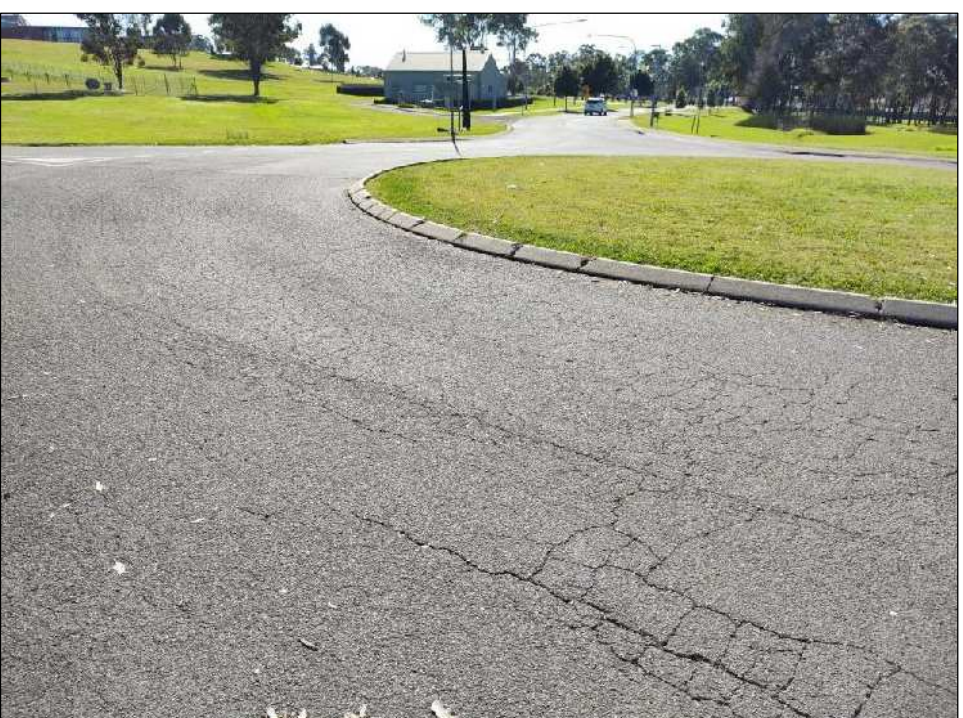


Photo 20: Significant crocodile cracking to the road surface

Client: Cadence Pty Ltd	Photos 19 & 20	Project: 203407.00
Office: Sydney	First and Third Ave	Plate No: 10
Date: 10 May 2021	WSU Campus, Werrington	Revision: 0



Photo 21: Significant crocodile cracking to the road surface



Photo 22: Longitudinal cracking



		Client: Cadence Pty Ltd	Photos 21 & 22	Project: 203407.00
Office: Sydney			First and Third Ave (Photo 21) & Third Ave (Photo 22)	Plate No: 11
Date: 10 May 2021			WSU Campus, Werrington	Revision: 0



Photo 23: Longitudinal cracking, appears to have been previously ressealed and since opened



Photo 24: Longitudinal cracking, appears to have been previously ressealed and since opened

	Client: Cadence Pty Ltd	Photos 23 & 24	Project: 203407.00
	Office: Sydney	Third Avenue (Westbound Lane)	Plate No: 12
	Date: 10 May 2021	WSU Campus, Werrington	Revision: 0

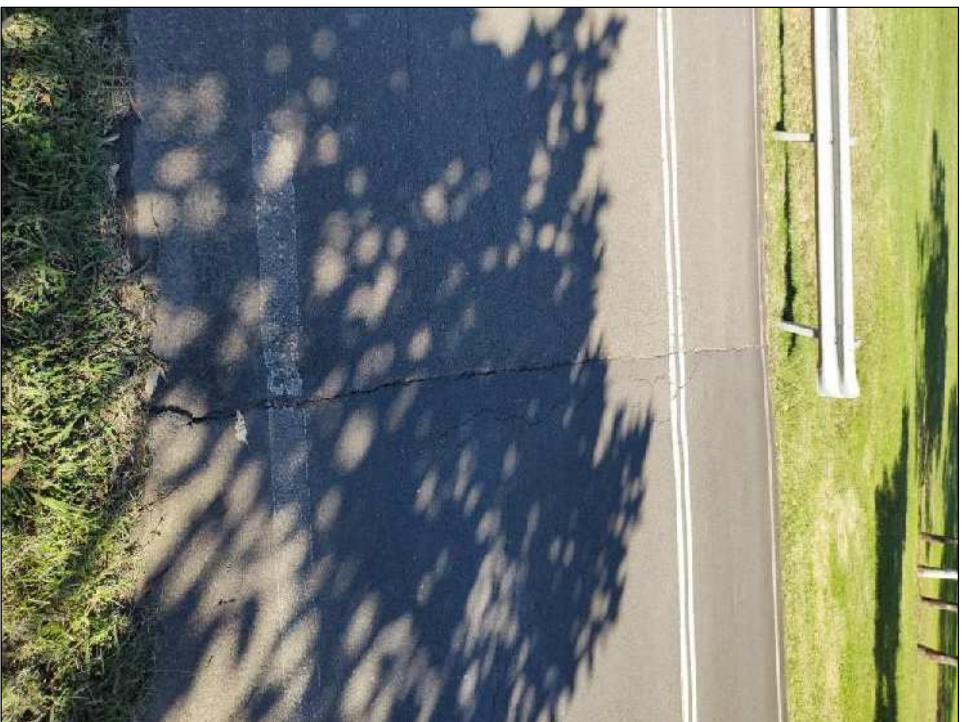


Photo 25: Horizontal and crocodile cracking at construction joint

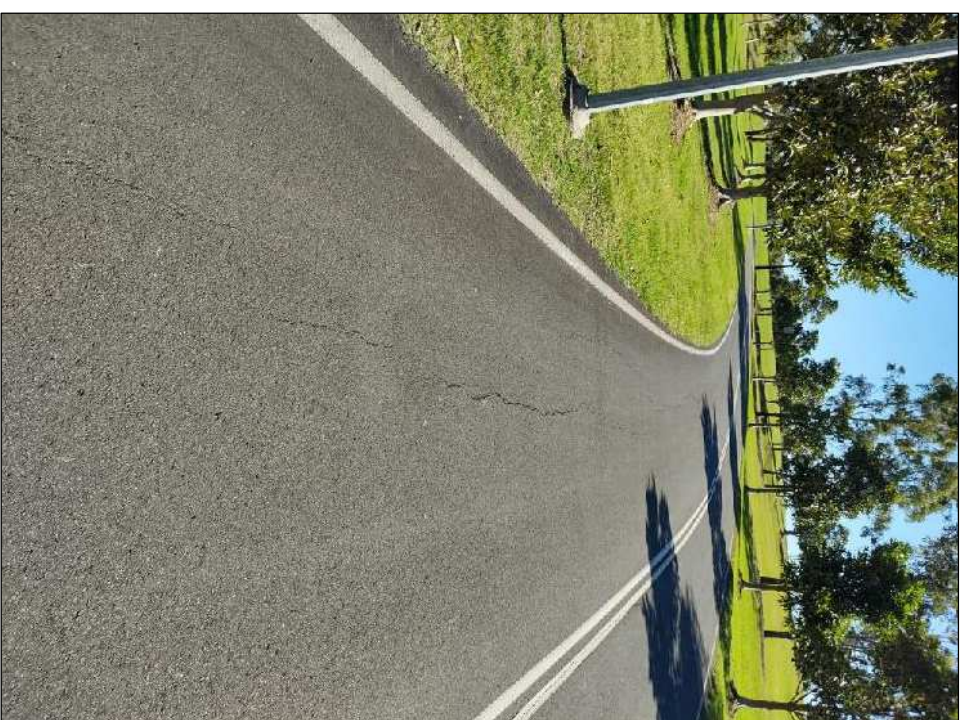



Photo 26: Longitudinal cracking in newer overlay

		Photos 25 & 26		Project: 203407.00
Client: Cadence Pty Ltd		Third Avenue (Westbound Lane)		Plate No: 13
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

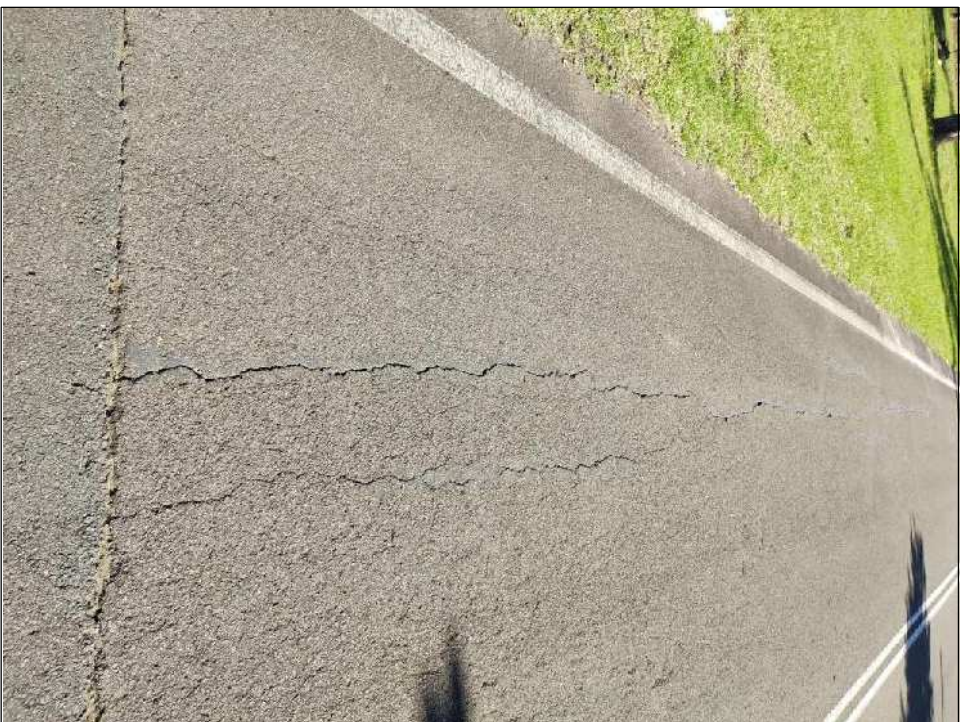


Photo 27: Horizontal crack and longitudinal cracking

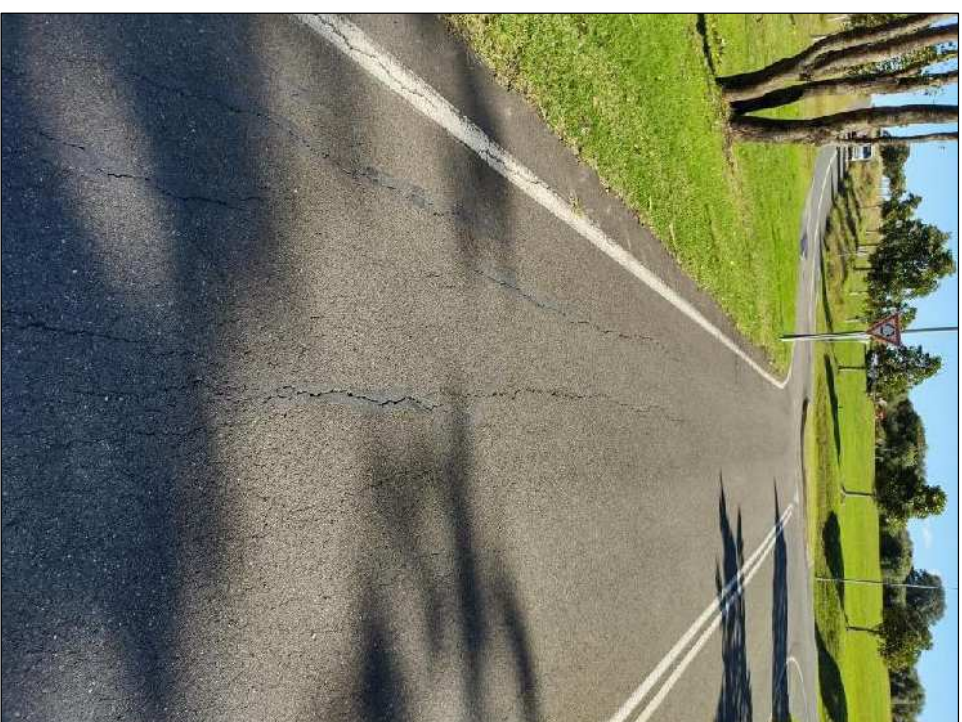



Photo 28: Longitudinal cracking which appears to have been previously sealed

 Douglas Partners <small>CONSULTANTS • ENVIRONMENTAL • ENGINEERING</small>		Photos 27 & 28		Project: 203407.00
Client: Cadence Pty Ltd		Third Avenue (Westbound Lane)		Plate No: 14
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

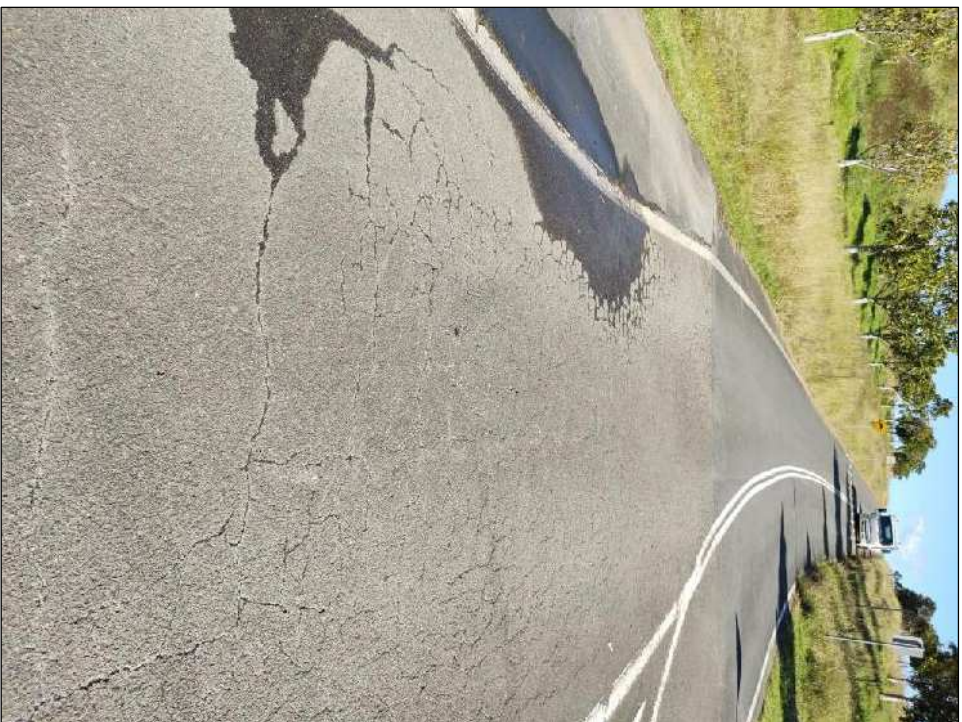


Photo 29: Crocodile cracking



Photo 30: Crocodile cracking and delamination


		Photos 29 & 30		Project: 203407.00
Client: Cadence Pty Ltd		Third Avenue and King Avenue		Plate No: 15
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				



Photo 31: Severe crocodile cracking



Photo 32: Longitudinal cracking


		Photos 31 & 32		Project: 203407.00
Client: Cadence Pty Ltd		Third Avenue and King Avenue (Photo 31) & First Ave (Photo 32)		Plate No: 16
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				



Photo 33: Crocodile cracking

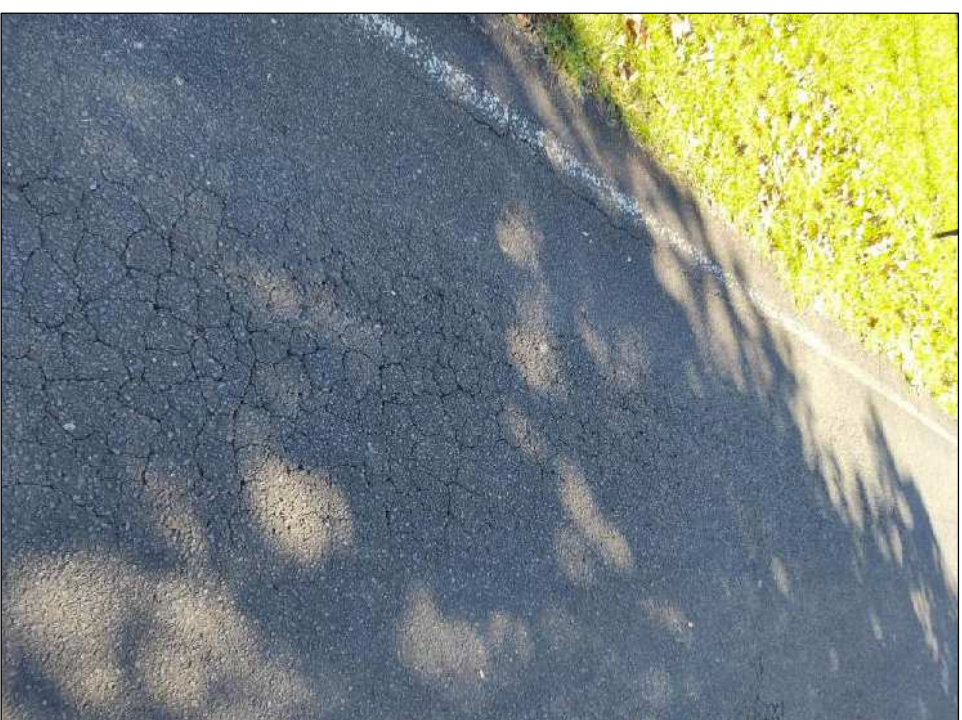


Photo 34: Crocodile cracking


			
Client: Cadence Pty Ltd		Photos 33 & 34	
Office: Sydney		First Ave – north bound	
Date: 10 May 2021		WSU Campus, Werrington	
		Project: 203407.00	
		Plate No: 17	
		Revision: 0	



Photo 35: Patchwork, service crossing

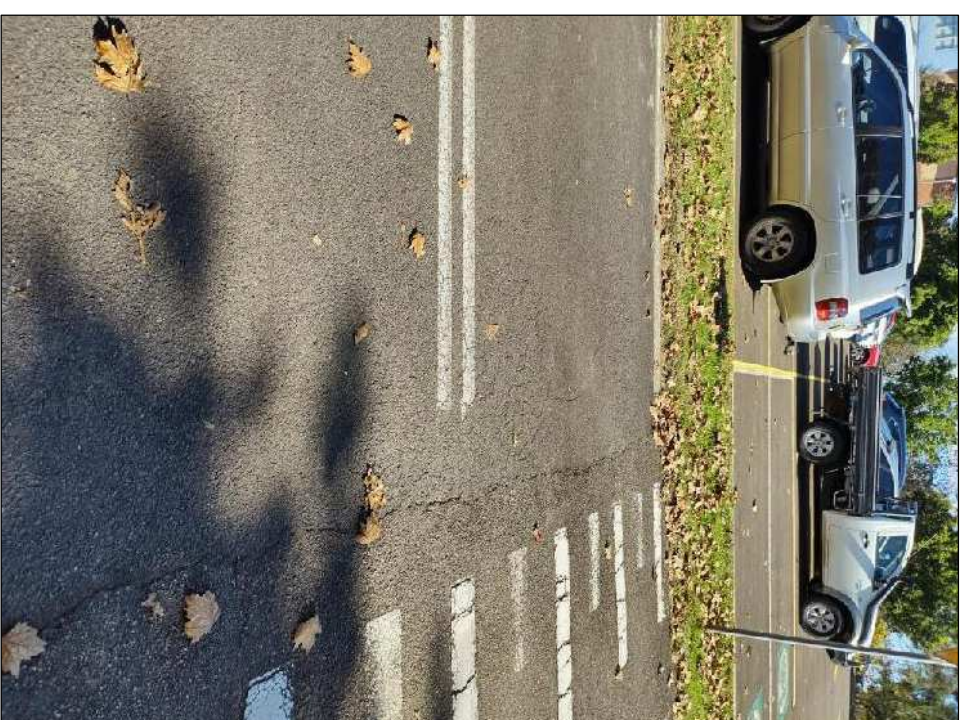


Photo 36: Crocodile cracking at the entrance/exit of the road crossing. Pothole repair also


		Photos 35 & 36		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – north bound		Plate No: 18
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				



Photo 37: Horizontal crack at junction of resealed section.
Crocodile cracking noted on the southbound side of the road

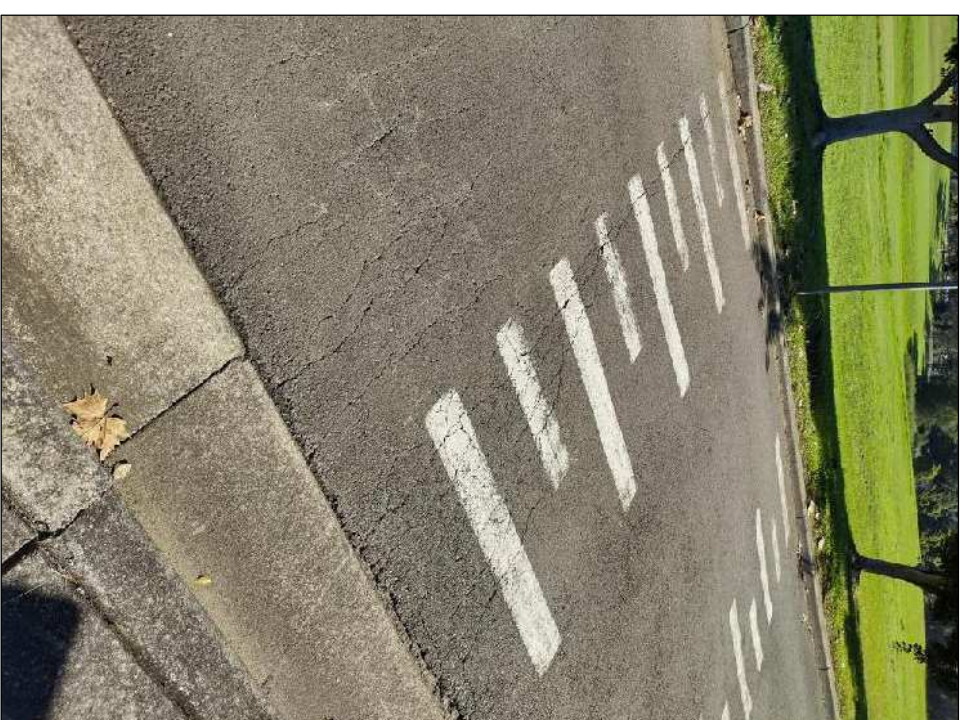



Photo 38: Transverse and crocodile cracking at crossing

 Douglas Partners <small>CONSULTANTS • ENGINEERS • ENVIRONMENTAL • EARTHQUAKE</small>			
Client: Cadence Pty Ltd	Photos 37 & 38	Project: 203407.00	
Office: Sydney	First Ave – north bound	Plate No: 19	
Date: 10 May 2021	WSU Campus, Werrington	Revision: 0	

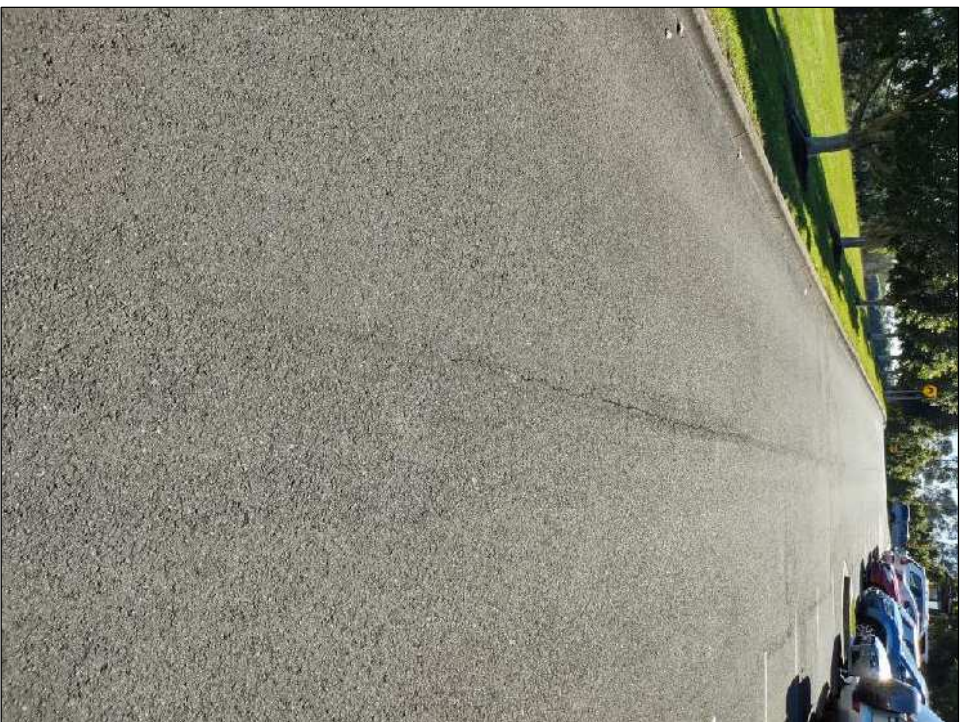


Photo 39: Longitudinal crack along centre of the road

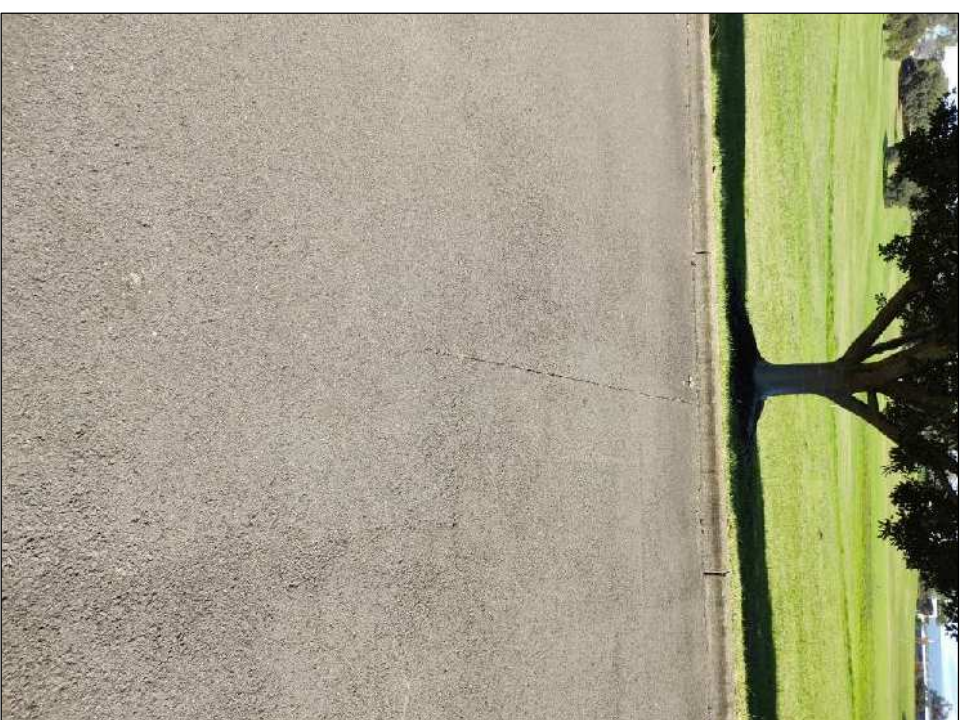



Photo 40: Transverse crack

		Photos 39 & 40		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – north bound		Plate No: 20
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

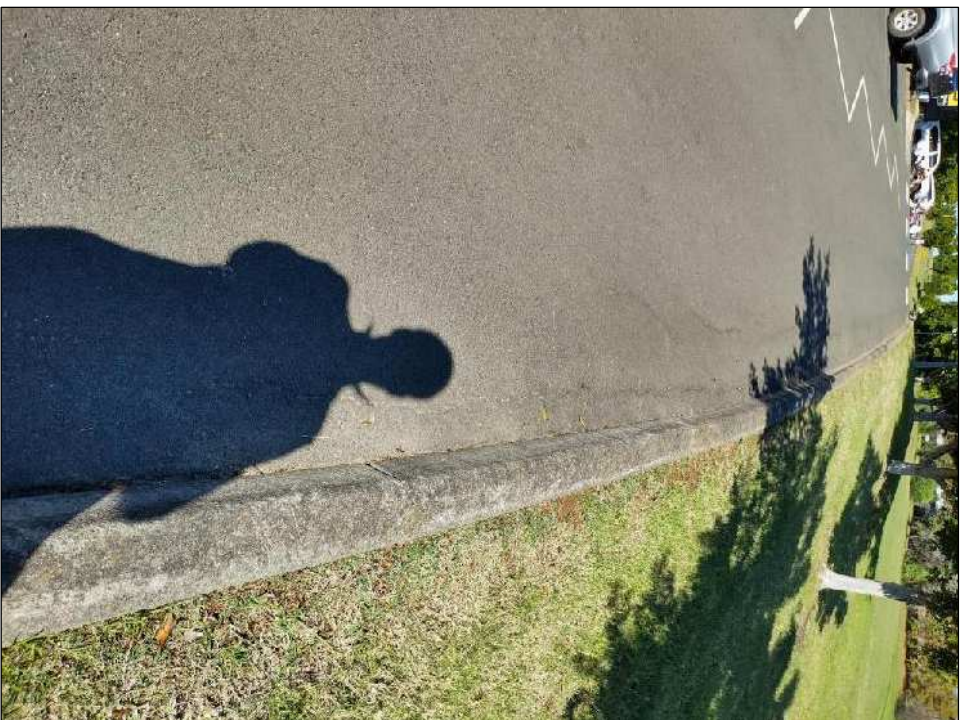


Photo 41: Longitudinal cracking

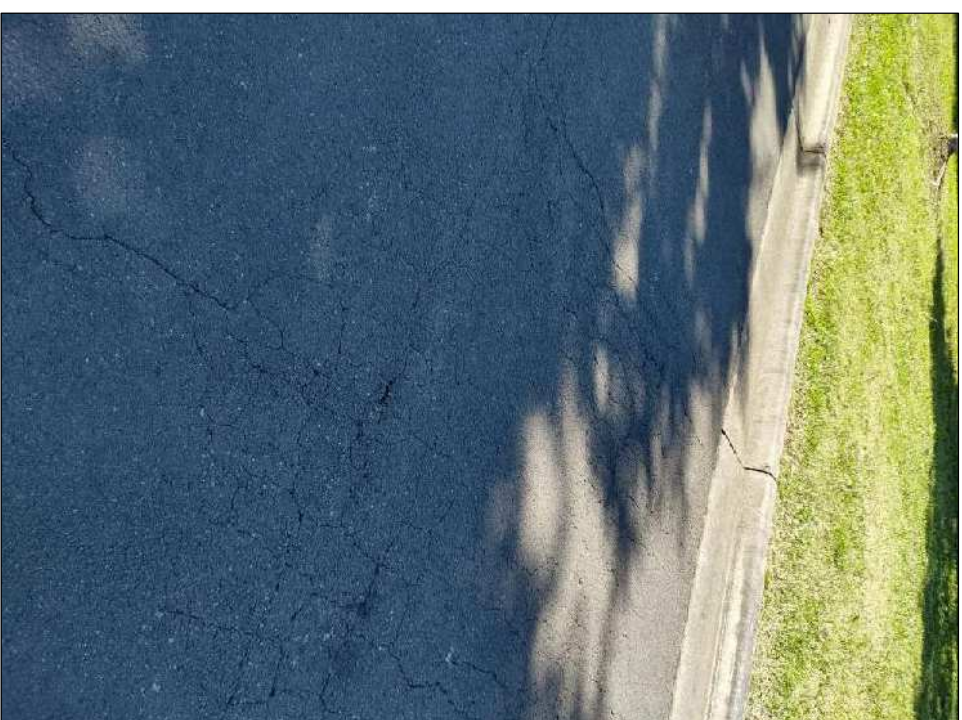


Photo 42: Transverse and crocodile cracking


	Client: Cadence Pty Ltd	Photos 41 & 42	Project: 203407.00
	Office: Sydney		Plate No: 21
	Date: 10 May 2021		Revision: 0
	WSU Campus, Werrington		



Photo 43: Edge breaks and signs of heaving/shoving??

