RICHARD CROOKES
CONSTRUCTIONS

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

BAIADA OAKBURN POULTRY PROCESSING FACILITY

PROJECT: 1310

SSDA9394-CEMP-OPP-1a

6th July 2023

HEAD CONTRACTOR:	Richard Crookes Constructions (RCC)
CLIENT:	Baiada Group
PROJECT:	Oakburn Poultry Processing Facility
PROJECT NUMBER:	1310
REPORT TITLE:	Baiada OPP – Construction Environmental Management Plan
DATE:	6/07/2023
DOCUMENT NUMBER:	SSDA9394-CEMP-OPP
REVISION NUMBER	Revision 1a

REVISION	DATE	REASON FOR REVISION	PM'S INITIALS
1	23/06/2023	Initial Report	MW
1a	6/07/2023	***Updated References in SSD Compliance Matrix***	MW

APPROVAL TABLE		APPROVALS - INITIAL					
PROJECT POSITION	NAME	20/6					

1 SSDA REQUIREMENTS COMPIANCE MATRIX

SSDA REQUIREMENTS COMPLIANCE MATRIX		
CONDITION	**CONDITION CRITERIA**	**LOCATION WITHIN CEMP**
C1	A) Detailed baseline data;	Sections 2 & 3
	B) details of: (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 5.4
	(ii) any relevant limits or performance measures and criteria; and	Sections 5.3 & 8
	(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Sections 5.3, ***7.8*** & 8
	C) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 8
	D) a program to monitor and report on the: (i) impacts and environmental performance of the development;	Section ***7.2 & 7.8***
	(ii) effectiveness of the management measures set out pursuant to paragraph (C) above;	Section ***7.8 & 7.12***
	E) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Sections 7.5, 7.6, ***7.7,*** 7.8, **7.9**
	F) a program to investigate and implement ways to improve the environmental performance of the development over time	Section ***7.10***
	G) a protocol for managing and reporting any: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria).	Sections 7.5, 7.6, ***7.7,*** 7.8, **7.9**
	(ii) complaint.	Section 7.4
	(iii) failure to comply with statutory requirements; and	Section ***7.7 & 7.8***
	H) a protocol for periodic review of the plan.	Section 4, 7.10 & ***7.12***
C3	The applicant must prepare a CEMP in accordance with the requirements of condition C1 and to the satisfaction of the Planning Secretary.	This document
C3	As part of the CEMP required under condition C2 of this consent, the Applicant must include the following: A) Erosion and Sediment Control Plan;	Section 9
	B) Construction Noise Management Plan;	Appendix C
	C) Construction Traffic Management Plan;	Appendix D
	D) Community Consultation and Complaints Handling.	Section 7.4, Appendix E

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2 SYSTEM APPLICATION

2.1 PLANNING ENVIRONMENTAL MANAGEMENT

Richard Crookes Constructions is committed to safely construct the project, on time and on budget, without harm to the environment.

This plan, prepared by Richard Crookes Constructions, sets out the procedures Richard Crookes Constructions will implement to manage our site activities from an environmental perspective to:

- Ensure compliance with the Environmental Requirements and Statutory Requirements
- Maximise the achievement of the Environmental Objectives.

The Construction Environmental Management Plan addresses:

- All Environmental Requirements
- All Statutory Requirements
- All Environmental Objectives
- The roles and responsibilities of Richard Crookes Constructions and subcontractor personnel (including Richard Crookes Construction key people) regarding the Environment
- The training and awareness programmes provided to personnel regarding the Environment
- The procedure for preparing and finalising the Environmental Management Plan
- The procedure for regularly identifying, controlling and monitoring possible and actual impacts on the Environment associated with the works, including the procedures for recording, reporting, responding to and finalising:
- Matters arising out of or in connection with such identification, control and monitoring
- Complaints, incidents (including Environmental Incidents), near misses and other situations or accidents regarding the Environment during the works
- The procedure for regularly reviewing, updating and amending the Environmental Management Plan (including as a result of any complaint, incident (including Environmental Incidents)
- The procedure for ensuring subcontractor compliance with the Environmental Management Plan
- The procedure for regularly auditing or other monitoring of the Environmental Management Plan, including the procedures for recording, reporting, responding to and finalising:
  - matters arising out of or in connection with such audits or other monitoring.
  - complaints, incidents (including Environmental Incidents), near misses and other situations or accidents regarding the Environment
  - The additional matters specified in the Contract Particulars.