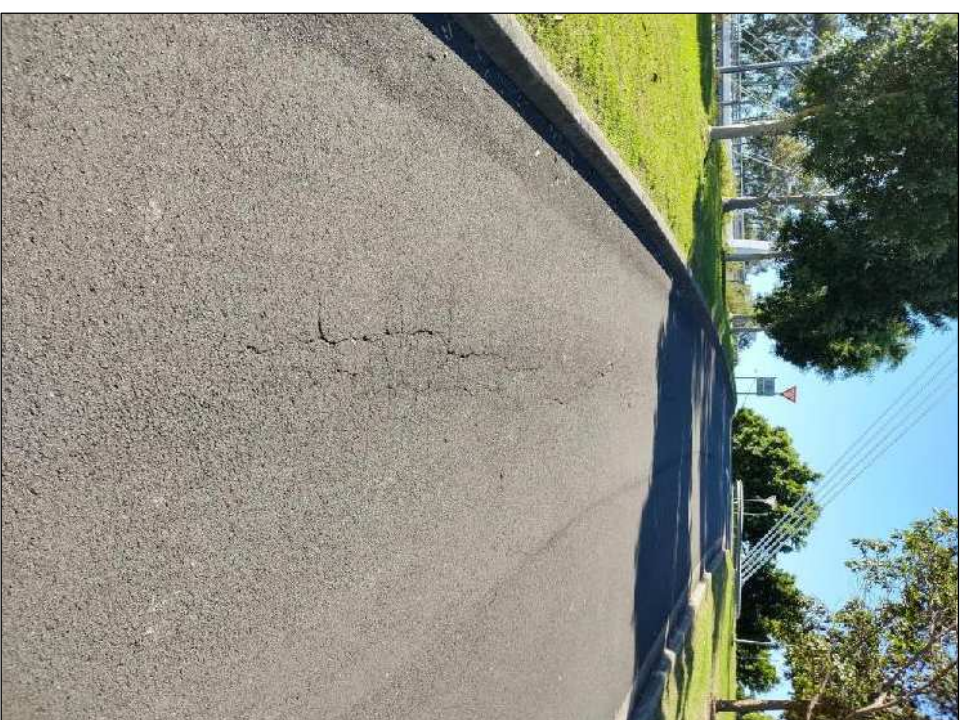


Photo 44: Crocodile Cracking


 Douglas Partners <small>Partnerships • Environment • Resources</small>		Photos 43 & 44		Project: 203407.00
Client: Cadence Pty Ltd		First Ave – north bound		Plate No: 22
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				



Photo 45: Crocodile Cracking

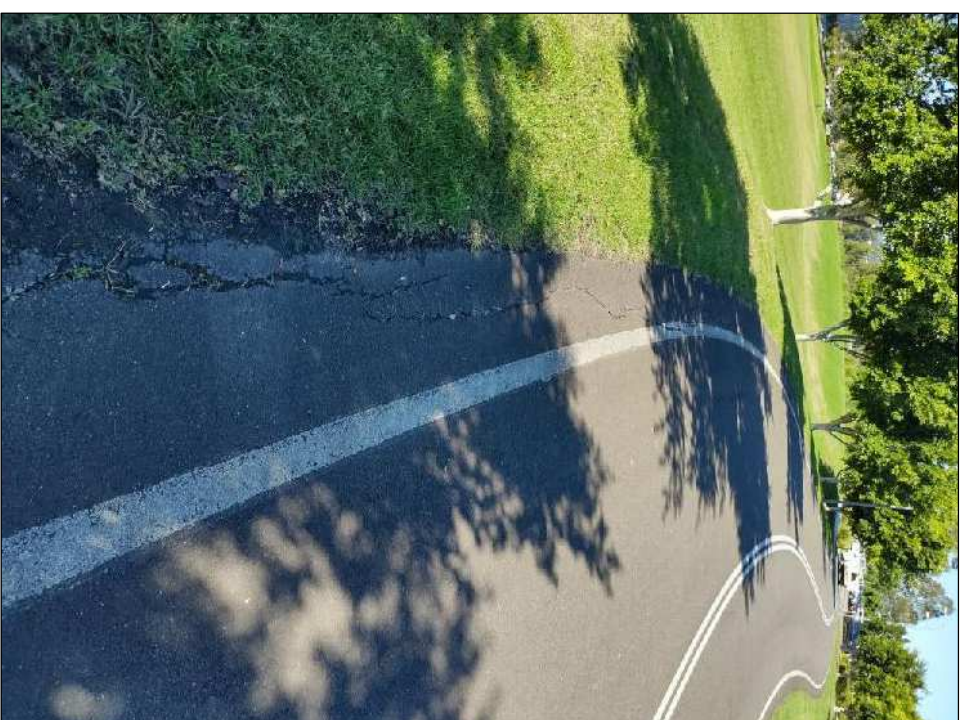



Photo 46: Edge break and longitudinal cracking mainly within the shoulder

		Photos 45 & 46		Project: 203407.00
Client: Cadence Pty Ltd		First Ave (Photo 45) and Unnamed Road (Photo 46)		Plate No: 23
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

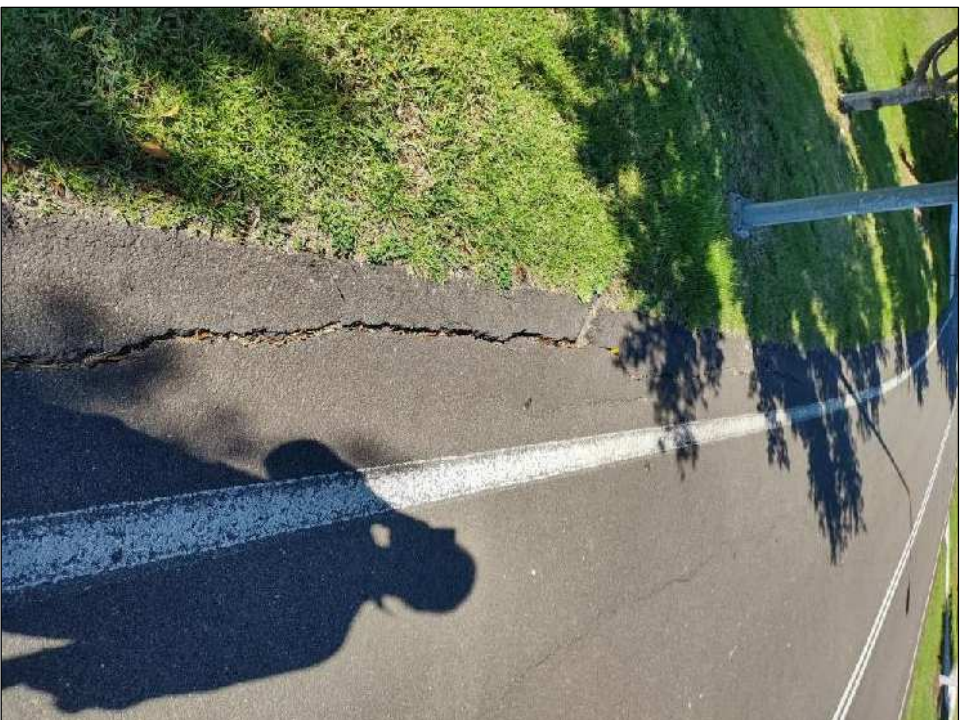



Photo 47: Edge breaks and longitudinal cracking in the road alignment



Photo 48: Longitudinal cracking

		Client: Cadence Pty Ltd		Photos 47 & 48		Project: 203407.00	
Office: Sydney		Unnamed Road – east bound		WSU Campus, Werrington		Plate No: 24	
Date: 10 May 2021						Revision: 0	

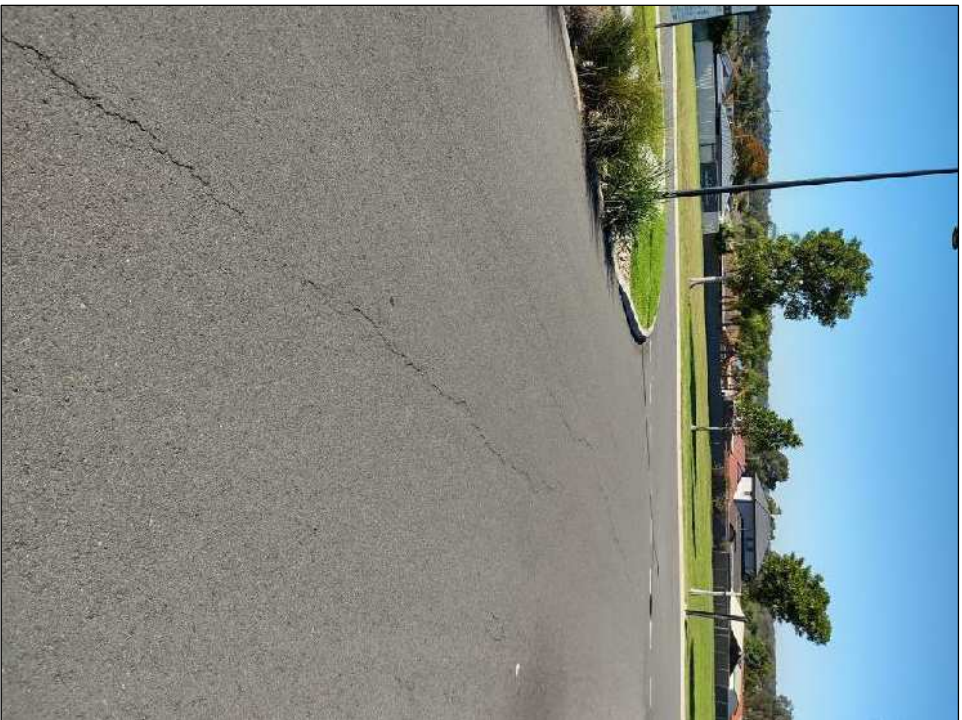


Photo 49: Longitudinal cracking



Photo 50: Longitudinal and horizontal crack



		Client: Cadence Pty Ltd		Photos 49 & 50		Project: 203407.00	
Office: Sydney		Unnamed Road (Photo 49) and First Ave (Photo 50)		Plate No: 25		Revision: 0	
Date: 10 May 2021		WSU Campus, Werrington					



Photo 51: Deformation in the form of crocodile cracking

		Photo 51		Project: 203407.00
Client: Cadence Pty Ltd		First Ave, South Campus – Northbound		Plate No: 26
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

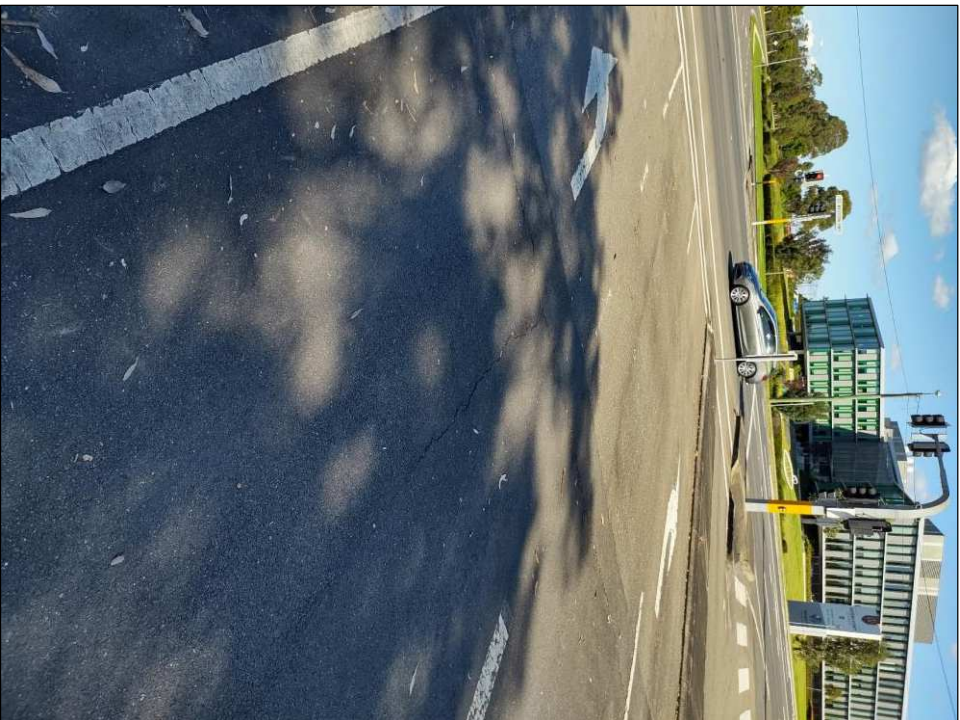


Photo 52: Longitudinal crack and horizontal cracks

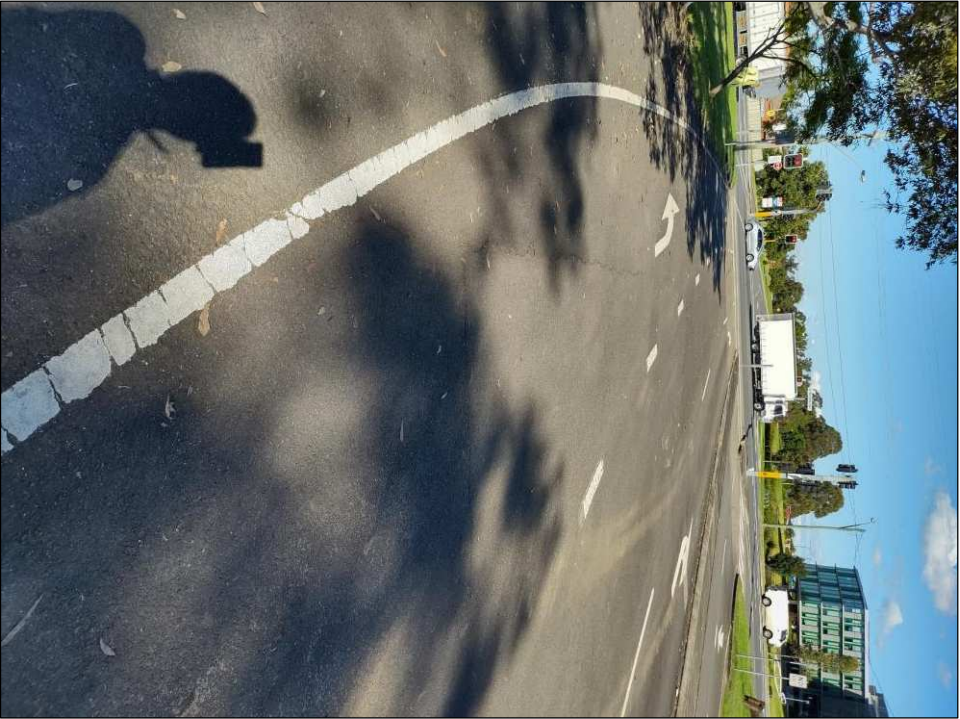



Photo 53: Horizontal and longitudinal cracks

 Douglas Partners <small>Geotechnics Environment Groundwater</small>	Client: Cadence Pty Ltd	Photos 52 & 53		Project: 203407.00
	Office: Sydney	First Avenue, Southbound		Plate No: 27
	Date: 10 May 2021	WSU Campus, Werrington		Revision: 0

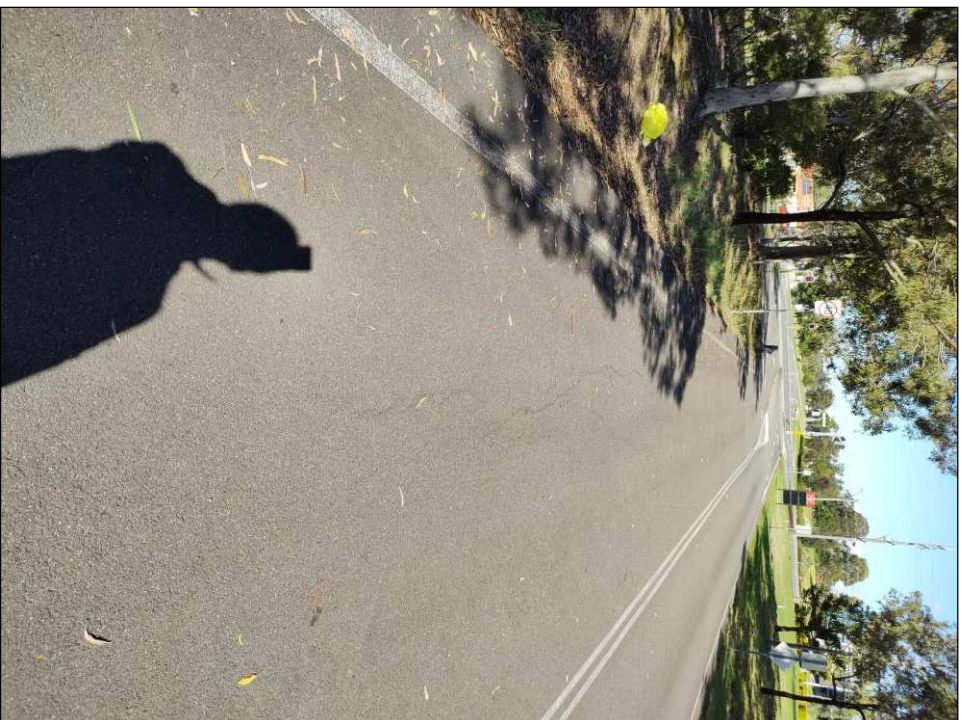


Photo 54: Longitudinal cracks

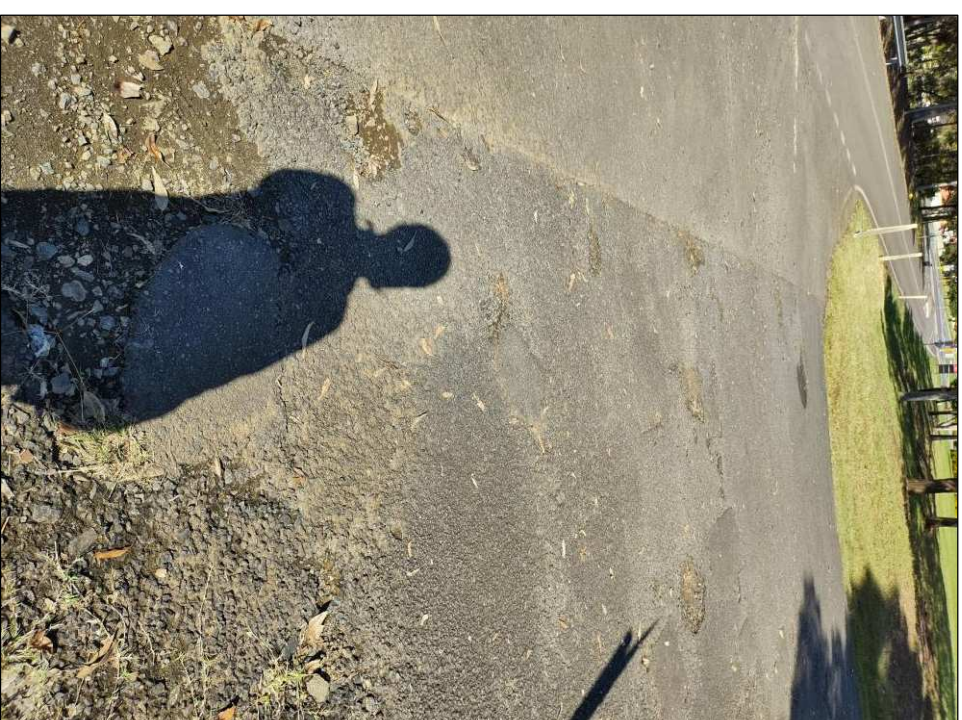


Photo 55: Inspection of first and ninth. Edge breaks, pot holes, patching and delamination


 Douglas Partners Geotechnics Environment Groundwater		
Client: Cadence Pty Ltd	Photos 54 & 55	Project: 203407.00
Office: Sydney	First Ave (Photo 54) and Ninth Ave (Photo 55)	Plate No: 28
Date: 10 May 2021	WSU Campus, Werrington	Revision: 0



Photo 56: Crocodile cracking, pots holes

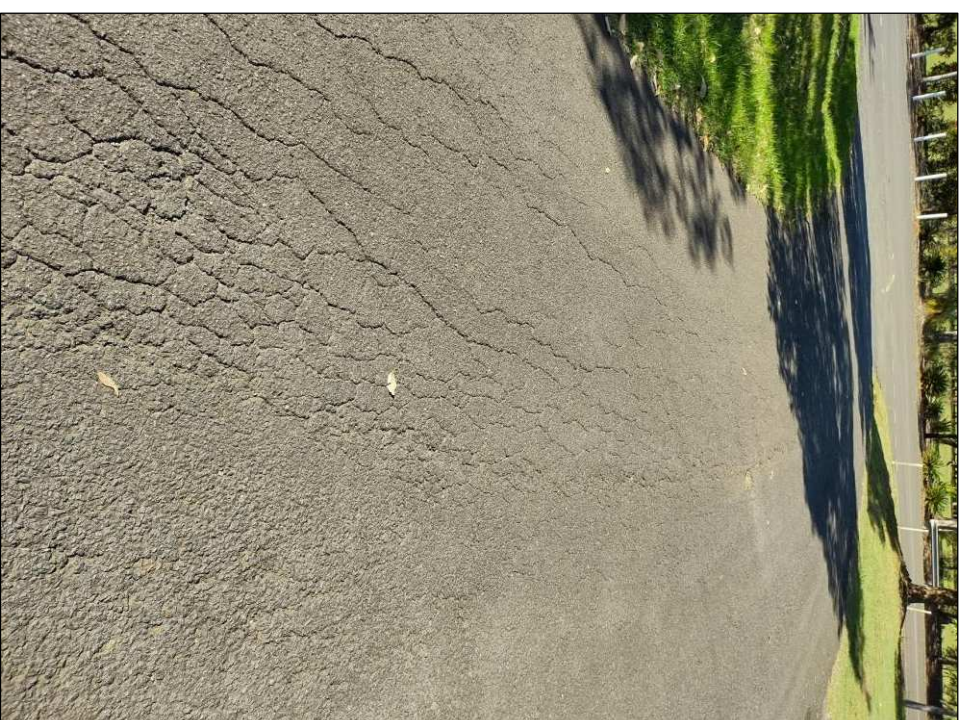



Photo 57: Delamination

 Douglas Partners <small>Geotechnics Environment Groundwater</small>		Photos 56 & 57		Project: 203407.00
Client: Cadence Pty Ltd		Ninth Avenue		Plate No: 29
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

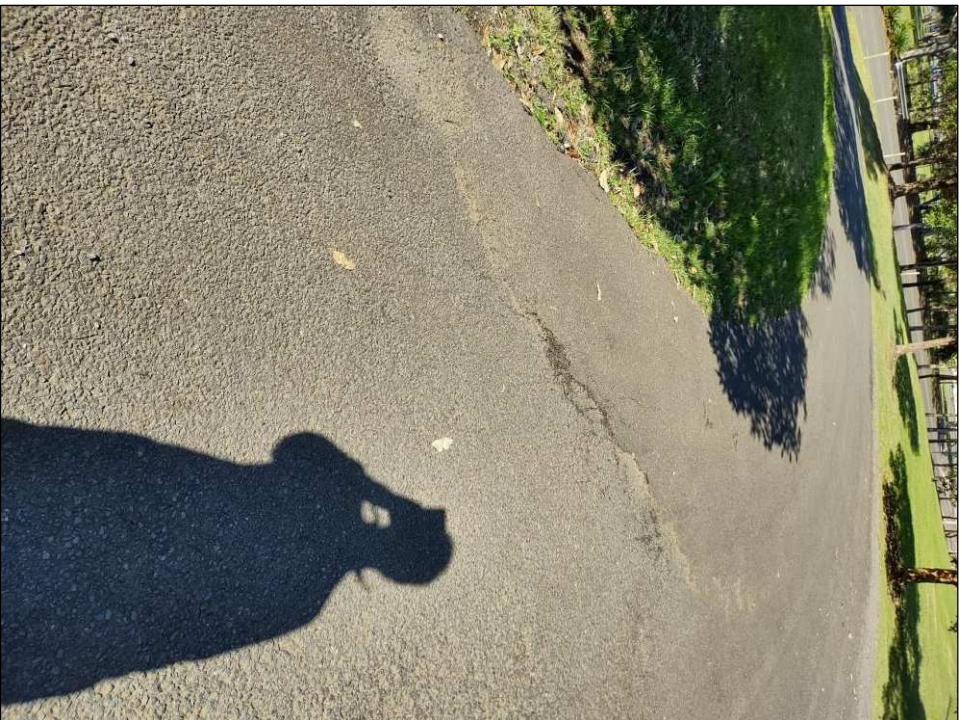


Photo 58: Pothole

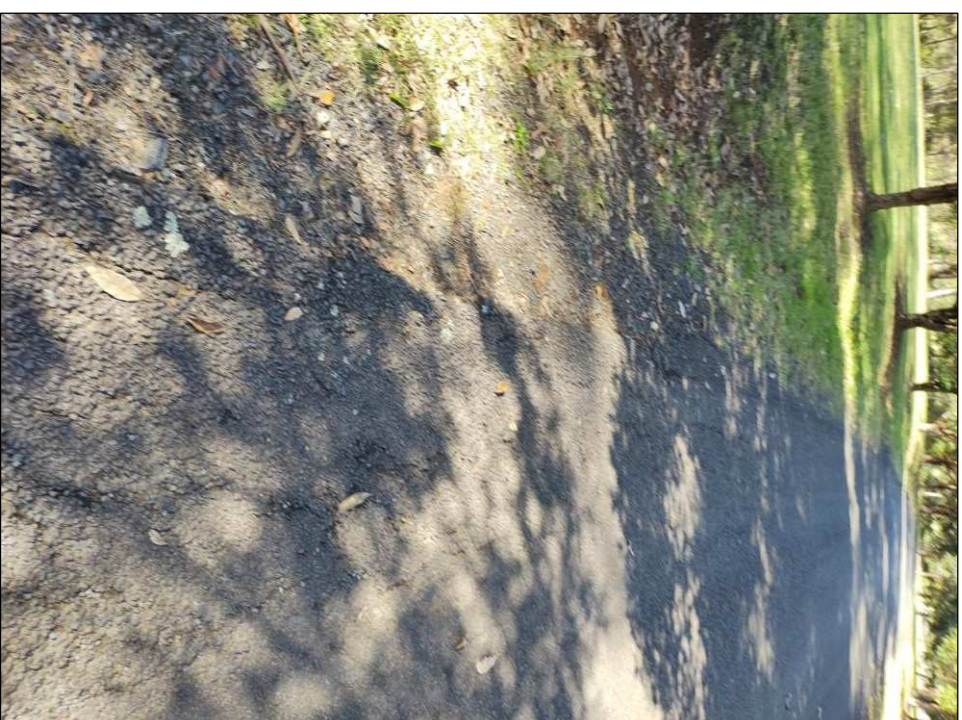



Photo 59: Longitudinal cracks and delamination mainly on the outer wheel path

 Douglas Partners <small>Geotechnics Environment Groundwater</small>		Photos 58 & 59		Project: 203407.00
Client: Cadence Pty Ltd		Ninth Avenue		Plate No: 30
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

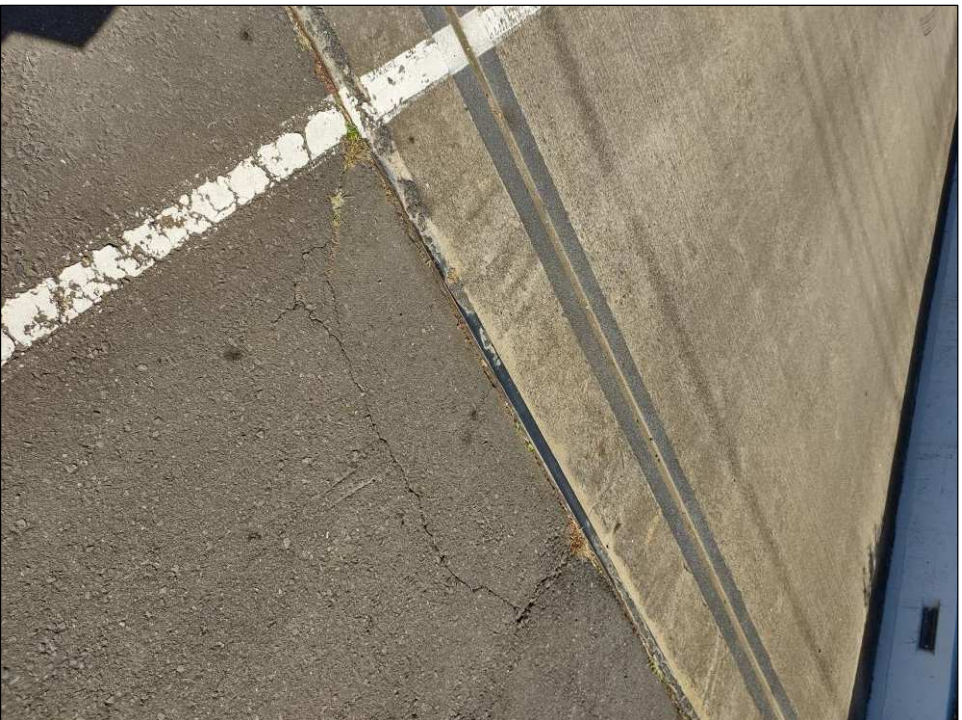



Photo 60: Break at edge



Photo 61: Longitudinal at crossing

 Douglas Partners <small>Geotechnics Environment Groundwater</small>		Client: Cadence Pty Ltd	Photos 60 & 61	Project: 203407.00
Office: Sydney		Second Avenue		Plate No: 31
Date: 10 May 2021		WSU Campus, Werrington		Revision: 0

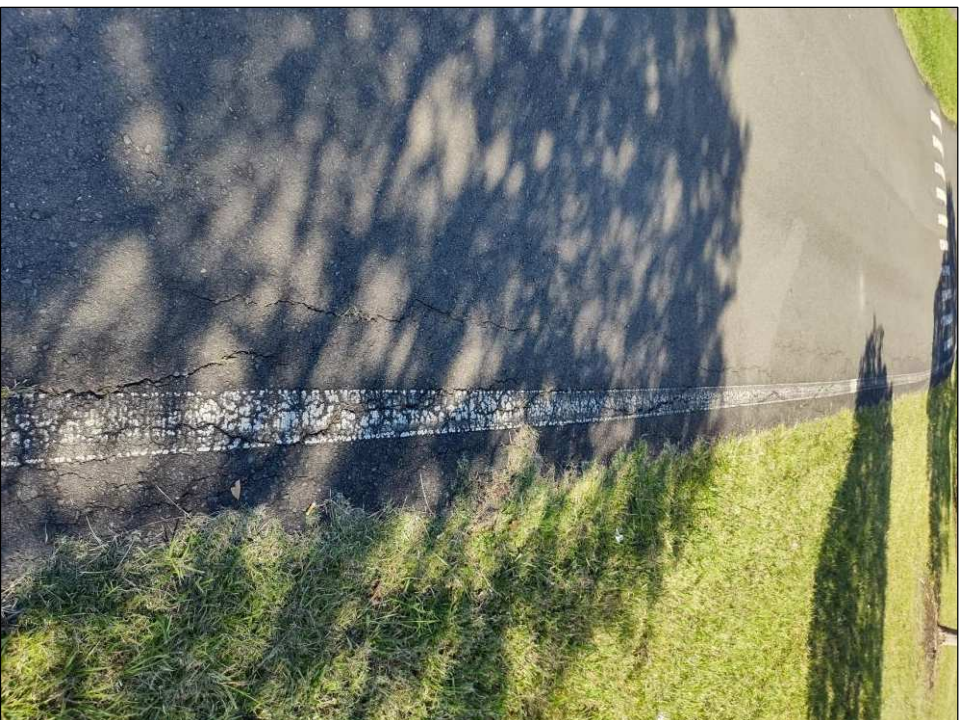


Photo 62: Longitudinal cracking and edge breaks on out wheel path

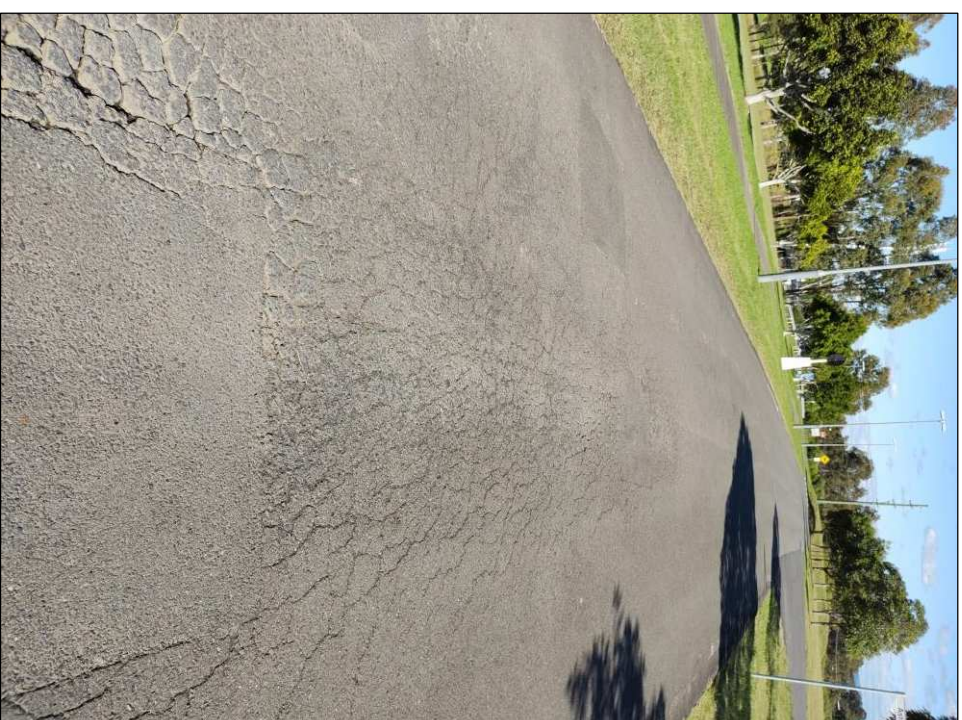


Photo 63: Crocodile cracking and patching


 Douglas Partners <small>Geotechnics Environment Groundwater</small>		Client: Cadence Pty Ltd	Photos 62 & 63	Project: 203407.00
Office: Sydney			Second Avenue	Plate No: 32
Date: 10 May 2021			WSU Campus, Werrington	Revision: 0



Photo 64: Crocodile cracking and patching



Photo 65: Longitudinal cracking along outer wheel path



		Client: Cadence Pty Ltd	Photos 64 & 65	Project: 203407.00
Office: Sydney		Second Avenue		Plate No: 33
Date: 10 May 2021		WSU Campus, Werrington		Revision: 0

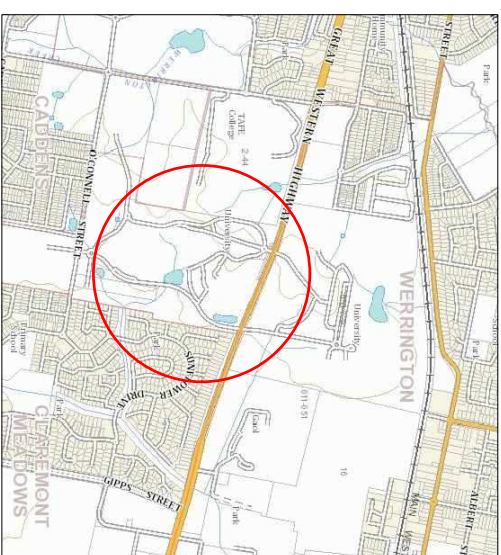


Photo 66: Edge break

 Douglas Partners <small>Geotechnics Environment Groundwater</small>		Photo 66		Project: 203407.00
Client: Cadence Pty Ltd		Second Avenue		Plate No: 34
Office: Sydney		WSU Campus, Werrington		Revision: 0
Date: 10 May 2021				

Appendix C


Drawings



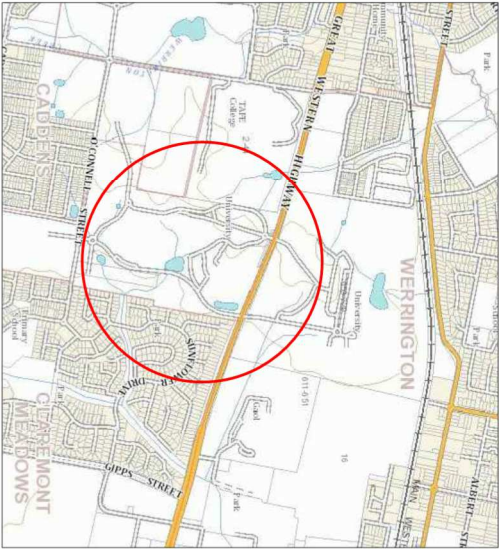
NOTE:
1: Base image from Metromap.com.au (dated 13.06.2021)



LEGEND

 BH Test Bore Location and Number





NOTE:
1: Base image from Metromap.com.au (dated 13.06.2021)



LEGEND

- Beam Test Location and Number
- "Poor" Road Condition
- "Fair" Road Condition
- "Good" Road Condition

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: **University of Western Sydney, Werrington**

OFFICE: Sydney

SCALE: 1:5000 @ A3

TITLE: **Beam Test Location Plan**
Proposed Haul Road

PROJECT No: 203407.00

DRAWING No: 2

DATE: 05/07/2021

REVISION: 0

Appendix D

Results of the Investigation



Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 - 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 - 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)

- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)

- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;

- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
Soil tends to stick together.
Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w < PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL' (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w > PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈ LL' (i.e. near the liquid limit).
- 'Wet' or 'w > LL' (i.e. wet of the liquid limit).

Symbols & Abbreviations

Douglas Partners



Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U ₅₀	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

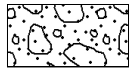
Symbols & Abbreviations

Graphic Symbols for Soil and Rock

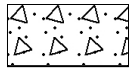
General



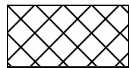
Asphalt



Road base



Concrete

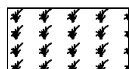


Filling

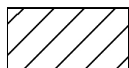
Soils



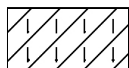
Topsoil



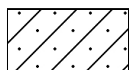
Peat



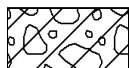
Clay



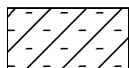
Silty clay



Sandy clay



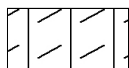
Gravelly clay



Shaly clay



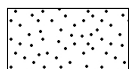
Silt



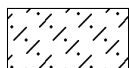
Clayey silt



Sandy silt



Sand



Clayey sand



Silty sand



Gravel



Sandy gravel



Cobbles, boulders



Talus

Sedimentary Rocks



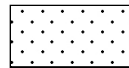
Boulder conglomerate



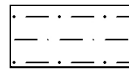
Conglomerate



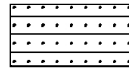
Conglomeratic sandstone



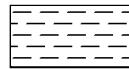
Sandstone



Siltstone



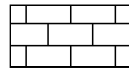
Laminite



Mudstone, claystone, shale

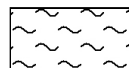


Coal

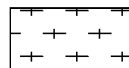


Limestone

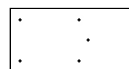
Metamorphic Rocks



Slate, phyllite, schist

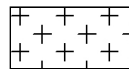


Gneiss

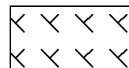


Quartzite

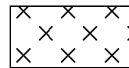
Igneous Rocks



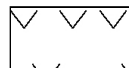
Granite



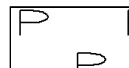
Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry



Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low

reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:
4,6,7
N=13
- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:
15, 30/40 mm

Sampling Methods

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.





- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 39.8 AHD
EASTING: 291221
NORTHING: 6261529.7
DIP/AZIMUTH: 90°/--

BORE No: BH1
PROJECT No: 203407.00
DATE: 2/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 50mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.03	ASPHALTIC CONCRETE: igneous gravel of 14mm nominal diameter (wearing course) PAVEMENT/Sandy GRAVEL: fine to medium igneous gravel of 20mm nominal diameter, dark grey, fine to coarse sand, with silt, moist, appears moderately compacted (road base, possible DGB20)										
	0.4	FILL/Sandy CLAY: low plasticity, orange-brown, fine, trace fine to medium sandstone and ironstone gravel, w>PL, in a stiff condition (subgrade)		B	0.4							
	0.6	FILL/Silty CLAY: low to medium plasticity, grey-brown, trace sand, trace fine igneous and ironstone gravel, w>PL, in a stiff condition			0.6							
	0.8	FILL/Silty CLAY: low to medium plasticity, brown mottled orange and red, trace fine sand, trace fine to medium sandstone gravel, w<PL, in a stiff condition (possible reworked natural)		B	0.8							
	1.1	Bore discontinued at 1.1m			1.1							

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 1.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Crocodile cracking and shoving observed on the road surface near the borehole location

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 41.2 AHD
EASTING: 291041.7
NORTHING: 6261266.4
DIP/AZIMUTH: 90°/--

BORE No: BH2
PROJECT No: 203407.00
DATE: 2/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.06	ASPHALTIC CONCRETE: igneous gravel of 14mm nominal diameter (wearing course)										
		PAVEMENT/Sandy GRAVEL: fine to medium igneous gravel of 20mm nominal diameter, grey-brown, fine to coarse sand, trace silt, dry, appears moderately compacted (road base, possible DGB20)										
	0.65	Below 0.6m: with coarse igneous gravel and cobbles										
		Bore discontinued at 0.65m Auger refusal on igneous cobbles										
	1											
	40											

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 0.65m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Longitudinal cracking observed on the road surface near the borehole location

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 41.8 AHD
EASTING: 290892.6
NORTHING: 6260939.1
DIP/AZIMUTH: 90°/--

BORE No: BH3
PROJECT No: 203407.00
DATE: 2/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.03	ASPHALTIC CONCRETE: igneous gravel of 10mm nominal diameter (wearing course)										
		PAVEMENT/Sandy GRAVEL: fine to coarse igneous gravel of 20mm nominal diameter, dark grey, fine to coarse sand, with silt, moist, appears moderately compacted (road base, possible DGB20)										
	0.4	CLAY CI-CH: medium to high plasticity, pale grey, w<PL, stiff, residual (subgrade)			0.4							
		Below 0.6m: grading to pale grey mottled orange-brown, trace fine ironstone gravel		B								
	1	Below 1.0m: grading to pale grey mottled yellow brown, w>PL			1.0							
	1.1	Bore discontinued at 1.1m										

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 1.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Crocodile cracking observed on the road surface near the borehole location

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 52.3 AHD
EASTING: 290753.8
NORTHING: 6261112.5
DIP/AZIMUTH: 90°/-

BORE No: BH4
PROJECT No: 203407.00
DATE: 2/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.04	ASPHALTIC CONCRETE: igneous gravel of 10mm nominal diameter (wearing course)										
		PAVEMENT/Sandy GRAVEL: fine to medium igneous gravel of 20mm nominal diameter, dark grey, fine to coarse sand, with silt, moist, appears moderately compacted (road base, possible DGB20)										
	0.4	Silty CLAY CL: low plasticity, orange-brown, with fine sand, w~PL, stiff to very stiff, residual (subgrade)										
		Below 0.5m: orange-brown mottled grey, trace fine to medium ironstone and sandstone gravel, w<PL										
		Below 0.9m: hard										
	1.1	Bore discontinued at 1.1m										

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 1.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Crocodile cracking and delamination observed on the road surface near the borehole location

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 57.1 AHD
EASTING: 290749.2
NORTHING: 6261597.3
DIP/AZIMUTH: 90°/--

BORE No: BH5
PROJECT No: 203407.00
DATE: 4/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
57	0.03	ASPHALTIC CONCRETE: igneous gravel of 10mm nominal diameter (wearing course)										
	0.15	PAVEMENT/Sandy GRAVEL: fine to medium igneous gravel of 20mm nominal diameter, dark grey, fine to coarse sand, trace silt, moist, appears moderately compacted (road base, possible DGB20)										
	0.35	PAVEMENT/Sandy GRAVEL: fine to coarse sandstone gravel, brown, fine to coarse sand, trace silt, moist, appears moderately compacted (sub-base layer, possible DGS)										
	0.8	Silty CLAY CL: low plasticity, red-brown, with fine sand, w<PL, stiff to very stiff to hard, residual (subgrade)										
	0.8	SANDSTONE: fine grained, brown, inferred very low strength, Bringelly Shale										
56	1.1	Bore discontinued at 1.1m										

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 1.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Longitudinal cracking observed on the road surface near the borehole location

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 53.6 AHD
EASTING: 291010.7
NORTHING: 6261542
DIP/AZIMUTH: 90°/--

BORE No: BH6
PROJECT No: 203407.00
DATE: 2/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.05	ASPHALTIC CONCRETE: igneous gravel of 14mm nominal diameter (wearing course)										
		PAVEMENT/Sandy GRAVEL: fine to medium igneous gravel of 20mm nominal diameter, grey-brown, fine to coarse sand, trace silt, trace fine sandstone gravel, moist, appears moderately compacted (road base, possible DGB20)										
		Below 0.4m: grading to with fine to coarse sandstone gravel										
	0.5	Silty CLAY CL: low plasticity, red-brown, with fine sand, trace fine ironstone gravel, w<PL, stiff, residual (subgrade)			0.5							
			B									
	1				1.0							
	1.1	Bore discontinued at 1.1m										

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 1.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Longitudinal cracking observed on the road surface near the borehole location

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 65.6 AHD
EASTING: 291005.6
NORTHING: 6261875
DIP/AZIMUTH: 90°/--

BORE No: BH7
PROJECT No: 203407.00
DATE: 4/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.04	ASPHALTIC CONCRETE: igneous gravel of 14mm nominal diameter (wearing course)										
		PAVEMENT/Sandy GRAVEL: fine to medium igneous gravel of 20mm nominal diameter, dark grey, fine to coarse sand, with silt, moist, appears moderately compacted (road base, possible DGB20)										
	0.35	CLAY CI-CH: medium to high plasticity, pale grey mottled pale brown, trace carbonaceous inclusions, w>PL, stiff, residual (subgrade)			0.4							
				B								
		Below 0.7m: grading to pale grey mottled red-brown, trace fine ironstone gravel			0.8							
	1											
	1.1	Bore discontinued at 1.1m										

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 1.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Crocodile cracking and previous patching near the borehole location

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 48.3 AHD
EASTING: 291214.5
NORTHING: 6261808.7
DIP/AZIMUTH: 90°/--

BORE No: BH8
PROJECT No: 203407.00
DATE: 4/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.02	ASPHALTIC CONCRETE: igneous gravel of 14mm nominal diameter (wearing course)										
		PAVEMENT/Sandy GRAVEL: fine to coarse igneous gravel, grey-brown, trace silt, moist, appears moderately compacted (road base, possible DGB20)										
	0.25	FILL/Sandy CLAY: low plasticity, dark brown, fine to medium, w<PL, appears moderately compacted (possible re-worked natural, subgrade)										
	0.5	Sandy CLAY CL: low plasticity, brown mottled red-brown, fine, very stiff, residual			0.5							
	1.0				1.0							
	1.1	Bore discontinued at 1.1m										

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 1.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Delamination and previous patching near the borehole location

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Cadence Pty Ltd
PROJECT: Proposed Haul Road
LOCATION: Western Sydney University, South Werrington Campus

SURFACE LEVEL: 42.9 AHD
EASTING: 291240.2
NORTHING: 6261659.2
DIP/AZIMUTH: 90°/--

BORE No: BH9
PROJECT No: 203407.00
DATE: 4/6/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
	0.1	ASPHALTIC CONCRETE: igneous gravel of 14mm nominal diameter (wearing course)								
		Bore discontinued at 0.1m Auger refusal on concrete								

RIG: 5 tonne excavator

DRILLER: A&A

LOGGED: LHS

CASING: Uncased

TYPE OF BORING: Solid flight auger (300mm dia.) to 0.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Pavement surface appeared to be in relatively good condition near the borehole location

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)



Douglas Partners
 Geotechnics | Environment | Groundwater

Benkleman Beam Results

Client	Cadence Pty Ltd	Date	1-Jun-21
Project	Pavement Condition Assessment	Project No.	203407.00
Location	Western Sydney University South Campus, First Avenue, Werrington	Operator	M Gref

VALUE OF f' FROM AUSTRROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS					DEFLECTIONS (mm)				CURVATURE FUNCTION (mm)		
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m		2.7m	Max Defln
1	NB	L	0	15				35	0.40	0.70	0.70	0.70	0.70	0.30
2	NB	R	0	9				16	0.14	0.32	0.32	0.32	0.32	0.18
3	NB	L	0	8				8	0.00	0.16	0.16	0.16	0.16	0.16
110	NB	L	0	0				8	0.16	0.16	0.16	0.16	0.16	0.00
111	NB	R	0	0				2	0.04	0.04	0.04	0.04	0.04	0.00
112	NB	L	0	2				20	0.36	0.40	0.40	0.40	0.40	0.04
113	NB	R	0	3				24	0.42	0.48	0.48	0.48	0.48	0.06
114	NB	L	0	6				28	0.44	0.56	0.56	0.56	0.56	0.12

AVERAGE DEFLECTION (mm) = 0.35
STANDARD DEVIATION = 0.23
CHARACTERISTIC DEFLECTION (mm) = 0.72
CHARACTERISTIC CURVATURE (mm) = 0.11

Benkelman Beam Test Results

Client Cadence Pty Ltd**Date** 1-Jun-21**Project** Pavement Condition Assessment**Project No.** 203407.00**Location** Western Sydney University South Campus, First Avenue, Werrington**Operator** M GrefVALUE OF f' FROM AUSTRROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS						DEFLECTIONS (mm)						CURVATURE FUNCTION (mm)
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m	Max Defln		
4	SB	L	0	6				10	0.08	0.20	0.20	0.20	0.20		0.12
5	SB	R	0	3				8	0.10	0.16	0.16	0.16	0.16		0.06
6	SB	L	0	8				24	0.32	0.48	0.48	0.48	0.48		0.16
7	SB	R	0	4				7	0.06	0.14	0.14	0.14	0.14		0.08
8	SB	L	0	1				8	0.14	0.16	0.16	0.16	0.16		0.02
9	SB	R	0	2				19	0.34	0.38	0.38	0.38	0.38		0.04
10	SB	L	0	1				5	0.08	0.10	0.10	0.10	0.10		0.02
11	SB	R	0	2				8	0.12	0.16	0.16	0.16	0.16		0.04
12	SB	L	0	1				9	0.16	0.18	0.18	0.18	0.18		0.02
13	SB	R	0	1				3	0.04	0.06	0.06	0.06	0.06		0.02
14	SB	L	0	1				11	0.20	0.22	0.22	0.22	0.22		0.02
15	SB	R	0	3				8	0.10	0.16	0.16	0.16	0.16		0.06
16	SB	L	0	1				4	0.06	0.08	0.08	0.08	0.08		0.02
17	SB	R	0	0				0	0.00	0.00	0.00	0.00	0.00		0.00
18	SB	L	0	1				1	0.00	0.02	0.02	0.02	0.02		0.02
19	SB	R	0	1				3	0.04	0.06	0.06	0.06	0.06		0.02
20	SB	L	0	1				10	0.18	0.20	0.20	0.20	0.20		0.02
21	SB	R	0	3				12	0.18	0.24	0.24	0.24	0.24		0.06
22	SB	L	0	1				13	0.24	0.26	0.26	0.26	0.26		0.02
23	SB	R	0	1				5	0.08	0.10	0.10	0.10	0.10		0.02
24	SB	L	0	3				14	0.22	0.28	0.28	0.28	0.28		0.06
25	SB	R	0	1				4	0.06	0.08	0.08	0.08	0.08		0.02
26	SB	L	0	5				20	0.30	0.40	0.40	0.40	0.40		0.10
27	SB	R	0	9				21	0.24	0.42	0.42	0.42	0.42		0.18
28	SB	L	0	7				25	0.36	0.50	0.50	0.50	0.50		0.14
29	SB	R	0	2				14	0.24	0.28	0.28	0.28	0.28		0.04
30	SB	L	0	5				16	0.22	0.32	0.32	0.32	0.32		0.10

Benkelman Beam Test Results

Client Cadence Pty Ltd

Project Pavement Condition Assessment

Location Western Sydney University South Campus, First Avenue, Werrington

Date 1-Jun-21

Project No. 203407.00

Operator M Gref

VALUE OF f' FROM AUSTRROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS						DEFLECTIONS (mm)					CURVATURE FUNCTION (mm)
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m	Max Defln	
31	SB	R	0	0				9	0.18	0.18	0.18	0.18	0.18	0.00
32	SB	L	0	2				7	0.10	0.14	0.14	0.14	0.14	0.04
33	SB	R	0	1				10	0.18	0.20	0.20	0.20	0.20	0.02
34	SB	L	0	2				12	0.20	0.24	0.24	0.24	0.24	0.04
35	SB	R	0	0				1	0.02	0.02	0.02	0.02	0.02	0.00
36	SB	L	0	1				4	0.06	0.08	0.08	0.08	0.08	0.02
37	SB	R	0	0				0	0.00	0.00	0.00	0.00	0.00	0.00
38	SB	L	0	1				2	0.02	0.04	0.04	0.04	0.04	0.02
39	SB	R	0	0				5	0.10	0.10	0.10	0.10	0.10	0.00
40	SB	L	0	2				16	0.28	0.32	0.32	0.32	0.32	0.04
41	SB	R	0	21				45	0.48	0.90	0.90	0.90	0.90	0.42
42	SB	L	0	11				29	0.36	0.58	0.58	0.58	0.58	0.22
43	SB	R	0	59				119	1.20	2.38	2.38	2.38	2.38	1.18

AVERAGE DEFLECTION (mm) = 0.27

STANDARD DEVIATION = 0.39

CHARACTERISTIC DEFLECTION (mm) = 0.91

CHARACTERISTIC CURVATURE (mm) = 0.09

Benkelman Beam Test Results

Client Cadence Pty Ltd
Project Pavement Condition Assessment
Location Western Sydney University South Campus, Third Avenue, Werrington

Date 1-Jun-21
Project No. 203407.00
Operator M Gref

VALUE OF f' FROM AUSTRROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS					DEFLECTIONS (mm)					CURVATURE FUNCTION (mm)	
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m		Max Defln
44	WB	L	0	4				22	0.36	0.44	0.44	0.44	0.44	0.08
45	WB	R	0	5				27	0.44	0.54	0.54	0.54	0.54	0.10
46	WB	L	0	3				10	0.14	0.20	0.20	0.20	0.20	0.06
47	WB	R	0	9				32	0.46	0.64	0.64	0.64	0.64	0.18
48	WB	L	0	0				2	0.04	0.04	0.04	0.04	0.04	0.00
49	WB	R	0	5				28	0.46	0.56	0.56	0.56	0.56	0.10
50	WB	L	0	10				32	0.44	0.64	0.64	0.64	0.64	0.20
51	WB	R	0	1				13	0.24	0.26	0.26	0.26	0.26	0.02
52	WB	L	0	5				42	0.74	0.84	0.84	0.84	0.84	0.10
53	WB	R	0	8				36	0.56	0.72	0.72	0.72	0.72	0.16
54	WB	L	0	0				6	0.12	0.12	0.12	0.12	0.12	0.00