2.2 PREPARATION AND APPLICATION

This Construction Environmental Management Plan (CEMP) has been prepared to document the company's environmental commitments, objectives and procedures for the project.

This document is structured in the following principles:

- A description of the site and project scope
- Establishing the environmental legal framework and objectives that the project will be operating under
- A description of the standard approach of Richard Crookes Construction environmental management system, including reporting and monitoring
- An outline of roles and responsibilities for the project, including site staff and Richard Crookes Construction management support teams
- A project specific risk assessment that analyses the risks under each aspect, presenting the logic/research behind the findings or recommendations and accompanying management strategies, recommendations, or controls

- An outline of Richard Crookes Construction Standard Environmental Protocols (SEPs) represented in the tables at the back of the CEMP, that address the standard controls against each of those environmental risks

This document is prepared by Richard Crookes Construction Environmental Manager for review and implementation by Richard Crookes Construction project team.

The CEMP is a live document that may require review and update. A review of the CEMP may be triggered by the following:

- Once the planning phase is complete
- Additional scope of works for which the impact to environment was not anticipated.
- In response to environmental incidents, near-misses and/or other situations or accidents on Commonwealth property or the Site
- In response to complaints that have been investigated and may have some validity.

In the event the CEMP required updating, this must be reviewed and approved by the Environmental Manager and the Project Manager.

As this CEMP in referenced in all Subcontract's, it forms part of the Subcontractor's contract to comply with the requirements and obligations provided under this plan. As such it should be maintained as a controlled and accessible document, that is formally transmitted during package tenders and transmitted to them once the tenderer is successful.

2.3 PLAN REVIEW (DURING PROJECT DELIVERY)

The Construction Environmental Management Plan, its operation and implementation, and any elements of the overarching Environmental Management System must be periodically reviewed during project delivery.

Formal review of the CEMP must be implemented for currency and applicability at least once every 6 months. Other triggers for review may include:

- Corrective or Preventative Actions are raised through the reporting process requiring amendments to
- the CEMP
- Changes to relative legislative, regulatory or compliance obligations
- Significant changes to any constituent of project construction
- Request by the Client or any regulatory authority
- Significant changes to the environment
- Changes to Best Practice Environmental Management or
- Identification of new environmental risks.

The Environmental Representative (or Project Manager nominee) will be responsible for review and amendment of the CEMP. If updated at any stage of the project, a revised copy will be submitted to all relevant stakeholders.

3 PROJECT DESCRIPTION

3.1 SCOPE OF WORKS

The Baiada OPP Project, subject of SSD Approval 9394, consists of the construction of a Poultry Processing Plant on land at 1154 Gunnedah Road, Westdale in Tamworth, consisting of:

- 38,936m2 of Gross Floor Area providing for live bird storage, processing, chilling, cold store and distribution facilities;
- 1,600m2 workshop and store building;
- 3,791m2 of ancillary administration, staff amenities and childcare space;
- Expanded Waste Water Treatment Plant; and
- Installation of ancillary infrastructure, landscaping and services.
- Construction of a new access driveway via an easement connecting to Armstrong Street via Workshop Lane;
- Construction of a new staff car parking area providing 820 car parking spaces;
- Site landscaping and screening vegetation;

The proposed construction activities shall be staged across three stages, that being:

- **Stage 1 Early Works**
  - Construction of a new access road from Workshop Lane to the southeast corner of the site
  - Site establishment
- **Stage 2 Early Works**
  - Bulk earthworks
  - Relocation and / or diversion of services
  - Construction of gatehouse precinct – building and weighbridges
- **Stage 3 Main Works**
  - Construction of all new buildings
  - Infrastructure services
  - Construction of remaining hardstand areas and internal access roads
  - Landscaping and Installation of car park areas.