AVERAGE DEFLECTION (mm) = 0.45
STANDARD DEVIATION = 0.26
CHARACTERISTIC DEFLECTION (mm) = **0.89**
CHARACTERISTIC CURVATURE (mm) = **0.09**

Benkelman Beam Test Results

Client Cadence Pty Ltd**Date** 1-Jun-21**Project** Pavement Condition Assessment**Project No.** 203407.00**Location** Western Sydney University South Campus, King Street, Werrington**Operator** M GrefVALUE OF f' FROM AUSTROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS						DEFLECTIONS (mm)						CURVATURE FUNCTION (mm)
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m	Max Defln		
55	NB	R	0	8				25	0.34	0.50	0.50	0.50	0.50		0.16
56	NB	L	0	7				49	0.84	0.98	0.98	0.98	0.98		0.14
57	NB	R	0	10				16	0.12	0.32	0.32	0.32	0.32		0.20
58	NB	L	0	4				19	0.30	0.38	0.38	0.38	0.38		0.08
59	NB	R	0	3				17	0.28	0.34	0.34	0.34	0.34		0.06
60	NB	L	0	11				30	0.38	0.60	0.60	0.60	0.60		0.22
61	NB	R	0	6				16	0.20	0.32	0.32	0.32	0.32		0.12
62	NB	L	0	13				50	0.74	1.00	1.00	1.00	1.00		0.26
63	NB	R	0	10				32	0.44	0.64	0.64	0.64	0.64		0.20
64	NB	L	0	19				38	0.38	0.76	0.76	0.76	0.76		0.38
65	NB	R	0	7				25	0.36	0.50	0.50	0.50	0.50		0.14
66	NB	L	0	4				21	0.34	0.42	0.42	0.42	0.42		0.08
67	NB	R	0	5				13	0.16	0.26	0.26	0.26	0.26		0.10
68	NB	L	0	2				14	0.24	0.28	0.28	0.28	0.28		0.04
69	NB	R	0	4				15	0.22	0.30	0.30	0.30	0.30		0.08
70	NB	L	0	1				15	0.28	0.30	0.30	0.30	0.30		0.02
71	NB	R	0	6				19	0.26	0.38	0.38	0.38	0.38		0.12
72	NB	L	0	8				28	0.40	0.56	0.56	0.56	0.56		0.16
73	NB	R	0	0				5	0.10	0.10	0.10	0.10	0.10		0.00
74	NB	L	0	5				11	0.12	0.22	0.22	0.22	0.22		0.10
75	NB	R	0	1				13	0.24	0.26	0.26	0.26	0.26		0.02
76	NB	L	0	2				27	0.50	0.54	0.54	0.54	0.54		0.04
77	NB	R	0	0				12	0.24	0.24	0.24	0.24	0.24		0.00
78	NB	L	0	11				26	0.30	0.52	0.52	0.52	0.52		0.22
79	NB	R	0	1				9	0.16	0.18	0.18	0.18	0.18		0.02
80	NB	L	0	2				20	0.36	0.40	0.40	0.40	0.40		0.04
81	NB	R	0	0				6	0.12	0.12	0.12	0.12	0.12		0.00

Benkelman Beam Test Results

Client Cadence Pty Ltd

Date 1-Jun-21

Project Pavement Condition Assessment

Project No. 203407.00

Location Western Sydney University South Campus, King Street, Werrington

Operator M Gref

VALUE OF f_r FROM AUSTRROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS						DEFLECTIONS (mm)					CURVATURE FUNCTION (mm)
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m	Max Defln	
82	NB	L	0	9				20	0.22	0.40	0.40	0.40	0.40	0.18
83	NB	R	0	7				43	0.72	0.86	0.86	0.86	0.86	0.14
84	NB	L	0	5				32	0.54	0.64	0.64	0.64	0.64	0.10
85	NB	R	0	2				25	0.46	0.50	0.50	0.50	0.50	0.04
86	NB	L	0	11				44	0.66	0.88	0.88	0.88	0.88	0.22
87	NB	R	0	0				13	0.26	0.26	0.26	0.26	0.26	0.00
88	NB	L	0	1				17	0.32	0.34	0.34	0.34	0.34	0.02
89	NB	R	0	2				11	0.18	0.22	0.22	0.22	0.22	0.04
90	NB	L	0	0				6	0.12	0.12	0.12	0.12	0.12	0.00

AVERAGE DEFLECTION (mm) = 0.43
STANDARD DEVIATION = 0.24
CHARACTERISTIC DEFLECTION (mm) = **0.83**
CHARACTERISTIC CURVATURE (mm) = **0.10**

Benkelman Beam Test Results

Client Cadence Pty Ltd

Project Pavement Condition Assessment

Location Western Sydney University South Campus, Unnamed Road, Werrington

Date 1-Jun-21

Project No. 203407.00

Operator M Gref

VALUE OF f_r FROM AUSTRROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS					DEFLECTIONS (mm)					CURVATURE FUNCTION (mm)	
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m		Max Defln
91	EB	R	0	7				31	0.48	0.62	0.62	0.62	0.62	0.14
92	EB	L	0	8				33	0.50	0.66	0.66	0.66	0.66	0.16
93	EB	R	0	4				22	0.36	0.44	0.44	0.44	0.44	0.08
94	EB	L	0	5				27	0.44	0.54	0.54	0.54	0.54	0.10
95	EB	R	0	0				5	0.10	0.10	0.10	0.10	0.10	0.00
96	EB	L	0	0				2	0.04	0.04	0.04	0.04	0.04	0.00
97	EB	R	0	0				4	0.08	0.08	0.08	0.08	0.08	0.00
98	EB	L	0	1				1	0.00	0.02	0.02	0.02	0.02	0.02
99	EB	R	0	0				0	0.00	0.00	0.00	0.00	0.00	0.00
100	EB	L	0	1				2	0.02	0.04	0.04	0.04	0.04	0.02
101	EB	R	0	7				20	0.26	0.40	0.40	0.40	0.40	0.14
102	EB	L	0	0				10	0.20	0.20	0.20	0.20	0.20	0.00
103	EB	R	0	1				7	0.12	0.14	0.14	0.14	0.14	0.02
104	EB	L	0	1				5	0.08	0.10	0.10	0.10	0.10	0.02
105	EB	R	0	1				9	0.16	0.18	0.18	0.18	0.18	0.02
106	EB	L	0	2				4	0.04	0.08	0.08	0.08	0.08	0.04
107	EB	R	0	3				16	0.26	0.32	0.32	0.32	0.32	0.06
108	EB	L	0	1				5	0.08	0.10	0.10	0.10	0.10	0.02
109	EB	R	0	1				5	0.08	0.10	0.10	0.10	0.10	0.02

AVERAGE DEFLECTION (mm) = 0.22
STANDARD DEVIATION = 0.21
CHARACTERISTIC DEFLECTION (mm) = 0.57
CHARACTERISTIC CURVATURE (mm) = 0.05

Benkelman Beam Test Results

Client	Cadence Pty Ltd	Date	1-Jun-21
Project	Pavement Condition Assessment	Project No.	203407.00
Location	Western Sydney University North Campus, First Avenue, Werrington	Operator	M Gref

VALUE OF f' FROM AUSTRROADS TABLE 6.3

1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS					DEFLECTIONS (mm)					CURVATURE FUNCTION (mm)	
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m		Max Defln
142	SB	R	0	0				10	0.20	0.20	0.20	0.20	0.20	0.00
143	SB	L	0	5				21	0.32	0.42	0.42	0.42	0.42	0.10
144	SB	R	0	3				20	0.34	0.40	0.40	0.40	0.40	0.06
145	SB	L	0	9				23	0.28	0.46	0.46	0.46	0.46	0.18
146	SB	R	0	1				21	0.40	0.42	0.42	0.42	0.42	0.02
147	SB	L	0	0				5	0.10	0.10	0.10	0.10	0.10	0.00
148	SB	R	0	0				1	0.02	0.02	0.02	0.02	0.02	0.00

AVERAGE DEFLECTION (mm) = 0.29
STANDARD DEVIATION = 0.18
CHARACTERISTIC DEFLECTION (mm) = 0.58
CHARACTERISTIC CURVATURE (mm) = 0.05

Benkelman Beam Test Results

Client	Cadence Pty Ltd	Date	1-Jun-21
Project	Pavement Condition Assessment	Project No.	203407.00
Location	Western Sydney University North Campus, Second Avenue, Werrington	Operator	M Gref

VALUE OF 'f' FROM AUSTRROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS					DEFLECTIONS (mm)					CURVATURE FUNCTION (mm)	
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m		Max Defln
115	NB	L	0	5				37	0.64	0.74	0.74	0.74		0.10
116	NB	R	0	7				29	0.44	0.58	0.58	0.58		0.14
117	NB	L	0	4				30	0.52	0.60	0.60	0.60		0.08
118	NB	R	0	5				44	0.78	0.88	0.88	0.88		0.10
119	NB	L	0	15				49	0.68	0.98	0.98	0.98		0.30
120	NB	R	0	8				35	0.54	0.70	0.70	0.70		0.16
121	NB	L	0	3				43	0.80	0.86	0.86	0.86		0.06
122	NB	R	0	6				30	0.48	0.60	0.60	0.60		0.12
123	NB	L	0	9				47	0.76	0.94	0.94	0.94		0.18
124	NB	R	0	15				48	0.66	0.96	0.96	0.96		0.30
125	NB	L	0	18				41	0.46	0.82	0.82	0.82		0.36
126	NB	R	0	7				39	0.64	0.78	0.78	0.78		0.14
127	NB	L	0	5				22	0.34	0.44	0.44	0.44		0.10

AVERAGE DEFLECTION (mm) = 0.76
STANDARD DEVIATION = 0.17
CHARACTERISTIC DEFLECTION (mm) = 1.04
CHARACTERISTIC CURVATURE (mm) = 0.16

Benkelman Beam Test Results

Client Cadence Pty Ltd

Date 1-Jun-21

Project Pavement Condition Assessment

Project No. 203407.00

Location Western Sydney University North Campus, Ninth Avenue, Werrington

Operator M Gref

VALUE OF f_r FROM AUSTRROADS TABLE 6.3 1.65

Test Location	LANE	WHEEL TRACK	BEAM READINGS					DEFLECTIONS (mm)					CURVATURE FUNCTION (mm)		
			0.0m	0.2m	0.6m	0.9m	2.7m	9.0m	0.2m	0.6m	0.9m	2.7m		Max Defln	
128	EB	R	0	3				24	0.42	0.48	0.48	0.48	0.48		0.06
129	EB	L	0	18				34	0.32	0.68	0.68	0.68	0.68		0.36
130	EB	R	0	8				33	0.50	0.66	0.66	0.66	0.66		0.16
131	EB	L	0	15				36	0.42	0.72	0.72	0.72	0.72		0.30
132	EB	R	0	12				37	0.50	0.74	0.74	0.74	0.74		0.24
133	EB	L	0	10				28	0.36	0.56	0.56	0.56	0.56		0.20
134	EB	R	0	8				25	0.34	0.50	0.50	0.50	0.50		0.16
135	EB	L	0	6				30	0.48	0.60	0.60	0.60	0.60		0.12
136	EB	R	0	7				24	0.34	0.48	0.48	0.48	0.48		0.14
137	EB	L	0	12				32	0.40	0.64	0.64	0.64	0.64		0.24
138	EB	R	0	1				23	0.44	0.46	0.46	0.46	0.46		0.02
139	EB	L	0	2				7	0.10	0.14	0.14	0.14	0.14		0.04
140	EB	R	0	19				48	0.58	0.96	0.96	0.96	0.96		0.38
141	EB	L	0	12				25	0.26	0.50	0.50	0.50	0.50		0.24

AVERAGE DEFLECTION (mm) = 0.58
STANDARD DEVIATION = 0.19
CHARACTERISTIC DEFLECTION (mm) = 0.89
CHARACTERISTIC CURVATURE (mm) = 0.19

Results of the Visual Assessment

Southern Campus							
Road	Alignment	Chainage	Gradient	Pavement Seal	Defects Description	Photo's	Condition
First Avenue	South Bound	0 - 60	Generally flat / Grades to Great Western Highway	AC	Crocodile Cracking along the entry and exit lanes, longitudinal and meandering cracks (previously resealed), minor patching	1-3	Poor
First Avenue	South Bound	60-220	Grades slightly to the east. No gutter.	AC	Some intermittent longitudinal cracking, no significant defects observed	-	Good
First Avenue	South Bound	220-640	Generally flat, area appears to be built on fill	AC	Intermittent longitudinal cracking along south bound alignment / edge breaks / no kerb and gutter	4-6	Fair
First Avenue	South Bound	640-680	Generally flat	AC	Longitudinal cracking along south bound alignment, diagonal crack through interlocking pavers, edge breaks and localised potholes at pavement junction	10-12	Fair
First Avenue	South Bound	680-740	Generally flat with a gentle grade to the east	AC	Localised patch and cracking in footpath	13, 14	Fair
First and Third Ave	Roundabout	740-820	gentle grade to west	AC	Crocodile Cracking along the entry and exit lanes, longitudinal and meandering cracks (previously resealed), minor patching	15-21	Poor
Third Ave	Westbound	820-1000	grades south to south east	AC	intermittent longitudinal cracking along westbound alignment, no gutter along alignment	22-28	Fair
Third Ave and King St	Roundabout	1000-1050	Roundabout grades to the south south-west	AC	Crocodile Cracking along the entry and exit lanes, longitudinal and meandering cracks (previously resealed), minor patching, horizontal cracks	29,30	Poor
King Street	Northbound	1050-1140	Grades south toward roundabout	AC	Crocodile Cracking along the entry and exit lanes, longitudinal and meandering cracks (previously resealed), minor patching	31-34	Poor
King Street	Northbound	1140-1380	Grades gently to the east. No gutters	AC	localised sections of crocodile cracking and longitudinal cracking. Repairs for previous cuts	35,36	Fair
King Street	Northbound	1380-1540	Grade south and north from crest	AC	intermittent longitudinal cracking	-	Good
King Street	Northbound	1540-1730	Grade west to south west	AC	intermittent longitudinal cracking, crocodile cracking and transverse cracking	37-45	Fair
King St and Unnamed Rd	Northbound	1730-1770	Grades east and west	AC	Roundabout, no notable defects	-	Good
Fourth Avenue	Southbound	1770-1860	Grades east and south	AC	No notable defects other than some intermittent longitudinal cracking along the outer wheel path	46	Fair to Good
Unnamed Road	Eastbound	1770-2150	Grades east First Avenue	AC	area appears to be built up by fill, intermittent longtitude cracking up 10 mm wide, mainly in outer wheel path	47-49	Fair to Good
First Avenue	Northbound	0-140	grades south initially then grades north to great western highway	AC	localised longitudinal crack and crocodile cracking in exit lanes	50,51	Fair to Poor
Northern Campus							
Road	Alignment	Chainage	Gradient	Pavement Seal	Defects Description	Photo's	Condition
Second Ave	North bound	0-100	Grades east	AC	break at edge, intermittent longitudinal cracks	60,61	Fair to Good
Second Ave	North bound	100-240	Grades to the east	AC	no kerb and gutter, edge breaks, crocodile cracking, patching	62-66	Poor
Ninth Ave	East bound	240-440	Grades to the east	AC	no kerb and gutter, edge breaks, intermittent longitudinal cracks, potholes	58,59	Fair
Ninth Ave	East bound	450-490	Grades to the east	AC	delamination, crocodile cracking, potholes, edgebreaks	55-57	Poor
First Ave	South Bound	490-640	Generally flat with a slight grade to the east	AC	intermittent longitudinal and horizontal crack	52-54	Good

Appendix E

Laboratory Test Results

Material Test Report



Accredited for compliance with ISO/IEC 17025 - Testing

Signature

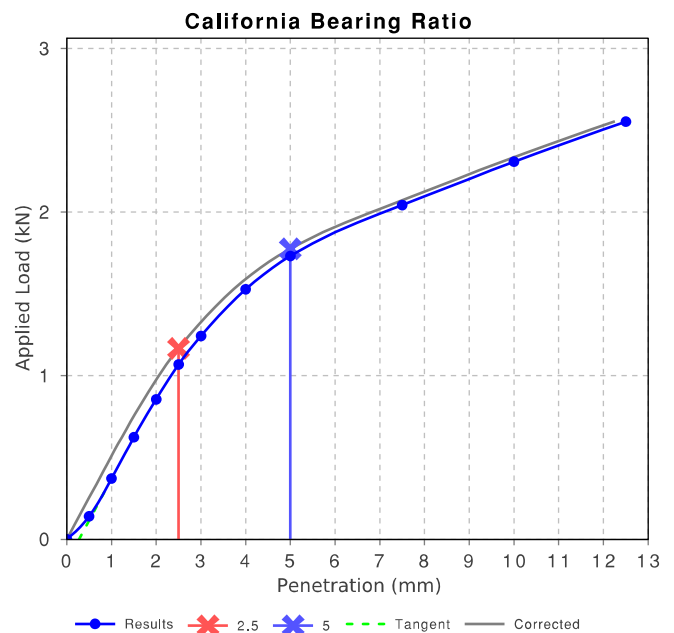
Approved Signatory: Andrew Hutchings

Laboratory Manager

Laboratory Accreditation Number: 828

Report Number: 203407.00-1
Issue Number: 1
Date Issued: 29/06/2021
Client: Cadence Pty Ltd
Level 1/10 Mallett Street, Camperdown NSW 2050
Contact: Priya Mekala
Project Number: 203407.00
Project Name: Proposed Haul Road
Project Location: First Avenue, Werrington South, Werrington
Work Request: 7916
Sample Number: SY-7916A
Date Sampled: 04/06/2021
Dates Tested: 08/06/2021 - 25/06/2021
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH1 (0.4-0.6m)
Material: Sandy CLAY: brown mottled orange-brown, with gravel

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	5 mm		
CBR %	9.0		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.87		
Optimum Moisture Content (%)	15.0		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	96.0		
Dry Density after Soaking (t/m ³)	1.86		
Field Moisture Content (%)	15.8		
Moisture Content at Placement (%)	14.5		
Moisture Content Top 30mm (%)	18.4		
Moisture Content Rest of Sample (%)	16.1		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	116.8		
Swell (%)	0.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	14.8		



Material Test Report



Accredited for compliance with ISO/IEC 17025 - Testing

Andrew Hutchings

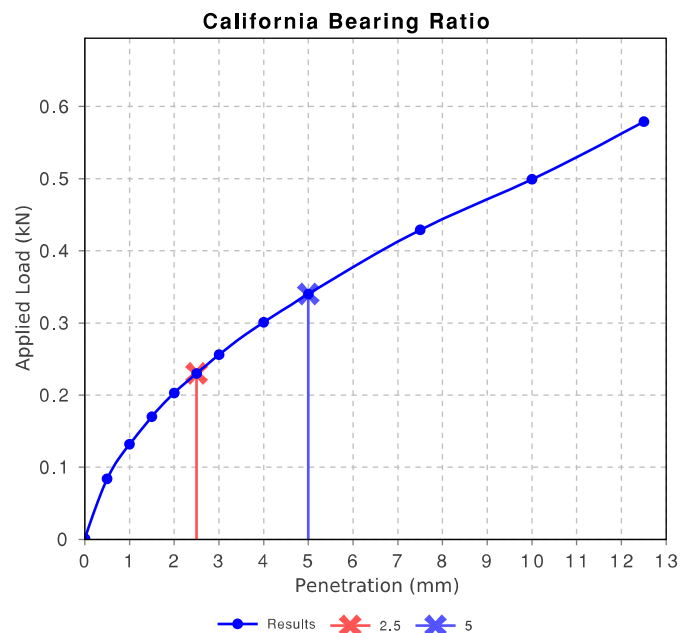
Approved Signatory: Andrew Hutchings

Laboratory Manager

Laboratory Accreditation Number: 828

Report Number: 203407.00-1
Issue Number: 1
Date Issued: 29/06/2021
Client: Cadence Pty Ltd
Level 1/10 Mallett Street, Camperdown NSW 2050
Contact: Priya Mekala
Project Number: 203407.00
Project Name: Proposed Haul Road
Project Location: First Avenue, Werrington South, Werrington
Work Request: 7916
Sample Number: SY-7916B
Date Sampled: 04/06/2021
Dates Tested: 08/06/2021 - 28/06/2021
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH3 (0.4-1.0m)
Material: CLAY: medium to high plasticity, pale grey

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	1.5		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.67		
Optimum Moisture Content (%)	18.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	101.0		
Dry Density after Soaking (t/m ³)	1.60		
Field Moisture Content (%)	23.0		
Moisture Content at Placement (%)	18.5		
Moisture Content Top 30mm (%)	28.2		
Moisture Content Rest of Sample (%)	20.1		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	185.6		
Swell (%)	4.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		
Placement moisture taken using AS1289.2.1.2			



Material Test Report



Accredited for compliance with ISO/IEC 17025 - Testing

Signature

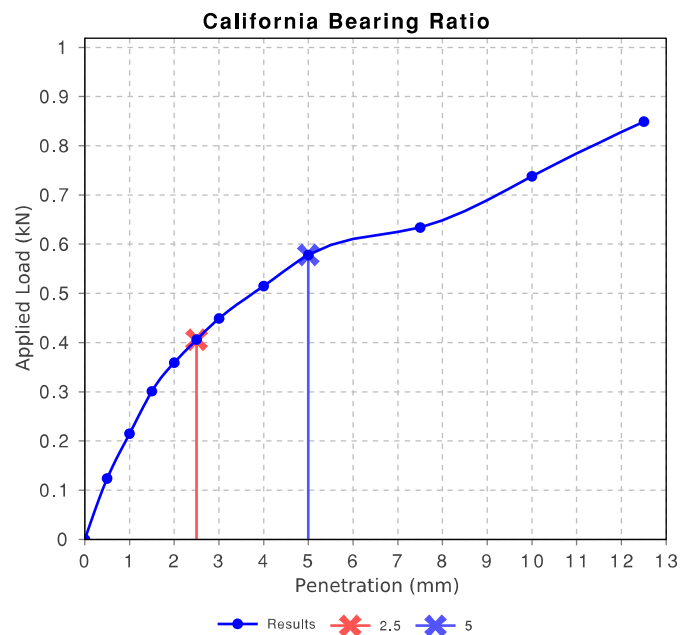
Approved Signatory: Andrew Hutchings

Laboratory Manager

Laboratory Accreditation Number: 828

Report Number: 203407.00-1
Issue Number: 1
Date Issued: 29/06/2021
Client: Cadence Pty Ltd
Level 1/10 Mallett Street, Camperdown NSW 2050
Contact: Priya Mekala
Project Number: 203407.00
Project Name: Proposed Haul Road
Project Location: First Avenue, Werrington South, Werrington
Work Request: 7916
Sample Number: SY-7916C
Date Sampled: 04/06/2021
Dates Tested: 08/06/2021 - 25/06/2021
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH6 (0.5-1.0m)
Material: Silty CLAY: low plasticity, red brown mottled brown

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	3.0		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.62		
Optimum Moisture Content (%)	22.5		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	98.0		
Dry Density after Soaking (t/m ³)	1.58		
Field Moisture Content (%)	22.2		
Moisture Content at Placement (%)	22.0		
Moisture Content Top 30mm (%)	27.6		
Moisture Content Rest of Sample (%)	22.8		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	121.2		
Swell (%)	2.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		
Placement moisture taken using AS1289.2.1.2			



Material Test Report



Accredited for compliance with ISO/IEC 17025 - Testing

Andrew Hutchings

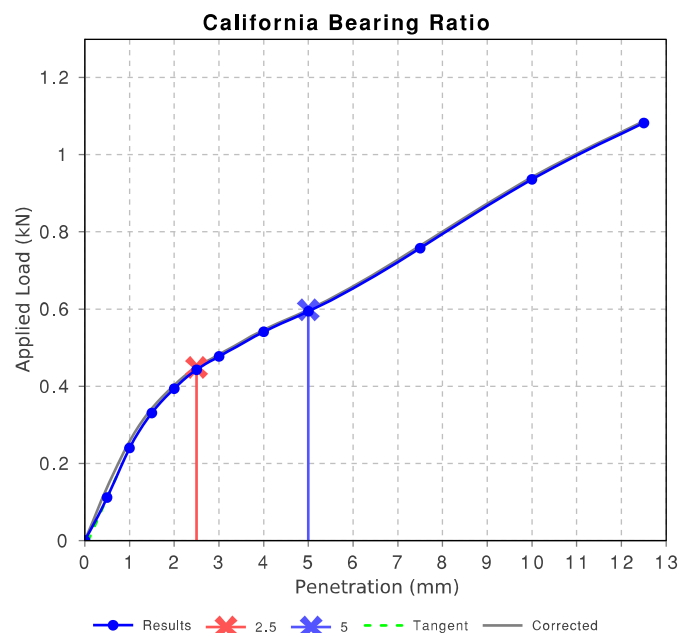
Approved Signatory: Andrew Hutchings

Laboratory Manager

Laboratory Accreditation Number: 828

Report Number: 203407.00-1
Issue Number: 1
Date Issued: 29/06/2021
Client: Cadence Pty Ltd
Level 1/10 Mallett Street, Camperdown NSW 2050
Contact: Priya Mekala
Project Number: 203407.00
Project Name: Proposed Haul Road
Project Location: First Avenue, Werrington South, Werrington
Work Request: 7916
Sample Number: SY-7916D
Date Sampled: 04/06/2021
Dates Tested: 08/06/2021 - 28/06/2021
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH7 (0.4-0.8m)
Material: CLAY: medium to high plasticity, pale grey mottled pale brown

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	3.5		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.71		
Optimum Moisture Content (%)	21.0		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	98.0		
Dry Density after Soaking (t/m ³)	1.68		
Field Moisture Content (%)	23.8		
Moisture Content at Placement (%)	20.6		
Moisture Content Top 30mm (%)	27.9		
Moisture Content Rest of Sample (%)	20.8		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	185		
Swell (%)	2.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



Material Test Report



Accredited for compliance with ISO/IEC 17025 - Testing

Andrew Hutchings

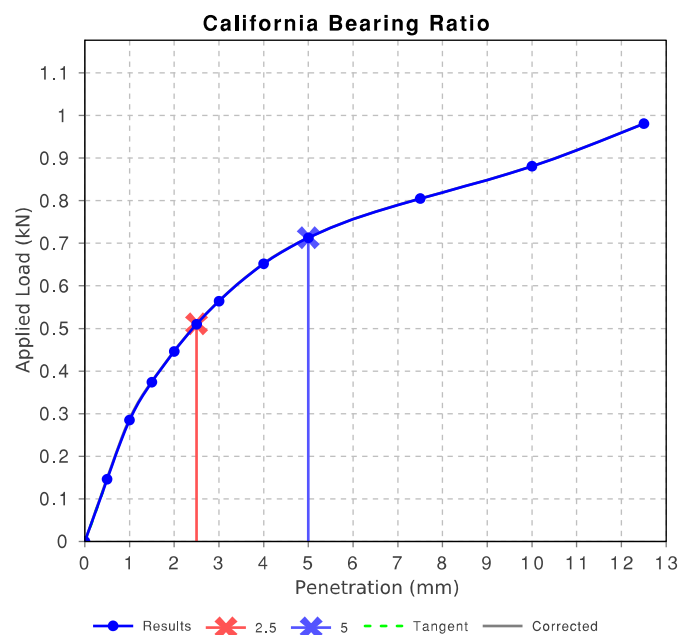
Approved Signatory: Andrew Hutchings

Laboratory Manager

Laboratory Accreditation Number: 828

Report Number: 203407.00-1
Issue Number: 1
Date Issued: 29/06/2021
Client: Cadence Pty Ltd
Level 1/10 Mallett Street, Camperdown NSW 2050
Contact: Priya Mekala
Project Number: 203407.00
Project Name: Proposed Haul Road
Project Location: First Avenue, Werrington South, Werrington
Work Request: 7916
Sample Number: SY-7916E
Date Sampled: 04/06/2021
Dates Tested: 08/06/2021 - 25/06/2021
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: BH8 (0.5-1.0m)
Material: Sandy CLAY: brown mottled red-brown

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	4.0		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Method used to Determine Plasticity	Visual Assessment		
Maximum Dry Density (t/m ³)	1.57		
Optimum Moisture Content (%)	24.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	1.55		
Field Moisture Content (%)	19.5		
Moisture Content at Placement (%)	24.1		
Moisture Content Top 30mm (%)	29.4		
Moisture Content Rest of Sample (%)	25.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	120		
Swell (%)	1.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		



APPENDIX 4- CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB PLAN



TAFE Kingswood Centre of Excellence

Construction Noise and Vibration Sub-Plan

Project No.	P00139
Revision	002
Issued	21 February 2022
Client	ADCO Constructions

E-LAB Consulting

Where science and engineering inspire design.

Document QA and Revisions

ISSUE	DATE	COMMENTS	ENGINEER	REVIEWER
1	14/12/2021	For Coordination	Kanin Mungkarndee	Brandon Notaras
2	21/02/2022	For Coordination	Kanin Mungkarndee	Brandon Notaras
3				
4				

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Authorised by:

E-LAB Consulting



Brandon Notaras | Director, M.AAS

Acoustics & Vibration



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1 INTRODUCTION

This Construction Noise and Vibration Sub-Plan has been prepared for the construction of the proposed Centre of Excellence located at TAFE Kingswood (the site).

Components involved with the works are expected to be:

- Excavation and groundworks of current grass field;
- Foundation works;
- Construction of a 3-storey high building (Centre of Excellence); and
- Landscaping.

This Construction Noise and Vibration Sub-Plan provides:

- Criteria for the noise and vibration generated during the main works
- A quantitative assessment of the airborne and ground-borne noise generated by the work for the proposed development and its impact on nearby receivers
- Strategies to mitigate the noise and vibration generated during the construction works phases
- Complaints handling and community liaison procedures

This assessment discusses the predicted impact of the construction noise and vibration generated by the construction equipment on the nearest most-affected receivers.

This report has been prepared with the following references:

- Interim Construction Noise Guideline (ICNG), NSW DECC, 2009;
- Construction Noise Strategy, Transport for NSW, 2013;
- Noise Policy for Industry (NPI), NSW EPA, 2017;
- Assessing Vibration: A Technical Guideline, NSW DEC, 2006;
- AS 2436:2010 *Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites*;
- British Standard BS 5228: Part 1:1997 *Noise and Vibration Control on Construction and Open Sites*;
- British Standard BS 7358:1993 *Evaluation and Measurement for Vibration in Buildings – Part 2: Guide to Damage Levels from Ground-borne Vibration*; and
- German Standard DIN 4150-Part 3 *Structural vibration in buildings – Effects on structures*.

The predicted noise levels are based on the proposed construction program and equipment lists provided in this report.

Additionally, this document has been specifically prepared to address Condition B12 of the Development Consent. A summary of the Condition B12 and where all components of this condition are addressed within this report is provided in Table 1.



Table 1: Condition B12 – Location where parts of condition are addressed

CONDITION B12, PART	SECTION IN THIS REPORT
(a) be prepared by a suitably qualified and experienced noise expert	M.AAS (Member of Australian Acoustical Society)
(b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline	Section 6
(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity	Section 6.1.1, 6.2.1 and 6.3
(d) include a complaints management system that would be implemented for the duration of the construction; and	Section 6.2.3
(e) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the implemented management measures in accordance with the requirements of condition B13	Section 6.3.4

2 PROJECT DESCRIPTION

2.1 SITE DESCRIPTION AND NOISE & VIBRATION SENSITIVE RECEIVERS

For the purposes of this Construction Noise and Vibration Sub-Plan, the site location, measurement positions (conducted by Norman Disney & Young in report *Acoustics Services – Noise and Vibration Impact Assessment*, dated 10 March 2021) and surrounding noise and vibration sensitive receivers are shown in Figure 1 and .

Figure 1: Overview of the site and surrounding sensitive receivers (source: Google Maps)



Figure 2: Monitoring locations conducted by Norman Disney & Young (source: report Acoustics Services – Noise and Vibration Impact Assessment, dated 10 March 2021)



3 BACKGROUND AND AMBIENT NOISE MONITORING

Long-term noise monitoring was conducted by Norman Disney & Young in report *Acoustics Services – Noise and Vibration Impact* Assessment, dated 10 March 2021 (locations presented in Figure 2). Background noise levels and subsequent Rating Background Noise Level (RBL) have been extracted from this report, which have been established in accordance with the Noise Policy for Industry 2017.

The description of time of day is outlined within the Noise Policy for Industry and described as follows:

- Day – the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays
- Evening – the period from 6pm to 10pm
- Night – the remaining periods

Table 2: Unattended noise monitoring results (conducted by Norman Disney & Young)

LOCATION	MEASURED RATING BACKGROUND NOISE LEVELS (RBL) - dB(A)		
	DAY	EVENING	NIGHT
Logger 1	41	41	35
Logger 2	41	41	38
Logger 3	43	41	39
Logger 4	39	41	35
Logger 5	44	41	35

4 PROJECT NOISE AND VIBRATION CRITERIA

4.1 CONSTRUCTION NOISE CRITERIA

Airborne Noise – Residential Receivers

The airborne noise criteria for surrounding residential receivers have been extracted from Table 2 in the ICNG and is presented in Table 3 below.

Table 3: NSW ICNG construction noise criteria for surrounding residential receivers

TIME OF DAY	MANAGEMENT LEVEL $L_{Aeq,15min}^1$	HOW TO APPLY
Recommended Standard Hours: Monday – Friday 7am – 6pm	Noise Affected RBL + 10dB	<p>The noise-affected level represents the point above which there may be some community reaction to noise.</p> <ul style="list-style-type: none"> Where the predicted or measured $L_{Aeq,15min}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residences of the nature of works to be carried out, the expected noise levels and duration as well as contact details.
Saturday 8am – 1pm No work on Sundays or public holidays	Highly Noise Affected 75 dB(A)	<p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <ul style="list-style-type: none"> Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur in, taking into account: <ul style="list-style-type: none"> Times identified by the community when they are less sensitive to noise (such as before and after school, for works near schools, or mid-morning or mid-afternoon for works near residences) If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside Recommended Standard Hours	Noise Affected RBL + 5dB	<ul style="list-style-type: none"> The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2.

Note 1: Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Airborne Noise – Educational Receivers

Table 4 below (extracted from Section 4.1.2 of the ICNG) sets out the noise management levels for other land uses, including educational institutions. Internal noise levels are to be assessed at the centre of the occupied room. External noise levels are to be assessed at the most affected point within 50m of the area boundary. Where internal noise levels cannot be measured, external noise levels may be used. A conservative estimate of the difference between internal and external noise levels is 10 dB for buildings other than residences.

Table 4: NSW ICNG construction noise criteria for surrounding educational receivers

RECEIVER TYPE	MANAGEMENT LEVEL (APPLIES WHEN PROPERTIES ARE BEING USED) $L_{Aeq,15min}$, dB(A)
Educational Institutes	45 (internal) 55 (external)

Based on the criteria in the tables above, the following noise management levels in Table 5 should be applied to the surrounding residential and educational receivers when appropriate. Construction during standard hours has been assumed.

Table 5: Project specific construction noise management levels (external noise level)

LAND USE	RECEIVER	NOISE MANAGEMENT LEVEL, $L_{Aeq,15min}$	HIGHLY NOISE AFFECTED LEVEL $L_{Aeq,15min}$
Residential	RC1	41 dB(A) + 10 dB = 51 dB(A)	75 dB(A)
	RC2	44 dB(A) + 10 dB = 54 dB(A)	
	RC3	39 dB(A) + 10 dB = 49 dB(A)	
Educational	RC4	55 dB(A)	N/A

4.2 CONSTRUCTION VIBRATION CRITERIA

4.2.1 Human Comfort

The office of Environment and Heritage (OEH) developed a document, “Assessing vibration: A technical guideline” in February 2006 to assist in preventing people from exposure to excessive vibration levels from construction and operation of a development within buildings. The guideline does not however address vibration induced damage to structures or structure-borne noise effects. Vibration and its associated effects are usually classified as continuous, impulsive or intermittent.

Continuous and Impulsive Vibration

Structural vibration in buildings can be detected by occupants and can affect them in many ways including reducing their quality of life and also their working efficiency. Complaint levels from occupants of buildings subject to vibration depend upon their use of the building and the time of the day.

Maximum allowable magnitudes of building vibration with respect to human response are shown in Table 6. It should be noted that the human comfort for vibration is more stringent than the building damage criteria.

Table 6: Preferred and maximum weighted RMS values for continuous and impulsive vibration acceleration (m/s^2) 1-80 Hz

LOCATION	ASSESSMENT PERIOD ¹	PREFERRED VALUES		MAXIMUM VALUES	
		z-axis	x- and y-axes	z-axis	x- and y-axes
Continuous vibration					
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day- or night time	0.020	0.014	0.040	0.028
Impulsive vibration					
Residences	Daytime	0.30	0.21	0.60	0.42
	Night time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day- or night time	0.64	0.46	1.28	0.92

Note 1: Daytime is 7:00am to 10:00pm and night time is 10:00pm to 7:00am

Intermittent Vibration Criteria

Disturbance caused by vibration will depend on its duration and its magnitude. This methodology of assessing intermittent vibration levels involves the calculation of a parameter called the Vibration Dose Value (VDV) which is used to evaluate the cumulative effects of intermittent vibration. Various studies support the fact that VDV assessment methods are far more accurate in assessing the level of disturbance than methods which is only based on the vibration magnitude.

Table 7: Acceptable vibration dose values for intermittent vibration ($m/s^{1.75}$)

LOCATION	DAYTIME ¹		NIGHT-TIME ¹	
	PREFERRED VALUE	MAXIMUM VALUE	PREFERRED VALUE	MAXIMUM VALUE
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80

Note 1: Daytime is 7:00am to 10:00pm and night time is 10:00pm to 7:00am

4.2.2 Cosmetic Damage

Structural vibration thresholds are set to minimize the risk of cosmetic surface cracks and lie below the levels that have the potential to cause damage to the main structure. Table 8 presents guide values for building vibration, based on the vibration thresholds above which cosmetic damage has been demonstrated outlined within BS7385-Part 2:1993. These values are evaluated to give a minimum risk of vibration-induced damage, where minimal risk for a named effect is usually taken as 95% probability of no effect.

Table 8: Transient vibration guide values for cosmetic damage – BS 7385-2:1993

TYPE OF BUILDING	PEAK PARTICLE VELOCITY IN FREQUENCY RANGE OF PREDOMINANT PULSE (PPV)	
	4 Hz TO 15 Hz	15 Hz AND ABOVE
Reinforced or framed structures Industrial or light commercial type buildings	50mm/s	N/A
Unreinforced or light framed structures Residential or light commercial type buildings	15mm/s	20mm/s (50mm/s at 40Hz and above)

4.2.3 Structural Damage

Ground vibration criteria is defined in terms of the levels of vibration emission from the construction activities which will avoid the risk of damaging surrounding buildings or structures. It should be noted that human comfort criteria are normally expressed in terms of acceleration whereas structural damage criteria are normally expressed in terms of velocity.

Most specified structural vibration levels are defined to minimize the risk of cosmetic surface cracks and are set below the levels that have the potential to cause damage to the main structure. Structural damage criteria are presented in German Standard DIN4150-Part 3 "Structural vibration in buildings – Effects on structures" and British Standard BS7385-Part 2: 1993 "Evaluation and Measurement for Vibration in Buildings". Table 9 indicates the vibration limits presented in DIN4150-Part 3 to ensure structural damage doesn't occur.

Table 9: Guideline value of vibration velocity, v_i , for evaluating the effects of short-term vibration – DIN4150-3

LINE	TYPE OF STRUCTURE	VIBRATION VELOCITY, V_i , IN mm/s			
		FOUNDATION			PLANE OF FLOOR OF UPPERMOST FULL STOREY
		AT A FREQUENCY OF			
		LESS THAN 10HZ	10 TO 50HZ	50 TO 100HZ*	ALL FREQUENCIES
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that, because of their particular sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8
*For frequencies above 100Hz, at least the values specified in this column shall be applied					

5 CONSTRUCTION NOISE ASSESSMENT

5.1 PROPOSED CONSTRUCTION ACTIVITIES

In this assessment, the noise impact from the main works are considered, which are expected to consist of the following stages:

- Excavation and ground works; and
- Building foundation and construction above ground.

The hours of work are expected to occur during standard daytime hours, as follows:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sunday and public holidays: no work

5.2 EXPECTED CONSTRUCTION EQUIPMENT

The noise sources likely to be associated with the works listed in the previous section of this report are presented in Table 10. The equipment noise levels have been extracted from AS2436:2010 “Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites” and the “Construction Noise Strategy, Transport for NSW, 2013”. These equipment noise levels are provided as sound power levels (in-line with the documents referenced above) and are the estimated sound power emitted by the equipment, which differs to the sound pressure level rated for equipment at a particular distance.

Table 10: Construction equipment noise levels

STAGES	EQUIPMENT	QUANTITY	SOUND POWER LEVEL – dB(A)	ACOUSTICAL USAGE FACTOR (%)	USAGE IN 15-MINUTE PERIOD (MINUTES)	TIME CORRECTED SOUND POWER LEVEL– dB(A) $L_{Aeq,15min}$
Excavation and ground works	Powered hand tool	4	102	50	7.5	99
	Excavator 30 tonne	1	110	40	6	106
	Excavator breaker	1	115	40	6	111
	Bobcat	1	107	70	10.5	105
	Dump truck	2	108	40	6	104
Building foundation and construction above ground	Powered hand tool	10	102	50	7.5	99
	Concrete pump	1	109	50	7.5	106
	Concrete Truck	1	108	50	7.5	105
	Generator	1	104	20	3	97
	General Truck	2	104	40	6	100
	Mobile Crane	1	110	16	2.4	102

5.3 NOISE MODELLING AND ASSUMPTIONS

In order to assess the noise impact from the site during the various construction stages, a noise model was prepared using commercial software SoundPLAN v8.2, which is a comprehensive software package for conducting three-dimensional complex noise propagation modelling. Using the software, a 3D model of the site and its surroundings was constructed including the nearby buildings, and the construction plant and equipment were positioned as noise sources. Within the model, the effects of the environment (built and natural) on propagation of sound were considered to reliably estimate the resulting noise effects on the surrounding noise sensitive receivers.

The noise model represents the 'reasonable' worst case periods of construction activities, meaning that all the equipment of each stage is operating simultaneously during a 15-minute observation period.

The assumptions that were made within the assessment include the following:

- The predicted noise levels represent the worst-case scenario for each receiver;
- The predicted noise levels at the receivers have been assessed at a height of 1.5m above ground level in accordance with the assessment procedures of the ICNG.
- The mitigation measures outlined in Section 6 are implemented; and
- Neutral weather conditions;

5.4 PREDICTED NOISE LEVELS

The predicted noise levels have been presented in Table 11 and Table 12 have been assessed to the construction noise criteria established in Section 4.1.

Table 11: Predicted noise levels – excavation and ground works

ID	RECEIVER TYPE	PREDICTED NOISE LEVEL RANGE L _{Aeq,15min} dB(A)	NOISE MANAGEMENT LEVEL L _{Aeq,15min} dB(A)	NOISE MANAGEMENT LEVEL EXCEEDANCE dB	EXCEEDS HIGHLY NOISE AFFECTED LEVEL (YES/NO)
RC1	Residential	< 49	51	0	No
RC2	Residential	< 49	54	0	No
RC3	Residential	< 49	49	0	No
RC4	Educational	58 – 61	55	3 – 6	N/A

Table 12: Predicted noise levels – building foundation and construction above ground

ID	RECEIVER TYPE	PREDICTED NOISE LEVEL RANGE L _{Aeq,15min} dB(A)	NOISE MANAGEMENT LEVEL L _{Aeq,15min} dB(A)	NOISE MANAGEMENT LEVEL EXCEEDANCE dB	EXCEEDS HIGHLY NOISE AFFECTED LEVEL (YES/NO)
RC1	Residential	< 49	51	0	No
RC2	Residential	< 49	54	0	No
RC3	Residential	< 49	49	0	No
RC4	Educational	58 – 61	55	3 – 6	N/A

6 CONSTRUCTION NOISE & VIBRATION MITIGATION MEASURES

6.1 PROJECT SPECIFIC RECOMMENDATIONS

Project specific recommendations and required mitigation methods have been listed below within Section 6.1. For general noise and vibration mitigation and management measures, refer to Section 6.2 of this report.

6.1.1 Noise

The receivers which can be considered as most affected are the educational buildings (RC4) due to their close proximity to the site.

It is recommended a respite period of minimum one hour, for example between 12:00pm – 1:00pm (or other period to coincide with construction workers lunch time(s)), should be offered per day during the most intensive periods of hammering and rock breaking. Frequent and proactive communication with the educational institute (Western Sydney University) is also encouraged, that being receiver RC4. This will allow occupiers of the educational facility to tune their schedules to accommodate possible noise sensitive meetings or classes. More details regarding communication with the community can be found in Section 6.2.3.

6.1.2 Vibration

The highest vibration inducing activities are predicted to be rock breaking (if required). The most-affected receiver is expected to be RC4, being the closest receivers to the project site. Vibration levels at RC4 aren't expected to exceed structural damage criteria (Section 4.2.3) as there is a reasonable distance from the closest façade of the receiver to the proposed structure (approx. min. 50m distance).

If vibration intensive activities (such as rock breaking) are to occur along the eastern boundary, attended vibration measurements should be conducted to determine if there is an exceedance of the vibration limits set out in Section 4.2.

Upon any exceedances in vibration levels, reasonable and feasible measures should be considered to lessen the impact, such as alternative methods or equipment for rock breaking to achieve the vibration levels required.

To further diminish the vibration impact, the one-hour respite period, for example between 12:00pm – 1:00pm (or other period to coincide with construction workers lunch time(s)), recommended for noise mitigation shall also apply for vibration mitigation.

6.2 GENERAL ACOUSTIC RECOMMENDATIONS FOR CONSTRUCTION

According to AS 2436 – 2010 “Guide to noise and vibration control on construction, demolition and maintenance sites” the following techniques could be applied to minimize the spread of noise and vibrations to the potential receivers.

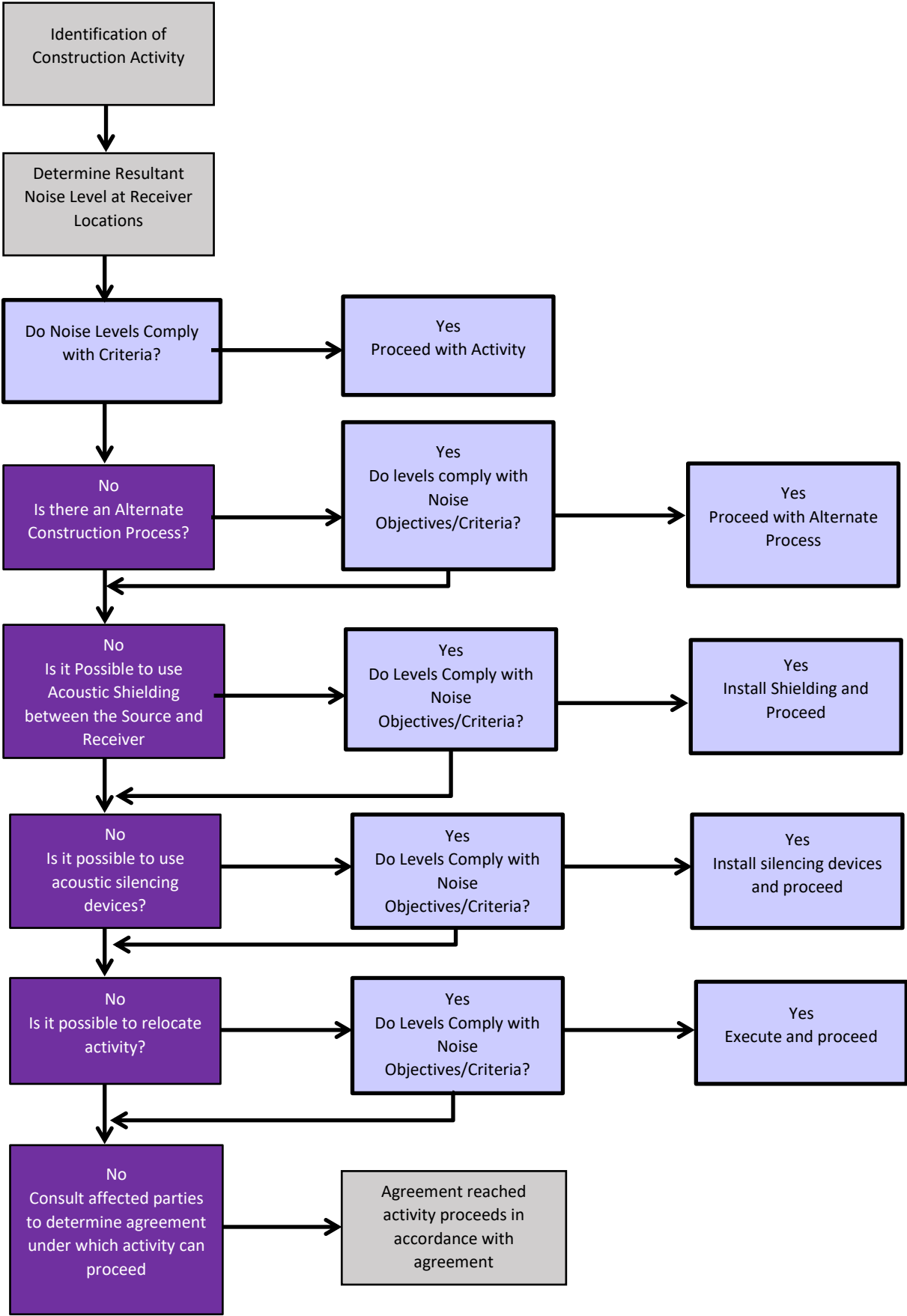
6.2.1 Noise

Figure 3 demonstrates the preferred order of actions taken to mitigate excessive construction noise emissions. If a process that generates significant noise levels cannot be avoided, the amount of noise reaching the receiver should be minimized. Two ways of achieving this are to either increase the distance between the noise source and the receiver or to introduce noise reduction measures such as screens. Practices that will reduce noise from the site include:

- Increasing the distance between noise sources and sensitive receivers.
- Reducing the line-of-sight noise transmission to residences or other sensitive land uses using temporary barriers (stockpiles, shipping containers and site office transportables can be effective barriers).
- Constructing barriers that are part of the project design early in the project to introduce the mitigation of site noise.
- Installing purpose-built noise barriers, acoustic sheds and enclosures.

Physical methods to reduce the transmission of noise between the site works and residences, or other sensitive land uses, are generally suited to works where there is longer-term exposure to the noise. A few of these methods have been introduced below.

Figure 3: Noise mitigation management flow chart



Screening

On sites where distance is limited, screening of noise may be beneficial or even the only way to reduce construction noise impacts on the nearby receivers. Below, screening options for various situations have been introduced. Constructing and utilising these screening methods should be taken into account already during the planning stages.

Temporary buildings: One option to introduce screening is to position structures such as stores, storage piles, site offices and other temporary buildings between the noisiest part of the site and the nearest dwellings. Due to shielding provided by these buildings, some of the noise emission from the site can be reduced. If the buildings are occupied, however, sound insulation measures may be necessary to protect site workers inside the buildings.

Hoarding: Another way of implementing screening is to build hoarding that includes a site office on an elevated structure. This option offers superior noise reduction when compared with a standard, simple hoarding. The acoustic performance is further enhanced when the hoarding is a continuous barrier.

Equipment operating 24h: When it comes to water pumps, fans and other plant equipment that operate on a 24-hour basis, they may not be an irritating source of noise during the day but can be problematic at night. They should therefore be effectively screened by either situating them behind a noise barrier or by being positioned in a trench or a hollow in the ground. Again, generated reverberant noise must be minimised and adequate ventilation should be ensured.

General remarks: In many cases, it is not practical to screen earthmoving operations effectively, but it may be possible to partially shield a construction plant at the early stages of the project with protective features required to screen traffic noise.

The usefulness of a noise barrier will depend upon its length, its height, its position relative to the source and the receiver, and the material of which it is made. A barrier designed to reduce noise from a moving source should extend beyond the last property to be protected by at least ten times the shortest distance from the said property to the barrier. A barrier designed to reduce noise from a stationary source should, where possible, extend beyond the direct line of sight between the noise source and the receiver by a distance equal to ten times the effective barrier height, which is the height above the direct line between source and receiver.

If the works are already predominantly located within nominally closed structures, careful consideration should be given to reducing noise breakout at any openings.

Cranes

For the early works construction phases, any craneage will be limited to mobile cranes where the engines are typically enclosed in an acoustically treated housing.

Reversing and warning alarms

Community complaints often involve the intrusive noise of alarms commonly used to provide a safe system of work for vehicles operating on a site. Beeper reversing alarm noise is generally tonal and may cause annoyance at significant distances from the work site.

There are alternative warning alarms capable of providing a safe system of work that are equal to or better than the traditional “beeper”, while also reducing environmental noise impacts. The following alternatives should be considered for use on construction sites as appropriate:

- Broadband audible alarms incorporating a wide range of sound frequencies (as opposed to the tonal-frequency ‘beep’) are less intrusive when heard in the neighbourhood.
- Variable-level alarms reduce the emitted noise levels by detecting the background noise level and adjusting the alarm level accordingly.
- Proximity alarms that use sensors to determine the distance from objects, such as people or structures, and generate an audible alarm in cabin for the driver.
- Spotters or observers.

The above methods should be combined, where appropriate.



6.2.2 Vibration

Vibration can be more difficult to control than noise, and there are few generalizations that can be made about its control. It should be kept in mind that vibration may cause disturbance by causing structures to vibrate and radiate noise in addition to perceptible movement. Impulsive vibration can, in some cases, provide a trigger mechanism that could result in the failure of building components that had previously been in a stable state.

During the excavation works and the erection of new structures, some vibrations (transmitted through the structure from the demolition sites) are expected, being more of a concern for the surrounding sensitive receivers. Vibrations can also trigger annoyance, which might get elevated into action by occupants of exposed buildings and should therefore be included in the planning of communication with impacted communities.

It should be remembered that failures, sometimes catastrophic, can occur as a result of conditions not directly connected with the transmission of vibrations, e.g. the removal of supports from retaining structures to facilitate site access. BS 7385-2 provides more information on managing ground-borne vibration and its potential effects on buildings. Where site activities may affect existing structures, a thorough engineering appraisal should be made at the planning stage.

General principles of seeking minimal vibration at receiving structures should be followed in the first instance. Predictions of vibration levels likely to occur at sensitive receivers are recommended when they are relatively close, depending on the magnitude of the source of the vibration or the distance associated. Relatively simple prediction methods are available in textbooks, codes of practice and standards, however, it is preferable to assess site transmission and propagation characteristics between source and receiver locations through measurements.

Guidance for measures available for the mitigation of vibration transmitted can be sought in more detailed standards, such as BS 5228-2 or policy documents, such as the NSW DEC *Assessing Vibration: A technical guideline*. Identifying the strategy best suited to the control of vibration follows a similar approach to that of noise: avoidance, control at the source, control along the propagation path, control at the receiver, or a combination of these. It is noted that vibration sources can include stationary plants (pumps and compressors), portable plants (jackhammers and pavement vibrators), mobile plants, pile-drivers, tunnelling machines and activities, and blasting, amongst others. Unusual ground conditions, such as a high water-table, can also cause a difference to expected or predicted results, especially when considering the noise propagated from piling.

6.2.3 Complaint Handling Procedures and Community Liaison

It is recommended that the builder directly contact adjacent noise sensitive receivers and provide them with the following information:

- The contact details for a nominated representative in order to make noise / vibration complaints.
- Explain the timeframe for the construction works and the proposed activities, i.e. the proposed start / stop dates of work and a description of the noise producing equipment that will be used.
- Notify the noise sensitive receivers and Penrith City Council in a timely manner should there be any need for an extension to the proposed arrangements.
- Provide them with a copy of this report as approved by the Penrith City Council.
- Penrith City Council should be notified of the nature and details of complaints received (time, complainant etc.) and what remedial action has taken place, if any.
- Where noise is demonstrated as being compliant with criteria, this should not limit the proponent in undertaking further additional reasonable and feasible steps to reduce noise emissions.

To assist in the management of noise and vibration complaints various procedures are to be followed. These include:

- Clearly visible signage identifying any key personnel along with their contact details to be erected along the perimeter of the building site including a 24-hour contact name, phone number and email address provided for the resident to address any complaint. The signage will declare; “For any enquiry, complaint or emergency relating to this site at any time please contact...”
- Give complaints a fair hearing.
- Have a documented complaints process, including an escalation procedure so that if a complaint is not satisfied there is a clear path to follow.
- Call back as soon as possible to keep people informed of action to be taken to address noise problems. Call back at night time only if requested by the complainant to avoid further disturbance.
- Implement all feasible and reasonable measures to address the source of the complaint.
- A register is to be kept by the contractor to keep a record of complaints and detail any information associated with them. The contents of the register will include:
 - The name and the address of the complainant
 - Time and date of the complaint
 - The nature of the complaint (Noise/Vibration)
 - Subsequent details
 - Remedial action undertaken

The contents of the register will be maintained and updated with any new complaint without delay. The complaints will be reported to both Penrith City Council and the Contractor. The investigation of the complaint and any remedial actions will be performed by the builder and/or client representative.

In the event of noisy works scheduled, the builder will notify residents 5 business days in advance.

6.3 NOISE & VIBRATION MONITORING STRATEGY

6.3.1 General Methodology

Noise and vibration levels should be monitored from time to time to ensure that noise generated as a result of remediation and construction activities does not disturb local businesses and residents.

Monitoring may be in the form of regular checks by the builder or indirectly by an acoustic consultant engaged by the builder and in response to any noise or vibration complaints. Where noise and vibration criteria are being exceeded or in response to valid complaints, noise and / or vibration monitoring should be undertaken. This would be performed inside the premises of the affected property and on site adjacent to the affected receivers.

Monitoring is to be undertaken by an experienced noise and vibration monitoring professional or an acoustic consultant. The results of any noise or vibration monitoring are to be provided to the relevant party or person in a timely manner allowing the builder to address the issue and respond to the complaints.