3.1.1 DURATION OF THE WORKS

The construction is expected to commence in August 2023 and be completed by December 2025, for a total period of 28 months.

Construction of the new access road will be undertaken initially.

Once the new access is commissioned, the rest of the Stage 1 and Stage 2 construction works (including site demolition, establishment works and earthworks) will then be conducted within the site. The Stage 3 main construction works will occur after the early preparation works.

3.1.2 SITE ESTABLISHMENT

Site preparation works comprised of the following activities:

- Temporary Fencing to suit staging and separation from Baiada operations.
- Removal of existing fencing where required.
- Sitewide Demolition – refer drawing A502-TE-AR-DRG-SW-0101
- Installation of and maintenance of erosion and sediment control measures, in accordance with the relevant requirements of the Managing Urban Stormwater: Soils and Construction – Volume 1: Blue Book (Landcom, 2004)
- New Site wide fencing to perimeter – refer drawing A502-TE-AR-DRG-SW-0140.Note: The temporary fences will be maintained and relocated as and where required to suit staging and to maintain constant separation between construction works and Baiada operations.

Establish Early Works Site Compound & amenities including:

- Preparation of compound hardstand.
- Supply and install of the staff and workers' compound including office, lunch sheds and amenities.
- Supply and install of the temporary fencing and gates around the site compound.
- Establish temporary site office for Baiada staff in a location near the Rendering Plant.

3.1.3 ROADWORKS

Roadworks consists of the construction of New Internal and External Access Roads and includes the following activities:

- Survey and set out of roadways as required.
- Strip and stockpile topsoil on site at locations as indicated by site management, including stockpile management and erosion and sediment control (e.g., cover the stockpile to prevent stockpile erosion).
- Cut and fill operations as required, fill material for the proposed roadways to be sourced from the proposed carpark on the eastern side and minimise depth until new road fully completed.
- Supply and Installation of all stormwater drainage as detailed.
- Supply and construction of all road pavements.
- Form, reinforce and place concrete as required for roads including construction joints, concrete curing, etc.