Noise and vibration monitoring can take two forms:

- Short-term monitoring
- Long-term monitoring

Both of these approaches are elaborated below.

6.3.2 Short-term Monitoring

Short-term monitoring consists of attended monitoring when critical stages of the construction are occurring. This normally provides real-time assistance and guidance to the subcontractor on site, telling them when the noise and vibration criteria are exceeded. Thus, the selection of alternative method on construction or equipment selection is allowed in order to minimise noise and vibration impacts.

6.3.3 Long-term Monitoring

Similarly, to short-term monitoring, long-term monitoring provides real-time alerts to the builder / site manager when the noise and vibration criteria are exceeded. Instead of someone being on site measuring, noise and vibration loggers are used.

Typically, the noise and vibration loggers stay on site for a period of several months for the critical construction stages of the project, such as the demolition and excavation phases.

Both methodologies are complementary and normally used simultaneously providing a significant amount of data via the long-term monitoring, but also providing information on the sources of noise and vibration generating exceedances via the short-term or attended monitoring.

6.3.4 Noise & Vibration Monitoring Program

A monitoring program for the main work is proposed in Table 13. The monitoring program is to be carried out during the most intrusive activities (such as rock breaking) as agreed with the Acoustic engineer and Contractor.

Table 13: Noise and vibration monitoring program

RECEIVER LOCATION	PROPOSED MONITORING TYPE AND PHASE
RC4	Noise – Excavation Works
	Vibration – Excavation Works

7 CONCLUSION

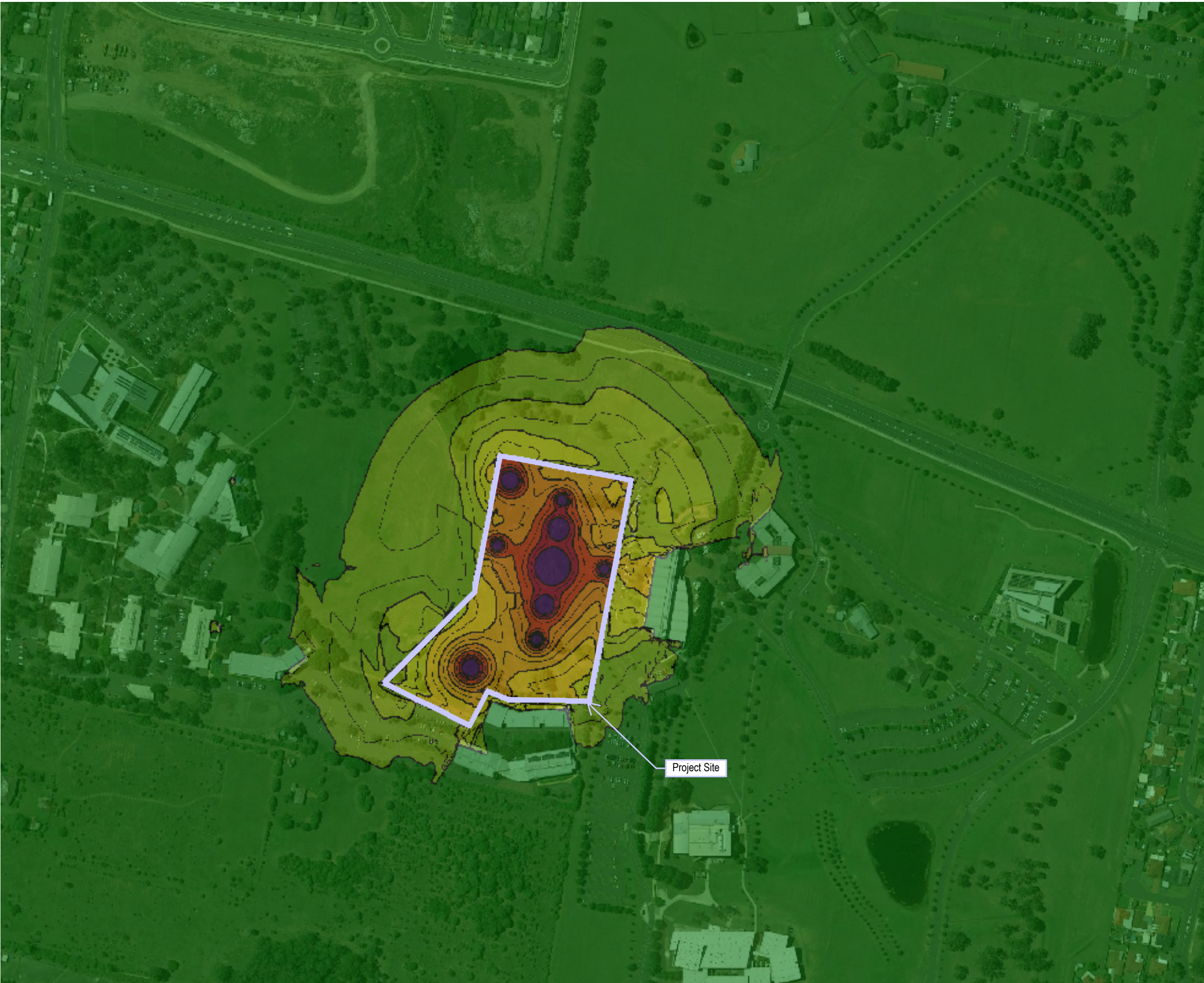
A Construction Noise and Vibration Sub-Plan has been provided for the construction of the proposed Centre of Excellence located at TAFE Kingswood.

The details of the noise and vibration modelling and assessment undertaken to predict the impacts on sensitive receivers have been presented in Sections 5.

To reduce the noise and vibration impacts on the sensitive receivers, noise and vibration management strategies have been proposed in Section 6.

The information presented in this report shall be reviewed if any modifications to the features of the development specified in this report occur, including and not restricted to selection of equipment/machinery and modifications to the construction program.

Appendix A **Construction Noise Emissions Modelling**



E-LAB CONSULTING

ISSUE	DATE	STATUS
1	14/12/2021	For Coordination
2	21/02/2022	For Coordination

LEGEND	
Noise Level - $L_{max,10m}$	dB(A)
< 49	Green
49 - 52	Light Green
52 - 55	Yellow-Green
55 - 58	Yellow
58 - 61	Orange-Yellow
61 - 64	Orange
64 - 67	Red-Orange
67 - 70	Red
70 - 73	Dark Red
≥ 73	Purple

NOTES

PROJECT
TAPE KINGSWOOD - CENTRE OF EXCELLENCE

PROJECT NO.
P00139

ARCHITECT
GRAY PUKSAND

CLIENT
ADCO

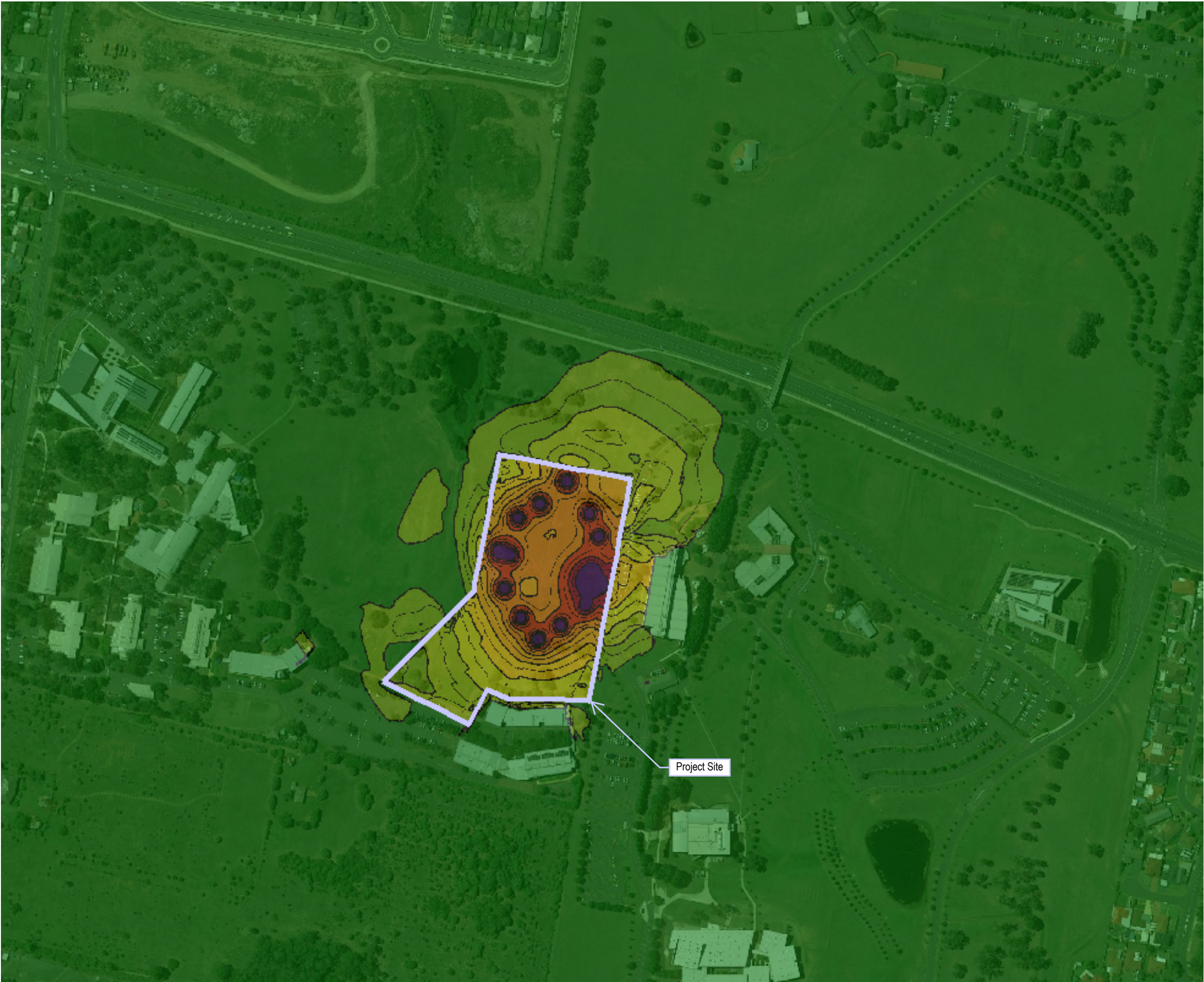
SCALE
NTS

STATUS
FOR COORDINATION

DRAWING
NOISE EMISSIONS CONTOUR MAP
EXCAVATION AND GROUND WORKS

DISCIPLINE
ACOUSTICS AND VIBRATION

DRAWING NUMBER	REVISION
AC-DWG-100-02-02	002



Project Site



E-LAB CONSULTING

ISSUE	DATE	STATUS
1	14/12/2021	For Coordination
2	21/02/2022	For Coordination

LEGEND	
Noise Level - $L_{max,10m}$ dB(A)	
< 49	Green
49 - 52	Light Green
52 - 55	Yellow-Green
55 - 58	Yellow
58 - 61	Orange-Yellow
61 - 64	Orange
64 - 67	Red-Orange
67 - 70	Red
70 - 73	Dark Red
≥ 73	Purple

NOTES

PROJECT
TAPE KINGSWOOD - CENTRE OF EXCELLENCE

PROJECT NO.
P00139

ARCHITECT
GRAY PUKSAND

CLIENT
ADCO

SCALE
NTS

STATUS
FOR COORDINATION

DRAWING
NOISE EMISSIONS CONTOUR MAP
FOUNDATION AND CONSTRUCTION

DISCIPLINE
ACOUSTICS AND VIBRATION

DRAWING NUMBER
AC-DWG-100-04-02

REVISION
002



APPENDIX 5- CONSTRUCTION WASTE MANAGEMENT SUB PLAN

PEOPLE WHO BUILD

WASTE MANAGEMENT PLAN

PROJECT NAME

**TAFE NSW INSTITUTE OF APPLIED
TECHNOLOGY FOR CONSTRUCTION**

PROJECT NO

3547

REVISION

003

WASTE MANAGEMENT PLAN



VERSION CONTROL

Rev. No.	Issue Date	Approved By	Position	Details
001	01/12/21	Pierce Brennan	Project Manager	Initial Plan
002	16/03/22	Pierce Brennan	Project Manager	ADCO Personnel Update
03	17/08/22	Pierce Brennan	Project Manager	General Review and Update

ADCO PROJECT PERSONNEL CONSULTATION AND SIGN OFF

We, the undersigned, confirm that we have been consulted on the contents of this document providing opportunity for input. The undersigned is to confirm that I have read and understood the contents of this document and agree to implement the requirements of this Plan on this project site.

Note: acknowledgment can also be confirmed through a toolbox meeting documented through Hammertech.

Name	Position	Acknowledgment
Simon Brown	Site Manager	
George Balliotis	Site Foreman	
Rob Torchia	Site Foreman	
Kieran Hill	Project Engineer	
Matthew Olszewski	Project Engineer	
George Awad	Project Engineer	
Russell Eccles	HSE Advisor	
Andrew Roman	Services Manager	
Jed Nicholl	Senior Contract Administrator	
Rami Mehzer	Contract Administrator	
Nick Moldrich	Senior Design Manager	
Harrison Crouch	Cadet- CA	
Mark Zabica	Cadet- Engineer	

WASTE MANAGEMENT PLAN



Tyler Barker	Construction Worker	
Nick Meagher	Construction Worker	
Darrell Price	Construction Worker	
Max Evans	Apprentice	
Dean Israel	Construction Manager	
Pierce Brennan	Project Manager	

WASTE MANAGEMENT PLAN



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WASTE MANAGEMENT PLAN



GENERAL

PRINCIPAL CONTRACTORS DETAILS

Name	State Address		ABN
ADCO Constructions Pty Ltd	Address	Level 2, 7-9 West Street	46 001 044 391
	Suburb	North Sydney	
	State	NSW	
	Phone	02 8437 5000	

PROJECT INFORMATION

Project Description	The TAFE NSW IATC will comprise a 3 level construction (lower ground, Upper ground & level 1) with internal workshops, café, learning areas, amenities, storage in the lower ground, Amenities, industry engagement and staff kitchen in the upper ground and level 1.
	The development includes an additional carpark and provides services for a projected 3500 student enrolment, encompassing various construction disciplines.
	The project is on an existing field of the NSW TAFE Nepean campus, adjacent to the WSU Werrington South Campus.
Project Address	12-44 O'Connell St, Kingswood 2747
Project Duration	October 2021- April 2023
Separable Portions	Nil

WASTE MANAGEMENT PLAN



INTRODUCTION

PURPOSE OF THIS PLAN

This Management Plan has been produced for the following purposes:

- / Compliance to legislation.
- / Establishment of objectives for the project.
- / Identification of risks and the control measures to be used to mitigate such risks.
- / Subcontractor management requirements.
- / Other EHS management requirements as required for this project.

PROJECT WASTE MANAGEMENT

ON SITE MANAGEMENT	General	<ul style="list-style-type: none">/ Waste products will be recycled wherever possible./ Waste bins will be provided and emptied regularly to ensure that the site is kept clean./ General construction waste will be stored in skip bins at a nominated area on site./ Waste that is unsuitable for recycling will be disposed of to an approved landfill site./ No burning of rubbish, wood or other materials is allowed on site./ Tipping dockets will be obtained and a register of removed materials maintained.
	Solids and liquids	<ul style="list-style-type: none">/ Disposal of solid and liquid waste will be by an approved contractor to an approved location./ Liquid waste will be stored in impervious bunded containers at a nominated location on site.
	Concrete	<ul style="list-style-type: none">/ A concrete wash out area will be nominated on site./ Concrete washout will be recycled where possible and used on site to stabilise access or for fill material.
	Contaminated	<ul style="list-style-type: none">/ Contaminated materials identified on site will be managed on site and disposed of off-site by a licensed contractor./ Contaminated soil is to be loaded directly into trucks and removed to an approved landfill site./ Contaminated materials will be managed and disposed of by a licensed contractor.
	Stockpiles	<ul style="list-style-type: none">/ Stockpiles will be in areas approved by the Site Manager./ Stockpiles will be managed to prevent pollution.

WASTE MANAGEMENT PLAN



	Sewer	<ul style="list-style-type: none">/ All waste from ablution blocks and lunch sheds will be connected to the main sewer system by a licensed contractor./ All waste from portable ablution blocks will be disposed of by a licensed liquid waste transporter to an approved facility.
WASTE CONTRACTOR/S	During the construction of the project, removal and recycling of waste will be provided by BINGO. Waste removed from site will be transported to an approved waste or recycling facility. All waste removed from site will be tracked through waste documents and/or monthly waste reports provided by the contractor.	
WASTE MATERIAL	Concrete and masonry product	<ul style="list-style-type: none">/ Concrete waste generated during demolition will be recycled/ Concrete wash out will be used for access paths and road where possible. All other concrete waste will be placed in designated skips on site./ Excess concrete will be returned to the supplier./ Masonry recovered during demolition will be recycled where possible by the demolition contractor./ Masonry off cuts from construction may be reused on site for temporary access ways or placed in designated skip bins for recycling.
	General waste	<ul style="list-style-type: none">/ All general waste generated on site including food scraps will be placed in the bins provided in the amenities buildings./ Such waste will be removed from site by an approved contractor.

WASTE MANAGEMENT PLAN



Excavated material	<ul style="list-style-type: none">/ Normal excavation methods will be used by the approved contractor./ Work areas will have identification barriers to prevent unauthorised access. All personnel will be required to follow the safety management plan while conducting excavations works./ Any contaminated soil to be removed will be tested prior to removal directly to waiting trucks. Contaminated material will be transported by the most direct route to an approved treatment/landfill facility./ The transport of all materials from the site will conform to the requirements of the EPA, Local Councils, RTA and other relevant authorities./ Where contaminated material is to be stockpiled the area is to be designated by the approved consultant or site manager. Protective barriers are to be in place to warn and protect workers on site./ Trucks removing material from site will have the loads securely covered to prevent spillage. Drivers are required to ensure that no materials are tracked onto the road. All traffic leaving the site is to use the designated wash down bay to remove mud, dust and other debris./ Materials to be removed from site may include:<ul style="list-style-type: none">- General waste including organic material, concrete and other hard waste- Imported fill material- Topsoil- Landfill waste- General fill- Unsuitable material- Contaminated material
Green waste	<ul style="list-style-type: none">/ Green waste generated as a result of tree felling, mulching or top soil removal will be:/ Removed from site and transported to an accredited waste facility.
Glass, paper, plastic and cardboard	<ul style="list-style-type: none">/ During the construction of the project, such products will be placed in designated bins for recycling.
Plasterboard	<ul style="list-style-type: none">/ During the construction of the project, such products will be placed in designated bins for recycling.
Polystyrene	<ul style="list-style-type: none">/ During the construction of the project, such products will be placed in designated bins for recycling.

WASTE MANAGEMENT PLAN



Steel and
aluminium

- / Where practicable, such products recovered during the demolition process will be recycled. During the construction of the project, such products will be placed in designated bins for recycling.

Timber

- / Timber recovered during the demolition process will be assessed on site by the demolition contractor and recycled where possible
- / Timber will be used and cut in the most economical fashion where ever possible.
- / Timbers for formwork, temporary structures and handrails will be reused and maintained at full lengths wherever possible.
- / Rainforest timbers and Australian high conservation timbers will not be used on this project.

WASTE MANAGEMENT PLAN



WASTE MANAGEMENT TARGETS

The following provides a list of estimated targets for waste products generated on this project, (Based on historical data from previous similar projects)

MATERIAL TYPE	Estimated Volume (CUM)	Estimated % Recycled	Disposal Location
Soil, Sand	15	25%	Just Skip Bins Camelia License Recycling Facility (EPL12700)
Concrete, Brick, Asphalt, Tiles	800	95%	
Recyclable Paper/Cardboard	15	90%	
Recyclable Plasterboard	30	90%	
Recyclable timber and green waste	650	90%	
Metal / Steel	275	95%	Sell and Parker Blacktown Licensed Metal recycling facility (EPL 11555)
General (Residual) Waste	250	0%	Bingo Industries Licensed Facility Eastern Creek
Project targets for Recycled and Non-Recycled waste			
Landfill:		15%	
Recycled Waste		85%	

WASTE MANAGEMENT PLAN



ANNEXURE A - JUST SKIP BINS DISPOSAL FACILITIES



Environment Protection Licence

Licence - 12700

Licence Details	
Number:	12700
Anniversary Date:	02-August

Licensee
KLF HOLDINGS PTY LTD
16 GRAND AVENUE
CAMELLIA NSW 2142

Premises
KLF HOLDINGS PTY LTD
16 GRAND AVENUE
CAMELLIA NSW 2142

Scheduled Activity
Waste processing (non-thermal treatment)
Waste storage

Fee Based Activity	Scale
Non-thermal treatment of general waste	Any annual processing capacity
Waste storage - other types of waste	Any other types of waste stored

Region
Waste & Resource Recovery
59-61 Goulburn Street
SYDNEY NSW 2000
Phone: (02) 9995 5000
Fax: (02) 9995 5999
PO Box A290
SYDNEY SOUTH NSW 1232

Environment Protection Licence

Licence - 12700



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Environment Protection Licence

Licence - 12700



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Environment Protection Licence

Licence - 12700



Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence

Licence - 12700



The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

KLF HOLDINGS PTY LTD
16 GRAND AVENUE
CAMELLIA NSW 2142

subject to the conditions which follow.

Environment Protection Licence

Licence - 12700



1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Waste processing (non-thermal treatment)	Non-thermal treatment of general waste	Any annual processing capacity
Waste storage	Waste storage - other types of waste	Any other types of waste stored

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
KLF HOLDINGS PTY LTD
16 GRAND AVENUE
CAMELLIA
NSW 2142
LOT A DP 109063

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.



Environment Protection Licence

Licence - 12700

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

EPA identi- fication no.	Type of monitoring point	Location description
1	Noise monitoring	Most affected residence

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Waste

L2.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.

Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.

Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.

This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Building and demolition waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste storage Waste processing (non-thermal treatment)	
NA	Virgin excavated natural material	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste storage Waste processing (non-thermal treatment)	
NA	Asphalt waste (including asphalt resulting from road construction and waterproofing works)	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste storage Waste processing (non-thermal treatment)	

Environment Protection Licence

Licence - 12700

NA	Wood waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste storage Waste processing (non-thermal treatment)	
NA	Waste tyres	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste storage	No more than 80 tyres or 400 kilograms of tyres, shredded tyres or tyre pieces may be stored at the premises at any time
NA	Garden waste	As defined in Schedule 1 of the POEO Act, in force from time to time	Waste storage	The amount of Garden Waste stored at the Premises must not exceed 5 Tonnes per annum
NA	Soils	Soil that meet the CT1 thresholds of General Solid Waste in Table 1 of the Waste Classification Guidelines as in force from time to time with the exception of the maximum threshold values for contaminants specified in the 'Other Limits' column	Waste storage Waste processing (non-thermal treatment)	Arsenic 40mg/kg; Cadmium 2mg/kg; Copper 200mg/kg; Mercury 1.5mg/kg; Zinc 600mg/kg; Petroleum Hydrocarbons C6-C9 150mg/kg; Petroleum Hydrocarbons C10-C36 1600mg/kg; Polycyclic aromatic hydrocarbons 80mg/kg; Polychlorinated biphenyls (individual) 1mg/kg. No Acid Sulfate Soil or Potential Acid Sulfate Soil is to be received at the Premises. Soil thresholds will be subject to review from time to time.

L2.2 The height of any stockpile of waste or any processed substance must not exceed four (4) metres.

Environment Protection Licence

Licence - 12700

- L2.3 The licensee must install and maintain a visible permanent stockpile marker that shows the permitted height of stockpiles, being four metres.
- L2.4 The authorised amount of waste permitted on the premises cannot exceed 6,500 tonnes at any one time.

L3 Noise limits

- L3.1 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

POINT 1

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	LAeq (15 minute)	n/a	50
Morning-Shoulder	LAeq (15 minute)	n/a	43
Morning-Shoulder	LAeq(period)	n/a	40
Morning-Shoulder	LAFmax	n/a	53

- L3.2 The location referred to in the table above is the most affected residential dwelling to the premises as stated in "Revised Noise Impact Assessment Report for KLF Holdings Pty Ltd 16 Grand Ave, Camellia" dated 25 August 2015.
- L3.3 For the purpose of condition L3.1;
- Day is defined as the period from 7:00am to 6:00pm Monday to Friday, and 7:00am to 4:00pm Saturday.
 - Morning shoulder is defined as the period from 5:00am to 7:00am Monday to Friday, and 6:00am to 7:00am Saturday.
 - LAFmax is for a period of 15 minutes.
- L3.4 The noise limits set out in condition L3.1 apply under all meteorological conditions except for the following:
- a) Wind speeds greater than 3 meters/second at 10 metres above ground level; or
 - b) Stability category F temperature inversion conditions and wind speeds greater than 2 meters/second at 10 metres above ground level; or
 - c) Stability category G temperature inversion conditions.
- L3.5 For the purposes of condition L3.4, temperature inversion conditions (stability category) must be

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determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L3.6 To determine compliance:

a) with the Leq(15mins) and Leq noise limits in L3.1, the noise measurement equipment must be located:

- approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
- within 30 metres of a dwelling façade, but not closer than 3 metres, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
- within approximately 50 metres of the boundary of a National park or a Nature Reserve.

b) with the LA1(1 minute) noise limits in condition L3.1, the noise measurement equipment must be located within 1 meter of a dwelling façade.

c) with the noise limits in condition L3.1, the noise measurement equipment must be located:

- at the most affected point at a location where there is no dwelling at the location; or
- at the most affected point within an area at a location prescribed by conditions L3.6(a) or L3.6(b)

L3.7 A non-compliance of condition L3.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at a location other than an area prescribed by conditions L3.6(a) and L3.6(b); and/or
- at a point other than the most affected point at a location.

L3.8 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

Note: Definitions

NSW Industrial Noise Policy - the document entitled "New South Wales Industrial Noise Policy" published by the Environment Protection Authority in January 2000.

Noise – "sound pressure levels" for the purposes of conditions L3.1 to L3.8.

L4 Hours of operation

L4.1 The hours of operation of the use of the premises is restricted to:

5:00am to 6:00pm - Monday to Friday

6:00am to 4:00pm - Saturday

At no time on Sunday or Public Holidays

Sorting or processing of materials is prohibited between:

5:00am to 7:00am - Monday to Friday

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6:00am to 7:00am - Saturday

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:

- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:

- a) must be maintained in a proper and efficient condition; and
- b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 Activities must be carried out in a manner that minimises the generation of dust.

O3.2 The premises must be maintained in a condition which prevents the emission of dust from the premises.

O3.3 The licensee must ensure that no material, including sediment or oil, is tracked from the premises.

O3.4 Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.

O4 Emergency response

O4.1 The licensee must maintain and implement as necessary a current emergency response plan for the premises. The licensee must keep the emergency response plan on the premises at all times. The emergency response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosion or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. If a current emergency response plan does not exist at the date on which this condition is attached to the licence, the licensee must develop an emergency response plan within three months of that date.

O4.2 The licensee must prepare, maintain and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises.

NOTE: The licensee must develop their PIRMP in accordance with the requirements in Part 5.7A of the

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Protection of the Environment Operations Act 1997 (the POEO Act) and the POEO Regulations.

O5 Waste management

O5.1 All Garden Waste received at the premises must be stored in a sealed bin.

O6 Other operating conditions

O6.1 On Monday to Friday between the hours of 5:00am and 7:00am a maximum of 14 truck movements (or 7 per hour) are permitted to deposit waste to the premises.

On Saturday between the hours of 6:00am and 7:00am a maximum of 7 truck movements are permitted to deposit waste to the premises.

O6.2 Between the hours of 5:00am and 7:00am on Monday to Friday the use of excavators, loaders, screeners or other machinery at the premises is prohibited.

Between the hours of 6:00am and 7:00am on Saturday the use of excavators, loaders, screeners or other machinery at the premises is prohibited.

5 Monitoring and Recording Conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:

- a) in a legible form, or in a form that can readily be reduced to a legible form;
- b) kept for at least 4 years after the monitoring or event to which they relate took place; and
- c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:

- a) the date(s) on which the sample was taken;
- b) the time(s) at which the sample was collected;
- c) the point at which the sample was taken; and
- d) the name of the person who collected the sample.

M2 Recording of pollution complaints

M2.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M2.2 The record must include details of the following:

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- a) the date and time of the complaint;
- b) the method by which the complaint was made;
- c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- d) the nature of the complaint;
- e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the licensee, the reasons why no action was taken.

M2.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M2.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M3 Telephone complaints line

- M3.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.
- M3.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.
- M3.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M4 Other monitoring and recording conditions

- M4.1 The licensee must keep a record of each load of Soil, as referred to under Condition L2.1, that is received at the premises. The record must include, but not necessarily be limited to, the following:
 - a) a copy of the waste classification report in accordance with the Waste Classification Guidelines, including the classification and the limits specified in the L2.1 table;
 - b) the quantity (in tonnes) of the Soil received;
 - c) the date and time that the Soil were received;
 - d) the registration number of the vehicle transporting the Soil to the premises;
 - e) the name and contact details of the company or individual delivering the Soil to the premises;
 - f) the source(s) and address from where the Soil were received;

The record must be retained at the premises for at least 4 years after the receipt of the load of the soil. The record must be produced to any authorised officer of the EPA upon request.