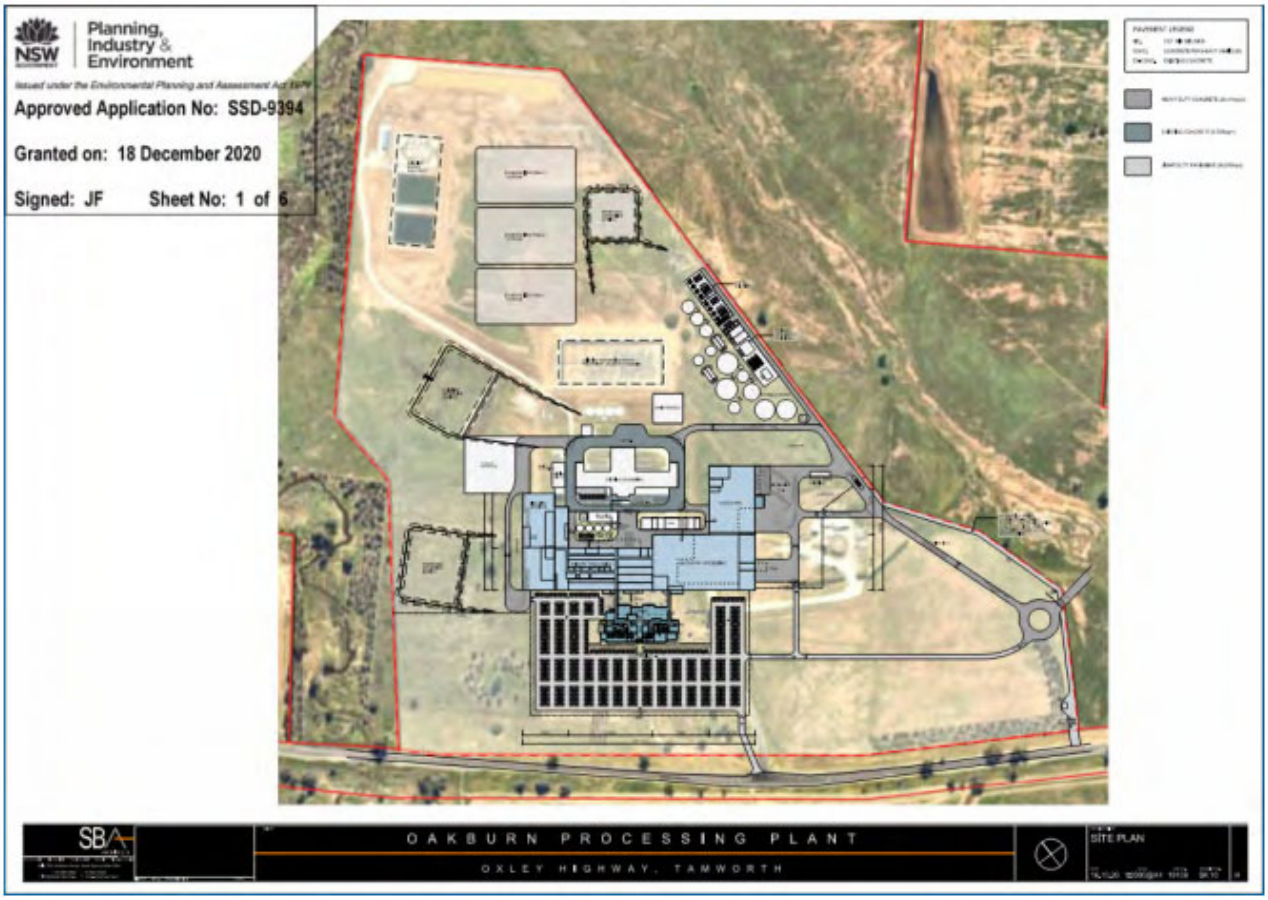

Figure 3.1.3: Oakburn Processing Plant – Site Plan

3.1.4 SERVICES DIVERSIONS

To enable the bulk earthworks activities to commence several services need to be relocated or diverted from within the bulk earthworks' footprint. Services to be relocated or diverted include:

- HV Electrical

- Gas
- Water
- Fire services
- Communications
- Trade waste
- Sewer
- Electrical / Communication / Security