6 Reporting Conditions

R1 Annual return documents

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R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

R1.3 Where this licence is transferred from the licensee to a new licensee:

- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
- b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
- b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

- a) the licence holder; or
- b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

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R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R3 Written report

- R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
- a) where this licence applies to premises, an event has occurred at the premises; or
 - b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.
- R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.
- R3.3 The request may require a report which includes any or all of the following information:
- a) the cause, time and duration of the event;
 - b) the type, volume and concentration of every pollutant discharged as a result of the event;
 - c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
 - d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
 - e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
 - f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
 - g) any other relevant matters.
- R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

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G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

G2 Other general conditions

G2.1 Completed Programs

Program	Description	Completed Date
Provide report to calculate the capacity required	provide report to calculate the capacity required to ensure that all rainfall on the premises during a one-in-ten year rainfall event. . Improved environmental management of the site.(*)	17-September-2007
Install a permanent stockpile marker that shows th	install a permanent stockpile marker that shows the permitted height of stockpiles, being four metres.	17-December-2015
Install and/or upgrade the plant used to remove du	install and/or upgrade the plant used to remove dust and dirt from vehicles.	30-September-2007
Install and upgrade plant used to remove dust an	Install and upgrade plant used to remove dust and dirt from truck.. Improved environmental performance of the site.(*)	30-September-2007
Install sprinkler system on processing machinery	fixed sprinkler system to be installed on tromelling machine to minimise dust emissions during processing	25-July-2012
Upgrade dust suppression sprinkler system	fixed sprinkler system to be updated to automatically wet down all areas of internal roadways	25-July-2012

8 Pollution Studies and Reduction Programs

U1 Dust Management Plan

U1.1

By 14 **October 2016** the Licensee must submit to the EPA a comprehensive Dust Management Plan for the Premises. The plan must be prepared by an independent and suitably qualified person.

The Dust Management Plan must:

- Identify all potential dust sources at the Premises and activities which may generate dust.
- Assess the impact of dust from the Premises on neighbouring sensitive receivers.
- Identify weather conditions in which activities which should be reduced or ceased due to the likelihood of dust generation, including methods for identifying such conditions.
- Propose measures to manage dust from all sources. Control measures should focus on (but not be limited to) managing dust from;
 - internal roads;

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- ii. unloading of waste;
 - iii. loading and operation of waste processing equipment and plant; and
 - iv. stockpiles.
- e) Provide a timetable for the implementation of proposed mitigation measures.

U1.2 Proposed dust management measures must be approved in writing by the EPA.

U1.3 Following approval by the EPA, the Licensee must implement and maintain all mitigation measures as proposed in the Dust Management Plan. Proposed mitigation measures as set out in the Dust Management Plan will be included as conditions on the Licence.
Within one month of completion, the Licensee must prepare a response to the EPA documenting the completion/installation of all proposed mitigation measures.

U2 WATER MANAGEMENT STUDIES TOPOGRAPHIC SURVEY

- U2.1 The Licensee must engage a suitably qualified and registered surveyor to complete a topographical survey of the Premises. The survey must be provided to the EPA by no later than **24 August 2018**.
- U2.2 Survey results must be presented in the form of a topographical plan.
- U2.3 The survey plan must show survey results to a minimum of 10 metres beyond the licenced boundary of the Premises. If access to neighbouring properties is not possible, the survey must be completed using aerial survey technology (i.e. unmanned aerial vehicles / drones).
- U2.4 Terrain levels must be represented on the survey plan by contours at not more than 0.2 metre levels.
- U2.5 All levels must be related to the Australian Height Datum and the origin levels noted on the survey plan.
- U2.6 Boundaries of the Premises, date of survey, adjoining title information, scale bar, buildings, roads, fences, stockpiles, pits or depressions and type of ground surface (e.g. concrete, soil etc.) must be noted on the survey plan.
- U2.7 The Licensee must engage a suitably qualified and registered surveyor to undertake a review of historical survey data to identify changes in landform on the Premises. As minimum the review must include:
- 1. a survey conducted as close as possible to the date of issue of the licence being 2 August 2007;
 - 2. the survey required by condition U2.1 of this Licence;
 - 3. at least one survey in between;
 - 4. identification of any changes in ground level; and
 - 5. changes in landform and site boundaries must be presented graphically.

The review of historical survey data must be submitted to the EPA by no later than **24 August 2018**.

REVIEW OF POTABLE WATER USAGE

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U2.8 By no later than **24 August 2018** the Licensee must submit to the EPA a review of potable water usage at the Premises.

U2.9 The Licensee must engage a suitably qualified professional to provide a comparison of:

1. potable water usage at the Premises for a minimum period of six months prior to the installation of the dust suppression system;
2. potable water usage at the Premises for the period 1 August 2017 to 30 April 2018; and
3. water pumping rates for dust suppression sprinklers used on the Premises between 1 August 2017 to 30 April 2018.

WATER FLOW MAP

U2.10 The Licensee must engage a suitably qualified professional, such as a hydrological engineer, with water flow mapping experience to investigate water flows on the Premises and prepare a water flow map for the Premises as a result of the investigation.

U2.11 The water flow map must be informed by the Topographic Survey required in U2.1.

U2.12 As a minimum the water flow map must identify:

1. sealed and unsealed surfaces;
2. potable water piping connections and infrastructure;
3. overland flow directions and paths;
4. formal and informal drainage channels;
5. roof water drainage including gutters and down pipes;
6. below ground water piping, pits and other infrastructure;
7. clean and/or contaminated water storages (such as above or below ground tanks, stormwater detention basins etc.) and associated overflow structures;
8. the location of any water quality treatment devices;
9. location of dust suppression sprinklers, misters, cannons, hoses etc;
10. the location and spread of any diffuse discharges from the Premises;
11. the location of any point discharges from the Premises; and
12. where any water is discharging to.

U2.13 All features and infrastructure must be accurately mapped and GPS referenced.

U2.14 Mapping of below ground water piping, pits and other infrastructure must be undertaken using a GPS referenced video camera. Camera footage must be provided with the water flow map.

U2.15 The water flow map must be submitted to the EPA by no later than **21 September 2018**.

WATER BALANCE

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U2.16 The Licensee must engage a suitably qualified professional, such as a hydrological engineer, to prepare a water balance to estimate the frequency and volume of discharges from the Premises.

U2.17 The water balance must:

1. use daily time-step modelling (based on a suitable climate dataset and representing the range of weather conditions at the Premises);
2. provide the design storm of the stormwater management system;
3. provide justification for key model assumptions (e.g. run-off coefficients, water reuse rates or protocols for dewatering and restoring capacity of the stormwater storages); and
4. identify and where possible address significant model limitations.

U2.18 The water balance must be submitted to the EPA by no later than **14 September 2018**.

WATER CHARACTERISATION

U2.19 The Licensee must engage a suitably qualified professional, with water sampling and characterisation experience, who is a member of the *Australian Contaminated Land Consultants Association* or is certified under the *Certified Environmental Practitioner Scheme* of the Environment Institute of Australia and New Zealand Inc, to characterise the quality of water collected on and discharged from the Premises.

U2.20 A water sampling plan for the characterisation must be submitted to the EPA by no later than **7 September 2018**.

U2.21 The water sampling plan must propose:

1. sampling location(s), including all water storages and discharge points;
2. the pollutants to be sampled, including all those potentially present at levels that pose a risk of non-trivial harm to human health or the environment ('pollutants of concern') (this must be informed by a risk assessment of the types of materials stored and processed on the Premises);
3. the number of sampling events / sampling frequency (a sufficient number of events must be sampled to capture the full range of operational conditions and water quality, including average or typical through to worst case scenarios).

Note: Sampling and analysis must be consistent with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (2004).

U2.22 The water sampling plan must be agreed to in writing by the EPA prior to commencement of sampling.

U2.23 The water characterisation must:

1. compare results to the relevant ANZECC (2000) Guidelines for Fresh and Marine Water Quality trigger values; and

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2. specify the analytical limits of reporting used for any data that is being assessed:

- a. compare that limit of reporting to the relevant ANZECC (2000) assessment criteria; and
- b. where the limit of reporting does not provide a suitable basis for assessing risk of water pollution, propose alternative options to characterise the risk, including more sensitive laboratory testing or risk mitigation options (The level of reporting should be sensitive enough to detect pollutants at levels related to their environmental risk and ANZECC (2000) toxicant trigger value (where available) while having regard to the best available analytical practical quantification limits using available technology.

Note: The licensee may consider alkalinity, hardness and pH as factors that could potentially modify the toxicity and bioavailability of any relevant metals.

U2.24 The water characterisation, must be submitted to the EPA within **one month of the final sampling event**.

9 Special Conditions

E1 Financial assurance

- E1.1 A financial assurance in the form of an unconditional and irrevocable guarantee from a bank, building society or credit union in favour of the EPA in the amount of sixty five thousand dollars (\$65 000) must be provided to the EPA by 30 September 2007. The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.
- E1.2 A financial assurance in the form of an unconditional and irrevocable guarantee from a bank, building society or credit union in favour of the EPA in the amount of sixty five thousand dollars (\$130 000) must be provided to the EPA by 31 July 2008. The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.
- E1.3 A financial assurance in the form of an unconditional and irrevocable guarantee from a bank, building society or credit union in favour of the EPA in the amount of two hundred and twenty thousand dollars (\$220 000) must be provided to the EPA by 31 July 2009. The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence. The financial assurance must contain a term that provides that any monies claimed can be paid to the EPA or, at the written direction of the EPA, to any other person. (received)
- E1.4 The financial assurance must be maintained during the operation of the facility and thereafter until such time as the EPA is satisfied the premises is environmentally secure.
- E1.5 The financial assurance must be replenished by the full amount claimed or realised if the EPA has claimed on or realised the financial assurance or any part of it to undertake a work or program required to be carried out by the licence which has not been undertaken by the licence holder.
- E1.6 The EPA may increase the amount of the financial assurance at any time as a result of reassessment of

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the total likely costs and expenses of rehabilitation of the premises.

E1.7 The licensee must provide to the EPA the original counterpart guarantee within five working days of the issue of:

a) the adjusted financial assurance as required by condition E1.6.

E2 Environmental Obligations of Licensee

E2.1 While the licensee's premises are being used for the purpose to which the licence relates, the licensee must:

a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.

b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given by the EPA.

c) Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.

E2.2 In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee (whether or not the premises continue to be used for the purposes to which the licence relates) must:

a) Make all efforts to contain all firewater on the licensee's premises;

b) Make all efforts to control air pollution from the licensee's premises;

c) Make all efforts to contain any discharge, spill or run-off from the licensee's premises;

d) Make all efforts to prevent flood water entering the licensee's premises;

e) Remediate and rehabilitate any exposed areas of soil and/or waste;

f) Lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of;

g) At the request of the EPA monitor groundwater beneath the licensee's premises and its potential to migrate from the licensee's premises;

h) At the request of the EPA monitor surface water leaving the licensee's premises and

i) Ensure the licensee's premises is secure.

E2.3 After the licensee's premises cease to be used for the purpose to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:

a) remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises;

b) rehabilitate the site, including conducting an assessment of and, if required, remediation of any site contamination.

E3 EPA may claim on Financial Assurance

E3.1 The EPA may claim on a financial assurance under s303 of the POEO Act if a licensee fails to carry out

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any work or program required to comply with the conditions of this licence or clean up notice issued under section 91 of the Protection of the Environment Operations Act 1997.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .

Environment Protection Licence

Licence - 12700



TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Mr Chris McElwain

Environment Protection Authority

(By Delegation)

Date of this edition: 02-August-2007

Environment Protection Licence

Licence - 12700

End Notes

- 1 Licence varied by notice 1079460, issued on 06-Nov-2007, which came into effect on 06-Nov-2007.
- 2 Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
- 3 Licence varied by notice 1101272, issued on 04-Jun-2009, which came into effect on 04-Jun-2009.
- 4 Licence varied by Correction to EPA Region data record., issued on 23-Jun-2010, which came into effect on 23-Jun-2010.
- 5 Licence varied by notice 1118346, issued on 15-Sep-2010, which came into effect on 15-Sep-2010.
- 6 Licence varied by notice 1120031, issued on 07-Oct-2010, which came into effect on 07-Oct-2010.
- 7 Licence varied by notice 1504863 issued on 26-Apr-2012
- 8 Licence varied by notice 1506267 issued on 05-Oct-2012
- 9 Licence varied by notice 1532402 issued on 23-Sep-2015
- 10 Licence varied by notice 1535958 issued on 17-Dec-2015
- 11 Licence varied by notice 1542563 issued on 24-Aug-2016
- 12 Licence varied by notice 1545299 issued on 27-Sep-2016
- 13 Licence varied by notice 1564953 issued on 30-Jul-2018



ENVIRONMENT AND PLANNING

CONSTRUCTION AND DEMOLITION WASTE REPORTING CRITERIA

Compliance verification certificate for:
'Waste Contractor' and 'Waste Processing'

Just Skip Bins Pty Ltd
ABN: 34 623 417 676

Overall Findings:

Waste Contractor (Part I and II): Compliant
Waste Processor (Criteria I, II and III): Compliant

AUDITOR | ERIK LARSON

SIGNATURE |

A handwritten signature in black ink, appearing to be "Erik Larson", written over a horizontal line.

DATE | 30 SEPTEMBER 2021

VALID TO | 29 SEPTEMBER 2022



CONSTRUCTION AND DEMOLITION WASTE REPORTING CRITERIA

Compliance verification certificate for:
'Waste Processing'

KLf Holdings Pty Ltd (Camellia) (ABN 25 119 648 234)

Overall Findings:

Waste Processor (Criteria I, II and III): Compliant

AUDITOR | ERIK LARSON

SIGNATURE |

A handwritten signature in black ink, appearing to be "Erik Larson", written over a dashed line.

DATE | 30 SEPTEMBER 2021

VALID TO | 29 SEPTEMBER 2022

WASTE MANAGEMENT PLAN



ANNEXURE B – ADCO ASBESTOS MANAGEMENT PROCEDURE

Contamination & Hazardous Building Materials Management Sub Plan

1. SCOPE OF PROJECT AND SUB PLAN

Project Details	
Scope of the Sub Plan	<p>This Contamination & Hazardous Building Material Management Sub Plan provides details of the controls that will be implemented to identify and manage contaminated soil and water and Hazardous Building Materials where it is known to exist on a site and/or where it is found unexpectedly during the site establishment or construction, fit out and commissioning of the Institute of Applied Technology for Construction Project, located at 12-44 O'Connell St, Kingswood.</p> <p>The Sub Plan forms part of the ADCO Construction Environmental Management system. Environmental Management at this workplace is documented in the Project Environmental Management Plan, Environmental Risk Register and related Sub Plans, which together hold certification to Australian and international standards and accreditation with Federal and State authorities.</p>
Objectives of the Sub Plan	<ul style="list-style-type: none"> • To prevent erosion and sedimentation and establish controls for surface stormwater. • To prevent pollution of stormwater drains and waterways. • To minimise disturbance to local hydrological regimes. • To ensure dewatering activities meet authority requirements and minimise impacts on adjacent water bodies. • To ensure stormwater, erosion and sedimentation controls are effective and maintained at all times.
Scope of Works	<p>This Sub Plan has been prepared based on consideration of the following scope of works:</p> <ul style="list-style-type: none"> • Site establishment including vegetation removal, topsoil stripping, office and compound setup including waste management, material handling and storage areas. The Site Establishment Office and Amenities will utilise the existing infrastructure/ buildings on site. Amenities and additional First Aid Shed and Change room will be established alongside the amenities as detailed in the site control plan once further amenities is required. • Excavation of ground materials. The Project does not have any import or export of bulk fill. • Piling. There are 234 Bored Piers ranging roughly 8m in depth. • Construction of the building. The construction is a combination of Formed insitu concrete and Structural steel which encases the 3 story building. Due to the location of the building the Authority services will be brought in from O'Connell street. • Fit out and commissioning. The internal fit out is has high end finishes open workshops some bespoke joinery. The area has a loading dock and carparking facilities to accommodate some of the new personnel attending the building while also utilising the existing carpark.

Contamination & Hazardous Building Materials Management Sub Plan

	Internally the area is air-conditioned and has ICT functionality which will be leading the way for teaching in the coming years. There are public amenities, disabled and ambulant toilets.
Key Issues and Risks	<p>The field work investigations and soil sampling soils classifications concluded by EIS are:</p> <ul style="list-style-type: none"> ● Fill: Based on the results of the assessment, the fill material is classified as General Solid Waste (non-putrescible). ● Natural Soil: Based on the scope of work undertaken for this screening, and at the time of reporting, EIS are of the opinion that the natural soil at the site meets the definition of VENM for off-site disposal or re-use purposes. ● Acid Sulfate Soil: Considering the information reviewed for this assessment (risk maps, subsurface conditions etc.), PASS or ASS conditions are not considered to be present in the soils above the shallow bedrock. ● Volatile Organic Compounds (VOCs) Screening: All results were 0ppm equivalent isobutylene which indicates a lack of PID detectable VOCs. <p>The extent of potential and known contamination and any Hazardous Building Materials has been assessed as low.</p> <p>However there is still potential of contamination of the soil in the form of Asbestos material associated with the services to the old existing building on the site. This would most probably very localised and manageable. There is also the potential discovery of hazardous building materials hidden in the old buildings on the site that need some fitout work as part of the scope of works.</p> <p>The presence and subsequent disturbance of contaminated soil / groundwater creates the potential for environmental and health impacts including off-site pollution, if appropriate controls are not identified, implemented and maintained on the site.</p> <p>The following activities are expected to be the key risk sources associated with the handling of contaminated and hazardous building materials during construction:</p> <ul style="list-style-type: none"> ● Exposure of workers or the community to fibre and/or vapours or chemicals in soil and groundwater during detailed and bulk excavation and fitout works. ● Incorrect storage of contaminated soil or groundwater resulting in the on- or off-site migration of contaminants into local ecosystems; ● Inadvertent creation of a migration pathway linking the contamination to a sensitive receptor (e.g. service trench); ● Inappropriate re-use or disposal of contaminated materials without approval or required documentation.

Contamination & Hazardous Building Materials Management Sub Plan

Legislation, Approval and Guidelines	<p>State/ Regional: Protection of the Environment Operations Act 1997 Protection of the Environment Operations (Waste) Regulation 2014 Waste Avoidance and Resource Recovery Act 2001 NSW Contaminated Land Management Act 1997 National Environmental Protection (Assessment of Site Contamination) Measure NEPM (1999) AS4482.1:2005 Guide to the Sampling and Investigation of Sites with Potentially Contaminated Soil – Non-volatile and Semi-volatile compounds. Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000</p>
Summary of Site Controls	<p>Works must be planned, implemented and monitored in accordance with the ADCO Environmental Management Plan and this Sub Plan. These documents detail ADCO's approach and commitment to pro-active and responsible site management.</p> <p>Site specific controls, monitoring, reporting and performance measures have been identified in this Sub Plan to manage contamination. These include but are not limited to:</p> <ul style="list-style-type: none"> • Appointing a suitably qualified consultant to conduct a contamination assessment (if necessary) • Appointing a suitably qualified consultant to conduct a Hazardous Building Material Survey of the existing structures to identify suspect materials (if necessary) • Obtaining a preliminary waste classification report for spoil proposed to be removed from site. • Assessing remediation and reuse options; • Making provision for the segregation of soils and temporary stockpiling; • Classifying soil and waste prior to removal off site; • Minimising the exposure of workers and the community to contamination; and • Validating the site after the removal of contaminated material. <p>A Contaminated & Hazardous Building Materials Environmental Control Map will be prepared for the site. This Environmental Control Map (ECM) will be attached to this Sub Plan.</p> <p>Requirements for contamination identification, management and disposal will be included in relevant specifications, contract agreements, subcontractor work method statements and quality assurance processes.</p> <p>Site inspections and surveillance will be undertaken by ADCO's or its representatives and subcontractors as detailed in the following table.</p>

Contamination & Hazardous Building Materials Management Sub Plan

Unexpected Find Protocol	<p>If suspected contaminated soil, water or Hazardous Building Materials are discovered during site establishment, excavation or construction works in an area previously identified as being uncontaminated (clean), the following protocol must be followed:</p> <ol style="list-style-type: none">1. Cease work and evacuate the area immediately (to the upwind side of the contamination);2. Contact the Project Manager or Site Manager immediately to report the issue;3. Erect barricades to isolate the area. Where possible a minimum distance of 10m should be established between the suspect material and the barrier.4. PM will notify the appropriate regulatory authority as soon as possible (where applicable).5. Engage a suitably qualified environmental specialist.6. Prevent access to the barricaded area. A Clearance Certificate or written approval from the environmental specialist must be obtained prior to re-gaining entry to the area.7. Arrange sampling of the suspect material by the environmental specialist (as advised by Project Manager).8. In consultation with the environmental specialist, ADCO senior site personnel and/or relevant authorities, determine if further remedial action is necessary based on the sample results to enable reuse, treatment or disposal.9. Obtain permits to carry out remedial works and implement appropriate environmental and health controls. Obtain a written clearance certificate from the environmental specialist before re-entering the area. <p>Remove the barricade at the completion of the remedial works and resume activities under the direction of the ADCO Project Manager.</p>
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Contamination & Hazardous Building Materials Management Sub Plan

2. IMPLEMENTATION OF THE SUB PLAN

Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
Planning and Site Establishment					
Prepare a preliminary contamination assessment for the site OR obtain a copy of existing (relevant) contamination reports and determine the current site conditions.	Prior to works commencing	Obtain and review the contamination assessment and use it to assess potential risks, inform the construction program and identify acceptable work methods. Include relevant requirements into subcontractor WMSs and contract documentation.	Project Manager PM Site Manager SM	SWMSs prepared. Requirements incorporated into subcontract documentation.	No inappropriate disposal of contaminated materials. No adverse impact on the health of workers or the community.
Obtain a preliminary waste classification report or Hazardous Building Survey to facilitate the identification of materials.	Prior to works commencing	Arrange for the testing and classification of spoil/ groundwater. Arrange for Hazardous Building Survey. Identify waste types, volumes and landfill facilities approved for disposal.	PM/SM	Waste classification details available. Reuse options identified. Suitable disposal sites identified.	Waste disposed of in accordance with the waste classification report.
Prepare a Contaminated & Hazardous Building Materials ECM showing the location of known locations, and sensitive receptors.	Prior to works commencing	Review Environmental Control Map (ECM Appendix 1).	PM/SM	Map prepared prior to works commencing.	Storage areas located away from sensitive receivers. No spills or incidents.

Contamination & Hazardous Building Materials Management Sub Plan

Include information in the Site Induction about the risks and impacts of unexpected contamination.	Prior to works commencing	Site induction package to include site specific information. Deliver induction material.	PM/SM	SWMSs prepared by subcontractors address contaminated material identification, storage, handling and disposal.	Site induction delivered to all workers on site.
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Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
Planning and Site Establishment (cont.)					
Implement the Unexpected Find Protocol if contaminated or hazardous building material is exposed or suspected.	As required during early works	Implement protocol immediately.	CM/SM	As per the protocol. Report to RBU EHS Manager.	Protocol followed. Minimal disturbance to suspected contaminated material. No impact on the environment or workers due to exposure.
If contaminated material is encountered identify and establish suitably sized stockpile areas in appropriate locations within the site.	Prior to works commencing	Make provision for the on-site temporary storage of soil pending waste classification or advice from the Client. Contractor to prepare area based on specification (must be sealed, bunded and drained appropriately). Segregate soils pending re-use, remediation and/or off-site disposal.	SM	Daily surveillance to assess stockpile conditions. Weekly inspection checklist.	No uncontrolled or off-site pollution associated with material storage.

Contamination & Hazardous Building Materials Management Sub Plan

If contaminated material or hazardous material is encountered obtain relevant approvals and permits for remediation and transport, reuse and/or disposal of contaminated soil and/or water.	Prior to any material leaving site	<p>Identify suitable waste transport contractors.</p> <p>Obtain details of contractor licences and approvals to transport contaminated or hazardous materials.</p> <p>Check landfill/disposal facility licence details to confirm their suitability to accept the material.</p>	SM	<p>Copies of licences and approvals reviewed.</p> <p>Disposal/weighbridge documents retained</p>	<p>No waste leaving site without approval.</p> <p>Copies of permits/approvals kept on site.</p>
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Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
Remediation, Reuse, Validation and Disposal					
Treatment of contaminated soil and groundwater on site for reuse or to achieve a lower waste classification	Where feasible	<p>Seek advice from the environmental consultant on treatment, remediation and reuse options.</p> <p>Obtain relevant approvals.</p> <p>Arrange for validation of treated materials to confirm fit for purpose/reuse.</p>	PM Specialist consultant ADCO HSE Manager	<p>Approvals received.</p> <p>Remediation test reports obtained.</p> <p>Validation of remediated soils and water.</p>	<p>No environmental incidents during treatment.</p> <p>No complaints regarding odour during treatment.</p> <p>No soil/water reused without consent.</p> <p>Reuse achieved.</p>
Review the safety and environmental risks involved in the transport of contaminated soil/water to receiving facilities.	Prior to material being removed from site	<p>Contractor to provide details on transport route.</p> <p>Assess route and risks.</p> <p>Drivers to be advised and instructed in safe transport and agreed route.</p> <p>Licensed contractors only used.</p>	SM	<p>Inspect contractor licences, approvals, insurance and vehicle condition.</p>	<p>Copies of relevant documents retained in site files.</p> <p>No use of unauthorised traffic routes.</p> <p>No transport incidents or loss of materials onto public roads.</p>

Contamination & Hazardous Building Materials Management Sub Plan

Dispose of contaminated soils and water or Hazardous Building material that cannot be reused or recycled to an appropriately licensed landfill or facility.	Where remediation and on-site reuse is not feasible	<p>Contractor to prepare and communicate requirements of a SWMS addressing the handling, transport and disposal of contaminated materials.</p> <p>Contractor to obtain disposal approvals, permits and licence details.</p> <p>Contractor to retain waste disposal documentation.</p>	SM Contractor	<p>Inspect permits, approvals and transport vehicles.</p> <p>Obtain copies of waste report/dockets to verify disposal to an approved facility.</p>	<p>No loss of material onto public roads.</p> <p>No illegal disposal of waste.</p> <p>Waste dockets correspond with expected waste volumes/types.</p>
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Control Measure	Timing	Methodology	Responsibility	Monitoring and Reporting	Performance Measurement
Decontamination					
If contaminated material or hazardous material is encountered establish worker decontamination areas.	Prior to and during remediation and removal activities	<p>Seek specialist advice from an OHS hygienist.</p> <p>Contractor to prepare a SWMS and instruct workers.</p> <p>Establish suitable facilities for worker decontamination, the removal of coveralls and the cleaning of masks and boots. Respirators must remain on during the decontamination process.</p> <p>Dispose of used clothing and equipment as contaminated waste.</p>	SM Contractor	<p>Daily surveillance of decontamination operation.</p> <p>Personal monitoring or testing (as recommended by the specialist hygienist).</p> <p>Waste dockets/reports obtained.</p> <p>Inspection by specialist.</p>	<p>Monitoring implemented and results available and assessed.</p> <p>No exceedance of monitoring criteria.</p> <p>Correct waste disposal.</p>

Contamination & Hazardous Building Materials Management Sub Plan

If contaminated material or hazardous material is encountered establish plant decontamination areas.	Prior to and during remediation activities	<p>Seek specialist advice from an OHS hygienist on the set-up of wash out/decontamination areas.</p> <p>Contractor to prepare a SWMS and instruct workers.</p> <p>Identify designated parking areas within the contaminated zone for the washdown of excavators/trucks, plant and tools.</p> <p>Contractor to provide suitable PPE for activity.</p> <p>Provide environmental controls to capture wash-water and transfer to a truck outside the contaminated zone.</p> <p>Arrange for testing and classification of the waste prior to disposal.</p>	SM	<p>Daily surveillance.</p> <p>Weekly inspection checklist.</p> <p>Inspection by specialist.</p> <p>Waste dockets/reports.</p>	<p>No uncontrolled discharge of wash water.</p> <p>No waste to leave site until classified.</p>
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3. APPENDIX 1 – CONTAMINATION & HAZARDOUS BUILDING MATERIALS ENVIRONMENTAL CONTROL MAP

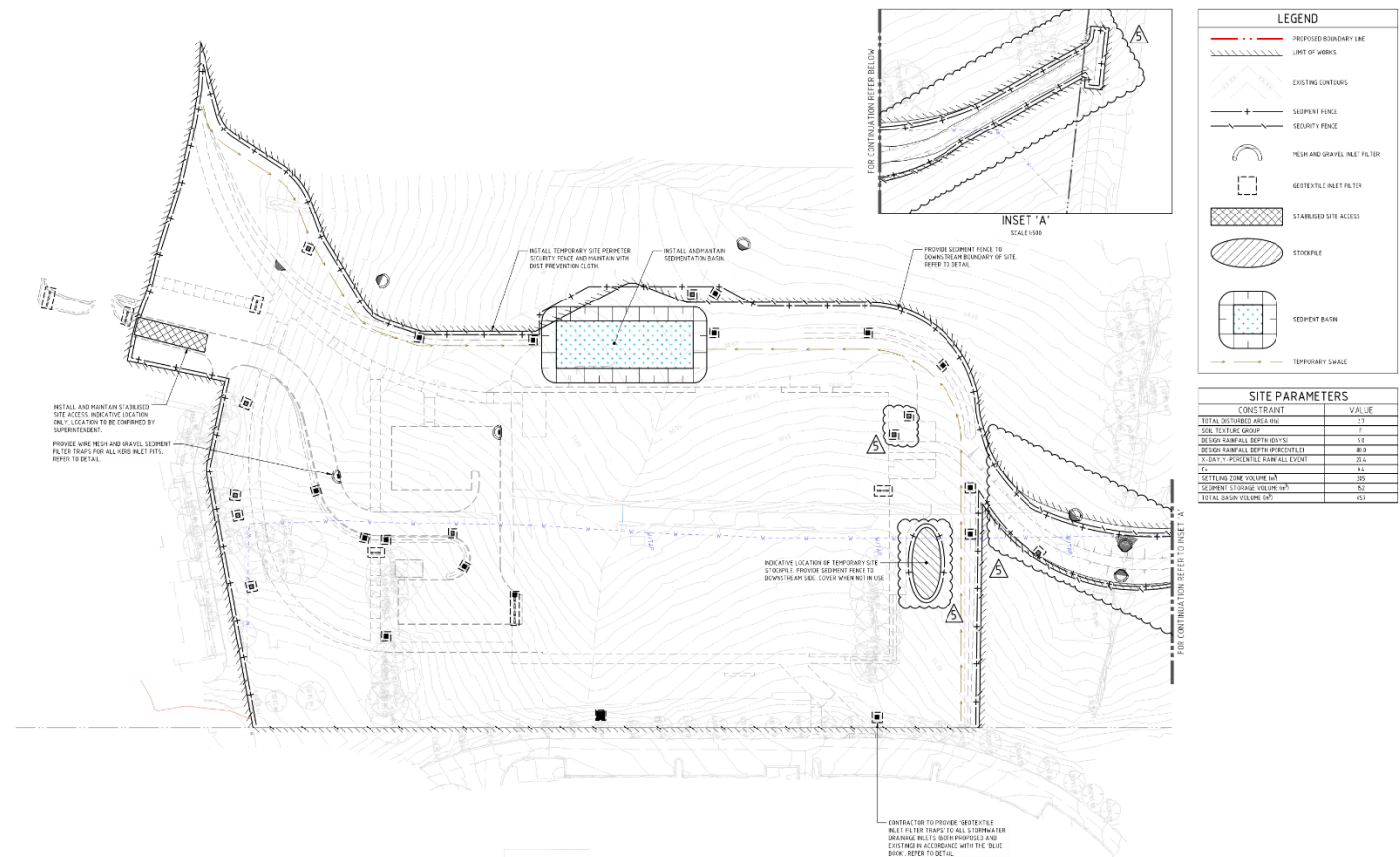
- INSERT MAP AND LABEL THE ITEMS BELOW

Contaminated & Hazardous Building Material Management Environmental Control Map showing:

- Known contaminated areas/hot spots/groundwater depths.