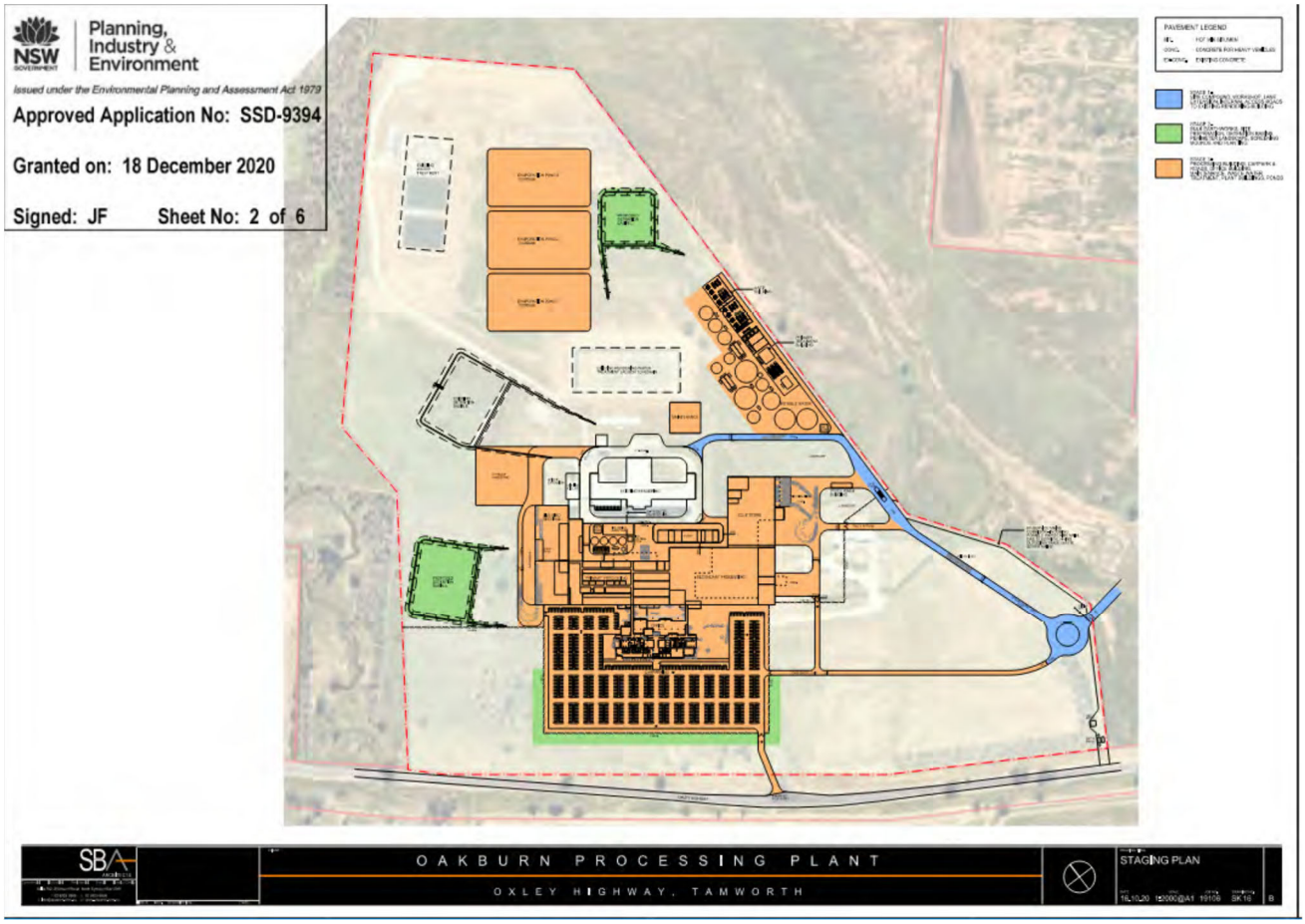

Figure 3.1.3: Oakburn Processing Plant – Staging Plan

3.1.5 BULK EARTHWORKS

Bulk earthworks include preparation for the building pads (footprint), carparks, roadways, hardstand areas, and consists of the following activities:

- Survey and set-out building footprints and other designated earthworks areas.
- Strip and stockpile topsoil to agreed locations, including stockpile management and erosion and sediment control (e.g., cover the stockpile to prevent stockpile erosion).
- Cut and fill operations for all required building pads and related areas.

3.1.6 GATEHOUSE & WEIGHBRIDGE

Construction of gatehouse & vehicle weighbridge to engineer's design and specification.

3.1.7 MAIN PROCESSING BUILDING

The construction of a 35 000 sqm poultry processing building comprised of a concrete substructure, steel superstructure and metal clad façade and roofing. Construction activities for the main processing facility also include the internal fit-out, including installation of services and building finishes.

3.1.8 ADMIN BUILDING

The construction of an administration building consisting of offices and amenities. Activities for the admin building include the construction of a concrete substructure, and steel framed superstructure as well as the internal fit-out, including installation of services and building finishes.

3.1.9 EXTERNAL CARPARKS

The construction of two external carparks and associated civil infrastructure.

3.1.10 MAINTENANCE BUILDING

The construction of a maintenance building comprised of a steel structure, and metal clad exterior.

3.1.11 WATEWATER TREATMENT PLANT

The construction of a wastewater treatment plant including pumps, tanks and associated services infrastructure.

3.2 SITE LOCATION AND DESCRIPTION

The Baiada Oakburn Poultry Processing Facility site is situated in Westdale, Tamworth. Areas of environmental value adjacent to the site include:

- Oxley Highway (to the South-west);
- Tamworth Regional Airport (to the South).
- Lincoln Grove Memorial Park (to the South-east)
- Bolton Creek (to the North-West)
- Existing Baiada Rendering Plant and ancillary facilities.

Figure 3.2: Location plan of Early Works site and surrounds

4 PROJECT ENVIRONMENTAL RISK ASSESSMENT

Potential environmental obligations and risks associated with RCCs projects will be identified in the project risk workshop, refer procedure - **QAP-7.5-007.**

Additionally, environmental impacts associated with trades/activities etc will be identified using the Environmental Risk Matrix, Appendix 1.

The Environmental Risk Matrix will be reviewed (minimum 6 monthly, or when changes to methodologies are identifed) and updated as required. Where risks are identified as medium to high in the matrix, the impacts associated with RCC's activities, Contractual requirements, DA conditions, SSD conditions, Products and services will be deemed as "significant" and require operational controls as described in Appendix section 4.3.

The Environmental Risk Matrix will be provided to subcontractors and suppliers as part of the subcontract and supply contracts. Environmental aspects with a residual risk level of 'High' or 'Extreme' are considered as significant environmental aspects and are to be communicated to all personnel as part of the site induction process

5 PROJECT FRAMEWORK AND OBJECTIVES

5.1 RICHARD CROOKES CONSTRUCTIONS ENVIRONMENTAL OBJECTIVES

The objective of Richard Crookes Construction's Environmental Management is to undertake these activities in full consideration of Environmental requirements of Contracts, applicable legislation and as an environmentally responsible organisation of the broader community.

To this end Richard Crookes Constructions has established and maintains an Environmental Management System planned and developed with all management functions in accordance with AS/NZS ISO 14001: 2015 - Environmental Management Systems to control and minimise environmental impacts and preserve the environment through the following:

- The control and minimisation of contaminate discharges or disturbances to air, land and water
- The control and minimisation of waste
- To review and re-source component materials, as opportunity presents
- Undertake regular review of the documented Environmental Management System against performance targets with the view toward continual improvement and the prevention of pollution.

Proper adherence to the Environmental Management System and active participation in environmental issues pertinent to Richard Crookes Construction's activities is a requirement of all Richard Crookes Constructions personnel and those entities engaged by Richard Crookes Constructions in the delivery of projects.

5.2 PRINCIPAL'S EXPECTATIONS / PROJECT ENVIRONMENT COMMITMENT

The Richard Crookes Constructions Project Team is committed to the implementation of a comprehensive and effective EMS for the design and construction of this project.

Our Construction Environmental Management Plan will comply with all elements of the Richard Crookes Constructions Environmental System, certified to ISO 14001. It will embrace all elements of managing the design and construction of the Project to ensure full compliance with the requirements of the current legislation and expectations of the Principal and neighbouring community.

The Construction Environmental Management Plan and its application will be continuously assessed and improved through processes of review and audit.

All participants in the project are responsible for implementing the CEMP and contributing to its improvement in order to ensure we meet our objective of providing a project which meets agreed requirements in terms of its construction and operational performance.

5.3 KEY PERFORMANCE INDICATORS

Adherence to Richard Crookes Construction environmental management targets will be monitored using the KPIs listed in table 1 below. As per Richard Crookes Construction environmental monitoring and continual impact assessment, further performance measurements will be implemented/adjusted as required.