Contamination & Hazardous Building Materials Management Sub Plan

- Adjoining properties (sensitive receivers)
- Stockpile and water storage areas
- Decontamination areas for workers and plant.
- Other key features of the site and surrounds



Contaminants Management

DESCRIPTION

Environmental contamination: The introduction into water, air and/or soil of microorganisms, chemicals, toxic substances, wastes or waste water in a concentration that makes the medium (water, air and/or soil) unfit for its next intended use (consumption, crop production, habitation).

PROJECT PLANNING

On a project site, where there is a possibility of water or ground pollution as a result of contaminants within the project site, information must be included in the [Project Risk Register \(Environmental\)](#). Project Risk Register information includes, but is not limited to:

- Details of contaminants which may result in an environmental impact.
- Details of work activities with contaminants which may have an environmental impact, locally or on the eco-system.
- Details of the potential risks of the work activities and required control measures. (This is commonly known as "Aspects and Impacts").
- Details of any management requirements noted in supporting documentation or consents (e.g. DA conditions, legislative requirements).

COMMON CONTAMINANTS

ASBESTOS

Asbestos is a term for a group of naturally occurring mineral fibres which were incorporated into building products due to their flexibility, tensile strength, insulation from heat and electricity, chemical inertness and affordability.

Both friable and non-friable asbestos pose significant health risks to humans if the materials are not properly maintained or removed.

Refer to [Procedure: Asbestos Management](#) for information on the identification and management of asbestos in the workplace.

- For unexpected finds (e.g. asbestos which is located in a building / in the ground and which was not listed in an Asbestos Register or Geotech Report), refer to the Unexpected Finds General Requirements information sheet. Specify / use materials in standard sizes. (Reduce off-cuts).



LEAD

Lead is a heavy metal that is toxic to the human body when inhaled, eaten or absorbed.

Lead contamination affects biological systems by affecting ecosystem productivity (inhibiting plant growth) and nutrient.

Lead was used as a base, drying agent, colouring and to protect steel and iron from rust and was found in domestic paint up to 1970 and commercial surface treatments up to 2010.

Lead contamination can be airborne (e.g. dust from sanding, blasting), in ground (soil from lead products or commercial activities) or in water (e.g. leaching from premises).

Site Management:

- ▽ Arrange for testing to be completed.

Small areas / test samples: can be done on site with a DIY test kit available from hardware and paint stores. These sample kits should give an indication which provides an indication of the presence of lead.

Large areas / metals etc.: to be completed by a competent person (e.g. Environmental Engineer, Hygienist) to determine the presence / level of lead in the product, soil, water.

- ▽ Arrange for development of / or develop a Lead Management Plan (LMP). As required (lead risk work), arrange for review of the LMP by a competent person.

- ▽ Incorporate the requirements of the LMP into the Project Risk Register.

Ensure that the LMP is provided to subcontractors completing the work for development of / inclusion in their SWMS.

- ▽ Where required: For lead risk work, provide written notification of removal to a Regulatory Authority at least 7 days prior to the work activity.

- ▽ Where required: Ensure that workers completing the activity have commenced health surveillance requirements. (Must be completed before and after the activity).

- ▽ Where required: Ensure that atmospheric monitoring is completed before, during and at completion of the activity.

Provide results of atmospheric monitoring to workers by posting on site noticeboard and including in consultation processes.

- ▽ Complete a [Risk Assessment](#) and an [ATWP](#) prior to the start of the work activity.
- ▽ Ensure that the work area is excluded from other work activities.
- ▽ Ensure that contaminant removal is completed by competent persons and is transported to an approved waste facility by a licenced contractor.
- ▽ Ensure that workers completing any work activity in the contamination area use required PPE and practice good personal hygiene (per LMP and SWMS).

- ▽ On completion of the work activity, obtain a clearance certificate (from a competent person) confirming that the contaminant has been removed and that there are no remaining risks to human health.
- ▽ Conduct regular visual inspections (so far as is practicable) to ensure compliance with LMP, Risk Register and ATWP controls.
- ▽ Provide information on lead contamination / management to workers during the site consultation processes.

Reference:

AS 4361.2 Guide to Lead Paint Management; Part 2 Residential and Commercial Buildings

ACID SULPHATE

Acid sulphate soil is the common name for soils that contain metal sulphides. In an undisturbed and waterlogged state, these soils may pose no or low risk. When disturbed or exposed to oxygen, acid sulphate soils undergo a chemical reaction known as oxidation which produces sulfuric acid.

Untreated acid sulphate has a significant detrimental impact to eco systems.

Acronyms:

ASS – Acid Sulphate Soil

PASS – potential Acid Sulphate Soil

AASS – actual Acid Sulphate Soil

ASSMP - Acid Sulphate Soil Management Plan

Site Management:

- ▽ Arrange for soil testing to be completed (e.g. Geotech Report) to confirm the location and concentration of ASS.
- ▽ Ensure that an ASSMP is developed by a competent person (e.g. Geotech or Environmental Engineer).
- ▽ Incorporate the requirements of the ASSMP into the Project Risk Register.
- ▽ Ensure that the ASSMP is provided to subcontractors completing the work and/or who will be working in the ASS area.
- ▽ Where required: Ensure that a competent person has been engaged to complete Level 1 Supervision.
- ▽ Determine whether ASS / leachate will be treated on site or disposed of an approved waste facility.
- ▽ Complete a [Risk Assessment](#) and an [ATWP](#) prior to the start of the work activity.
- ▽ Ensure the following:
 - Sufficient quantities of agricultural lime stored on site for treatment and/or emergency use (e.g. leaching).
 - Excavated material is treated / removed within 24 hours of exposure.
 - Stockpiled material is located > 30 metres from any surface water.
 - Stockpiles are limited to approved heights.
 - Stockpiles are bunded with lime to prevent leaching.

- Soil sampling (by ADCO or others) is conducted at a rate of 1 test per 250m³. Sampling tests to be logged on a Register.
- Leachate is tested and neutralised prior to disposal / relocation.
- Dewatering is conducted in accordance with approved procedures.
- Exclusion zones are maintained around work and stockpile areas.

▽ ASS removed from the site:

- Must be loaded into bins lined with agricultural lime.
- Must be disposed of at an approved waste facility / location.
- Must be transported by a licenced contractor.

▽ Ensure that workers completing any work activity in the contamination area use required PPE and practice good personal hygiene (per ASSMP and SWMS).

▽ Ensure that Plant (e.g. excavators), machinery and vehicles are decontaminated prior to leaving the work area and the project site.

Note: Wash off areas to be bunded. Water from wash off may also require neutralising prior to disposal.

▽ Conduct regular visual inspections (so far as is practicable) to ensure compliance with ASSMP, Risk Register and ATWP controls.

▽ Provide information on ASS contamination / management to workers during the site consultation processes.



OTHER CONTAMINANTS

Where any other contaminants which may affect human health or the ecosystem are confirmed / suspected in soil, water or buildings on a project site:

- ▽ Place a hold on all work activities in the immediate area.
- ▽ Contact the SHE Manager in your State or the National SHEQ Manager for advice and direction.

APPENDIX 6- CONSTRUCTION SOIL AND WATER MANAGEMENT SUB PLAN



CIVIL ENGINEERING REPORT: SOIL & WATER MANAGEMENT
PLAN

Institute of Applied Technology for Construction

2-44 O'Connell Street, Kingswood NSW 2747

PREPARED FOR
ADCO
L2 7-9 West Street
North Sydney NSW 2060

Ref: S202025-02-CR01
Rev: 1
Date: 09.12.21

Tel: (02) 8437 5000

Civil Engineering Report: Soil & Water Management Plan

Revision Schedule

Date	Revision	Issue	Prepared By	Approved By
09.12.2021	1	Preliminary	J. Grinsell	J. Gilligan

Northrop Consulting Engineers Pty Ltd

ACN 064 775 088 | ABN 81 094 433 100

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1. General

1.1 Introduction

Northrop Consulting Engineers Pty Ltd (Northrop) have been engaged by ADCO to prepare the Civil Engineering design and documentation in support of a Construction Certificate for the proposed TAFE NSW Institute of Applied Technology for Construction at 2-44 O'Connell Street, Kingswood.

This report covers the works shown as the Northrop Drawing Package required for the development of the site including:

- Erosion and Sediment control.

1.2 Related Reports and Documents

This report is to be read in conjunction with the following reports and documents:

1. Detailed Design Phase Civil Documentation prepared by Northrop:
 - NE-CI-DWG-C01.13 Specification Notes – Sheet 03
 - NE-CI-DWG-C02.01 Sediment and Soil Erosion Control Plan
 - NE-CI-DWG-C02.11 Sediment and Soil Erosion Control Details
2. NSW Department of Housing Manual, "Managing Urban Stormwater Soil & Construction" 2004 (Blue Book)

1.3 The Development

1.3.1 Precinct and Surrounds

The Institute of Applied Technology for Construction is to be located at the TAFE NSW Kingswood Campus, in the suburb of Kingswood within the Penrith Local Government Area (LGA). The site is located at 2-44 O'Connell Street, Kingswood and legally described at Lot 1 in Deposited Plan (DP) 866081. It has an area of approximately 22 hectares (ha) and is bound by the Great Western Highway to the north and O'Connell Street to the west. The site directly abuts two residential properties to the south and the Western Sydney University, Werrington Campus to the east.

Levels in the northeastern portion of the site fall from approx. RL 56.00 AHD to RL 50.00m AHD at an approximate grade of 5-6% where the proposed building location has been identified. This corresponds to approximately 6.0m difference in elevation. Beyond the potential building locations, the surface falls at a similar grade to northwest towards an existing basin with a permanent pond of water at approx. RL 47.00m AHD.

2. Erosion and Sediment Control

The objectives of the erosion and sediment control for the development site will be to ensure:

- Adequate erosion and sediment control measures are applied prior to the commencement of construction and are maintained throughout construction; and
- Construction site runoff is appropriately treated in accordance with Penrith City Council requirements prior to discharge.

As part of the works, the erosion and sedimentation control will need to be provided during the construction phase of the development in accordance with Penrith City Councils requirements and the NSW Department of Housing Manual, "Managing Urban Stormwater Soil & Construction" 2004 (Blue Book) - prior to any earthworks commencing on site.

2.1 Sediment Basin

A temporary sediment basin has been designed to capture site runoff during construction and has been located towards the north eastern side of the site, in the lowest point. The construction of the basin will be undertaken in stages to enable maximum runoff capture assisted by diversion swales and direct runoff to the basin.

Calculations to determine the concept design basin size have been based on available geotechnical information regarding soil types and through the use of the Soils and Construction Volume 1 Manual.

To ensure the sediment basin is working effectively it will be maintained throughout the construction works. Maintenance includes ensuring adequate settlement times or flocculation and pumping of clean water to reach the minimum storage volume at the lower level of the settling zone. The settling zone will be identified by pegs to clearly show the level at which design storage capacity is available.

The pumped water from the sediment basin can be reused for dust control during construction.

Overflow weirs are to be provided to control overflows for rainfall events in excess of the design criteria which caters for a storm event up to and including the 1% AEP storm event.

The concept sediment basin sizing is summarised in the table below. Detailed sediment basin sizing, configuration and location shall form part of the Construction Certificate application.

The sediment basin has been located for future conversion into the permanent water quality basin.

2.2 Sediment and Erosion Control Measures

Prior to any earthworks commencing on site, sediment and erosion control measure shall be implemented generally in accordance with the engineering drawings and the “Blue Book”. The measures are intended to be a minimum treatment only as the contractor will be required to modify and stage the erosion and sedimentation control measures to suit the construction program, sequencing, and techniques. These measures may include:

- A temporary site security/safety fence is to be constructed around the site, the site office area, and the proposed sediment basin.
- Sediment fencing provided downstream of disturbed areas, including any topsoil stockpiles.
- Dust control measures including covering stockpiles, installing fence hessian and watering exposed areas.
- Placement of hay bales or mesh and gravel inlet filters around and along proposed catch drains and around stormwater inlets pits; and
- The construction of a temporary sediment basin as noted above.
- Stabilised site access at the construction vehicle entry/exits.

Any stockpiled material, including topsoil, shall be located as far away as possible from any associated natural watercourses or temporary overland flow paths. Sediment fences shall be installed to the downstream side of stockpiles and any embankment formation. All stockpiles and embankment formations shall be stabilised by hydroseeding or hydro mulching on formation.

2.3 Wet Weather Management

In circumstances of heavy rain sufficient to affect site access and ground conditions the Site Manager should complete a site inspection before work commences. The inspection needs to focus on.

- The suitability of pedestrian access to the amenities and into the construction work areas
- The suitability of access for plant and equipment
- The suitability of ground conditions for plant and equipment to operate
- Nominate the construction zones suitable for work to commence
- Actions to remediate those areas not suitable for work to commence (de-water; prepare ground conditions and access ways etc.)

It is noted that the storage of equipment during wet weather will be placed in areas to not prohibit or disrupt operation of the sediment and soil erosion control measures.

3. Further Commentary

3.1 SSD Conditions

The Minister for Planning and Open Spaces has provided Conditions of Consent for the proposed development at O'Connell Street, Kingswood. Conditions associated with the Construction Soil and Water Management Plan have been provided below with further commentary for consideration by the Certifying Authority.

B14. The Construction Soil and Water Management Plan (CSWMSP) and the plan must address, but not be limited to the following:

(a) be prepared by a suitably qualified expert, in consultation with Council.

(Northrop) Please refer to the CV of the designer provided in Appendix C. ADCO are to approach Penrith Council to initiate discussions regarding the proposed measures to control soil erosion and sedimentation during construction including proposed methods of discharging stormwater from the site.

(b) Incorporate the management and mitigation measures contained within the 'Salinity Assessment and Management Plan (Rev A)' prepared by JBS&G Australia and dated 5 February 2021.

(Northrop) Findings from the JBS&G Report are to be adopted by ADCO on site during the works.

(c) Measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site.

(Northrop) A stabilised site access is to be provided with washdown facilities for vehicle access and egress within the development site and at O'Connell Street Gate 2.

(d) Describe all erosion and sediment controls to be implemented during construction; including as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book'.

(Northrop) Please refer to Section 2 of this report and associated Civil Engineering drawings as listed:

- NE-CI-DWG-C01.13 Specification Notes – Sheet 03
- NE-CI-DWG-C02.01 Sediment and Soil Erosion Control Plan
- NE-CI-DWG-C02.11 Sediment and Soil Erosion Control Details

(e) Provide a plan of how all construction works will be managed in a wet-weather events (i.e., storage of equipment, stabilisation of the Site).

Please refer to section 2.3 of the report.

(f) detail all off-Site flows from the Site; and

Once stormwater is collected in the sediment basins and flocculated, clean water is to be discharged to existing site stormwater infrastructure within the development site and / or overland.

(g) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to, 1 in 5-year ARI.

Please refer to Section 2 of this report and associated Civil Engineering drawings as listed:

- NE-CI-DWG-C01.13 Specification Notes – Sheet 03
- NE-CI-DWG-C02.01 Sediment and Soil Erosion Control Plan
- NE-CI-DWG-C02.11 Sediment and Soil Erosion Control Details

The erosion and sediment control plans have been designed in accordance with the requirements of NSW Department of Housing Manual, “Managing Urban Stormwater Soil & Construction” 2004 (Blue Book).

Surface flows generated during storm events up to the 1 in 5-year storm event are directed over land or within the constructed pit and pipe network to the sediment basin. Stormwater runoff that has accumulated in the basin is to be flocculated prior to discharge to the existing stormwater system.

Storm events greater than the 1 in 5 year will still experience flows being directed to the sediment basin however the site will likely become overwhelmed as temporary control measures are not typically sized to cater for such events both in the Blue Book and Council’s requirements. Stormwater will likely overtop the basin and spill to open areas downstream of the works.

Appendix A – Soil & Water Management Plans

REVISION	DESCRIPTION	ISSUED	VER'D	AP'D	DATE
A	ISSUED FOR CROWN DESIGN VERIFICATION CERTIFICATE	20		J6	2011.21

CLIENT

NSW GOVERNMENT

TAFE NSW

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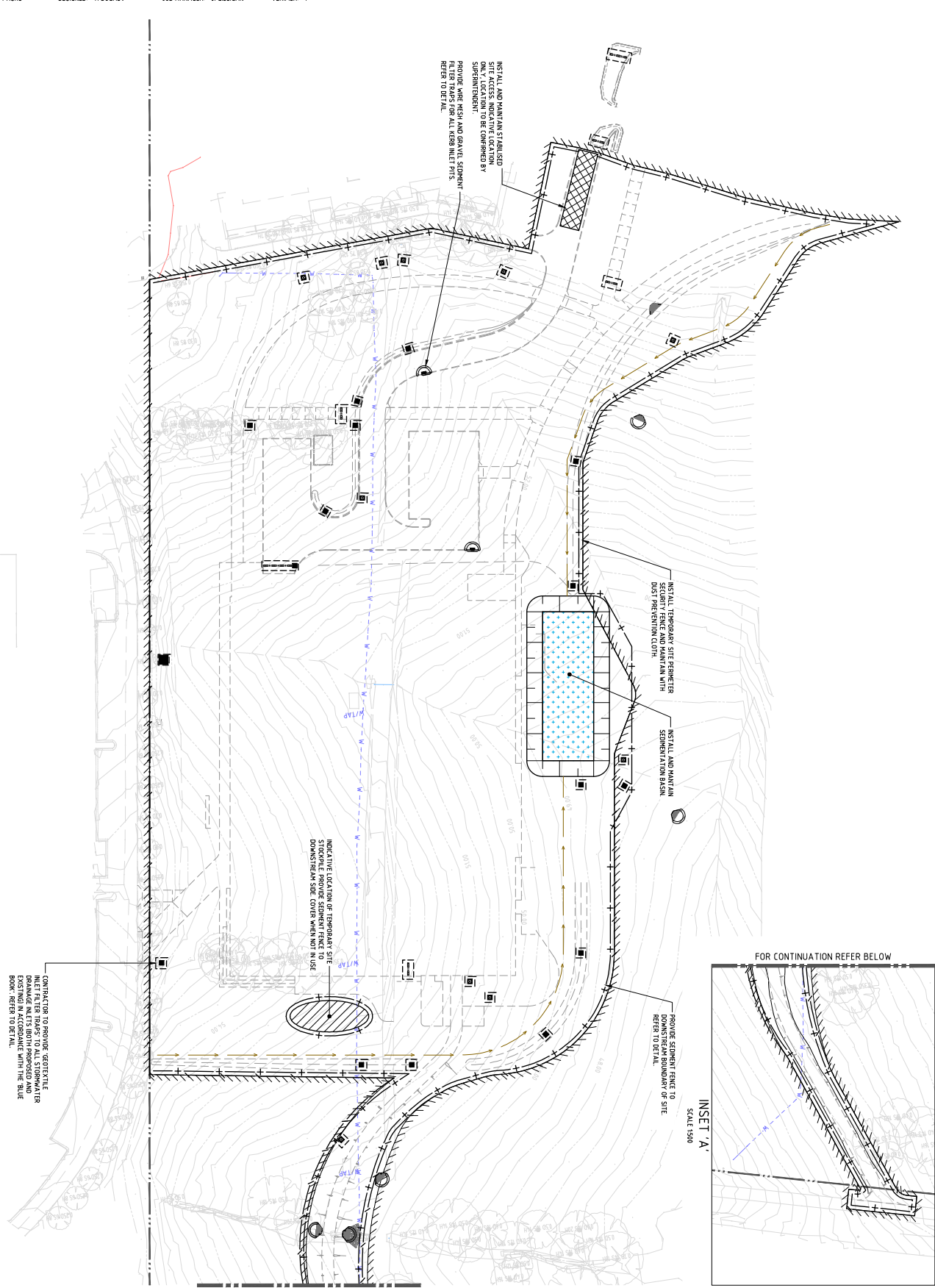
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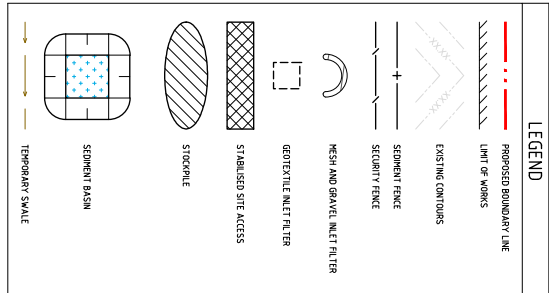
PROJECT
INSTITUTE OF APPLIED
TECHNOLOGY FOR CONSTRUCTION
12-44 O'CONNELL ST,
KINGSWOOD NSW 2747

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
SEDIMENT AND SOIL EROSION
CONTROL PLAN

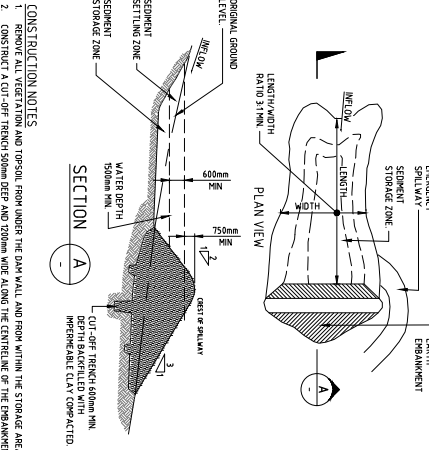
DRAWING NUMBER		NE-CI-DWG-C0-02.01
JOB NUMBER	REVISION	
202025	A	
DRAWING SHEET SIZE = A1		



SITE PARAMETERS	
CONSTRAINT	VALUE
TOTAL DISTURBED AREA (ha)	27
SOIL TEXTURE GROUP	F
DESIGN RAINFALL (DEPTH DAYS)	5.0
DESIGN RAINFALL DEPTH (PERCENTILE)	80.0
X-DAY-Y PERCENTILE RAINFALL EVENT	27.4
C _v	0.4
SETTLING ZONE VOLUME (m ³)	305
SEDIMENT STORAGE VOLUME (m ³)	852
TOTAL BASIN VOLUME (m ³)	457



NOT FOR CONSTRUCTION



1. REMOVE ALL VEGETATION AND SOIL FROM UNDER THE DRY WALL AND ROOM WITHIN THE STORAGE AREA.
2. REMOVE THE EXISTING CONCRETE FLOOR, AND THE CONCRETE OF THE FOUNDATION.
3. EXTEND TO A POINT ON THE EXTERIOR WALL, LEVEL WITH THE ROOF EAVES.
4. MAINTAIN THE TRENCH FREE OF WATER AND OCCUPANT. THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SCHEDULE TO THE STANDARD PRACTICE DENSITY.
5. SELECT 10 TO 15 PER CENT STAMP PUNCH FOR DENSITY.
6. THE EXISTING CONCRETE WALL IS FREE OF CRACKS, HOLE, ROCK, LUMPY STONE, OR FOREIGN MATERIAL.
7. THE CONCRETE OF THE FOUNDATION IS REPAIRED TO 10 IN. (25.4 CM) DEPTH TO THE POINT OF CRACK TO FALL TO THE EXISTING SURFACE.
8. SPREAD THE 10 IN. (25.4 CM) TO 15 IN. (38.1 CM) LAYER OF GRAVEL TO THE EXISTING SURFACE.
9. RECONSTRUCT THE STRUCTURE FOLLOWING THE SCHEDULE TO THE STANDARD PRACTICE DENSITY.

(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY)
EARTH BASIN - WET

Appendix B – CV



James Gilligan

Associate | Senior Civil Engineer

BE (Civil) MIEAust CPEng NER

James is a Senior Civil Engineer with over 14 years' experience managing and delivering buildings and complex civil infrastructure projects requiring design from the concept phase through to construction and post construction stages.

James also has particular experience in project management and contract administration. James' technical background includes civil design of utilities, earthworks, stormwater and roads for subdivision and buildings projects across all types of development including Education, Residential, Commercial & Industrial.

Project Experience

Urban Redevelopment

- St Leonards South Precinct
- Frasers Central Park, Broadway
- Tailors Walk, Pemberton Street, Botany
- 150 Epping Road, Lane Cove
- Glebe Affordable Housing Project, Glebe
- Altrove Stage 7 & 9, Schofields
- Airds Subdivision Works, Airds
- Pemulwuy Southern Lands, Pemulwuy
- Stellar Apartments, Ryde
- 10 Hall Street, Bondi
- McEvoy Street, Waterloo

Public Domain and Open Spaces

- Endeavour Energy Southern Carpark, Huntingwood
- Windsor Station Bus Interchange, Windsor
- Waterfall Station Easy Access Upgrade
- New Acton South Carpark, Canberra
- Elara Neighbourhood Centre, Elara
- Hurstville Bus Interchange, Hurstville
- Twin Creeks Golf Club, Luddenham
- Croom Regional Sporting Complex, Croom

Infrastructure / Utilities Coordination

- Southern Sydney Freight Line
- Northwest Rail Link
- Sydney International Airport – Stage 2B

Health

- Manly AYAH
- Bungaribee House Relocation, Blacktown
- Bunya Facility, Blacktown
- Cumberland West Mental Health Facility
- Westmead Mental Health Facility

Commercial / Industrial

- Ingram Micro Warehouse
- Goodyear Warehouse
- 1-5 Interchange Drive, Eastern Creek
- 2-4 Interchange Drive Eastern Creek
- 9-11 Interchange Drive, Eastern Creek
- 17-19 Interchange Drive, Eastern Creek
- 21-23 Interchange Drive, Eastern Creek
- Bunnings Distribution Centre, Eastern Creek
- Basalt Road, Greystanes
- Blum Australia Warehouse, Hoxton Park
- Masters Home Improvement, Penrith
- Masters Home Improvement Wagga Wagga
- AMP Shopping Centre, Glenmore Park
- Kingsford Smith Distribution Centre, Mascot
- Danks Hardware Distribution Centre

Education

- Edmondson Park Primary School
- Galungara Public School
- Jordan Springs Public School
- Catherine Field Public School
- East Leppington Public School
- Estella Public School
- Googong Public School
- Murrumbateman Public School
- Westmead Catholic College
- St Joseph's College, Hunters Hill
- Barker College Junior School and Early Learning Centre
- Kingswood TAFE
- Meadowbank TAFE
- Western Sydney University, Westmead

Appendix C - Consultation Record