POLICY	OBJECTIVE	MEASUREMENT BASIS	TARGET	RESPONSIBILITY
Minimise Impacts	Minimise the impact of the site works to the receiving environment.	Internal audits conducted by Management	No more than 5 environmental Corrective Action items issues to a single project from an internal audit. Zero Non-Conformances issues as a Result Project is audited within 3 months of being established on site.	Project Manager
Minimise Noise	Minimise the impact of construction noise to the receiving environment.	At commencement of Civil works & weekly environmental inspection thereafter.	No complaints, incidents, or fines.	Project Manager
Minimise Vibration	Minimise the impact of vibration to the receiving environment.	At commencement of Civil works & weekly environmental inspection thereafter.	No complaints, incidents, or fines.	Project Manager
Manage Air Quality	Minimise the level of dust arising from construction activities.	At commencement of Civil works & weekly environmental inspection thereafter.	No Dust complaints.	Project Manager
Minimise Erosion	Prevent/minimise erosion via the establishment of erosion & sediment controls.	At commencement of Civil works & weekly Environmental inspection thereafter.	No run-off or pollution to surrounding environment. No incidents or fines.	Project Manager
Spill Response	Maintain adequate spill response plan and equipment.	At commencement of Civil works & weekly environmental inspection thereafter.	No spillages, incidents, or fines.	Project Manager
Water Quality	Minimise the impact of construction activities to environmental water quality.	At commencement of Civil works & weekly environmental inspection thereafter.	No pollution to surrounding waterways. No waste of water or contamination. No incidents or fines.	Project Manager
Fire Protection	Prevent the incidence of fires arising from construction work.	At commencement of Civil works & weekly environmental inspection thereafter.	No fires, incidents, or fines.	Project Manager
Compliance	Comply with all Statutory Requirements	Commonwealth, State and Local Council regulation	Zero Penalty Infringement Notices issued by Local Council or State EPAZero Prosecutions issued by Local Council or State EPA	Project Manager
All	Nil Complaints on the project	Nil	Zero Complaints recorded in the complaints and incidents register as shown in Appendix E	Project Manager
EPA's Interim Construction Noise Guideline (DECC, 2009)	Noise levels within standards established in the CNMP	At commencement of Civil works	Noise levels to be recorded within standards established in the CNMP and regulatory framework	Project Manager
All	Nil environmental impacts on surrounding site areas	CARs	Nil CARs issued	Project Manager

5.4 REGULATORY FRAMEWORK

Development on the site is to be carried out in a manner that avoids significant adverse impacts to the onsite and surrounding environment and which gives appropriate regard to the provisions of the following (but not limited to) Commonwealth and State legislation:

- Aboriginal Cultural Heritage Act 2003
- Biodiversity Conversation Act 2016
- Building Act 1975
- Environmental Protection Act 1994
- National Parks and Wildlife Act 1974
- Sustainable Planning Act 200
- Transport Infrastructure Act 1994
- Vegetation Management Act 1999
- Water Act 2000.
- Environmental Protection Licence (EPL) - 7566
- Development consent SSD-9394
- EPA's Interim Construction Noise Guideline (DECC, 2009)
- POEO Act 1997
- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Regulation 2000

Quarterly audits and weekly checklist reviews on the project will ensure compliance with the CEMP and the regulations such as those referenced above. Richard Crookes Constructions will ensure compliance with the EPL 7566 issued to the licensee (Baiada Poultry Pty Ltd), and with the SSD-9394, and will make necessary arrangements to enable the licensee to continue fulfilling its obligations under the licence, i.e. the operation of complaints telephone line. Where an environmental performance requirement exists in both SSD-9394 and EPL 7566, Richard Crookes Constructions will ensure conformance to the more stringent requirement.

The Richard Crookes Constructions site team are to have the above regulations, licenses and development consent available in the site office.

6 PROJECT ORGINISATION

6.1 PROJECT ORGINISATIONAL CHART

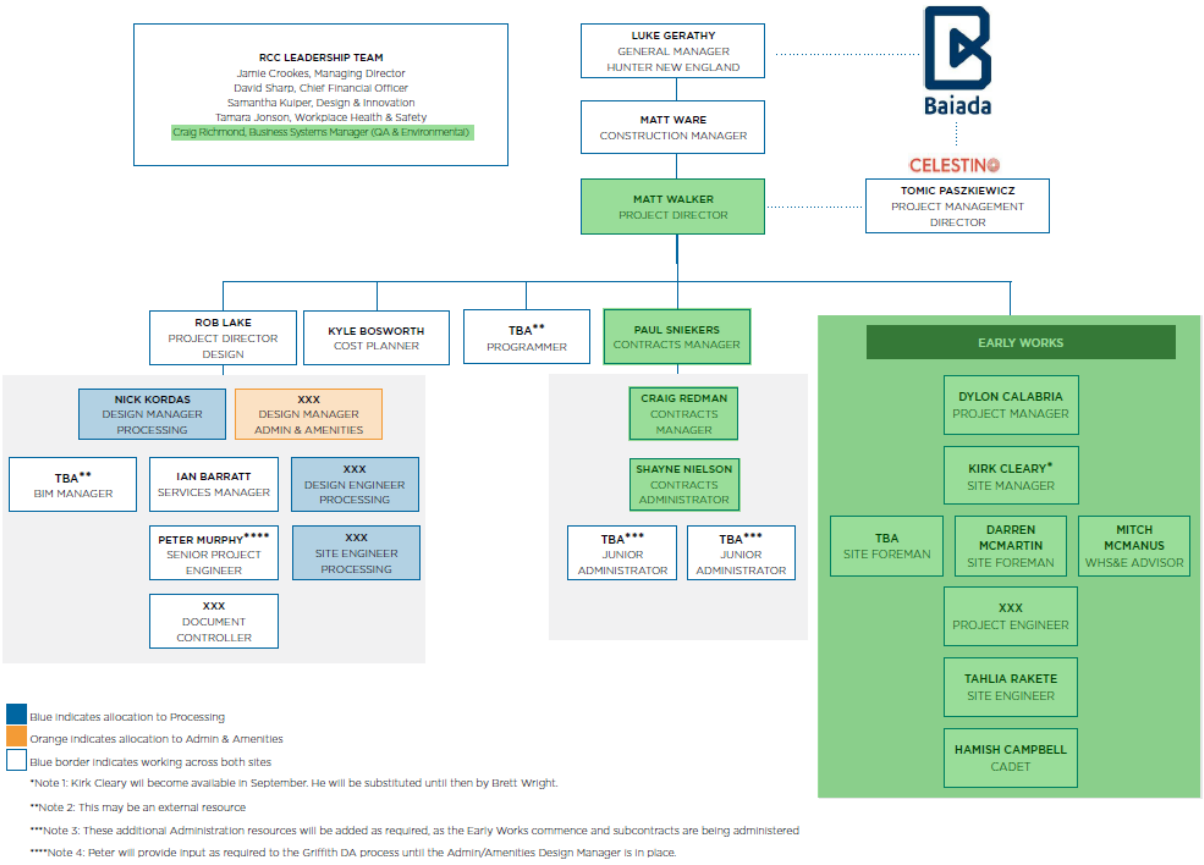

Figure 6.1 – Organisational chart – Full size copy included in Appendix F

6.2 ROLES AND RESPONSIBILITIES

6.2.1 PROJECT DIRECTOR

The Project director has responsibility to:

- Ensure construction activities are undertaken in accordance with Richard Crookes Constructions Environmental Policy and the objectives and provisions of the CEMP
- Ensure all staff carrying out functions which may create a significant impact on the environment are appropriately trained to a level commensurate with their role and responsibilities in the project.

6.2.2 BUSINESS SYSTEMS MANAGER (QA & ENVIRONMENTAL)

The Safety and Environmental Manager is responsible for establishing and maintaining the Company's Environment Management System and represents Richard Crookes Constructions on all environmental matters pertinent to the EMS.

The Safety and Environment Manager is responsible for:

- Assisting the Project Manager with the implementation of the CEMP
- Providing support and technical assistance to the Project Environmental Coordinator
- Monitoring the effectiveness of the Environmental Management System.

The Safety and Environment Manager is authorised to require all employees to comply with the provisions of the documented Environmental Management System and may issue directions to that effect.

6.2.3 PROJECT MANAGER

The Project Manager is responsible to the General Manager through the Operations Manager to ensure effective environmental controls are implemented for the duration of the project.

Specifically, the Project Manager shall be responsible for the:

- Implementing and maintaining the CEMP
- Reviewing the environmental aspects at project start-up and ensuring the CEMP addresses all requirements
- Providing guidance, motivation and resources to achieve the provisions of the CEMP
- Ensuring that subcontractors and suppliers are aware of Richard Crookes Constructions environmental policy and objectives, through conditions of contract, tender interviews, scopes of work and site environmental inductions as applicable
- Establishing monitoring records and ensuring the scope and frequency of monitoring activities satisfies the requirements of the CEMP

The Project Manager shall have sufficient authority and independence to:

- Identify and record any environmental problems
- Initiate solutions to the environmental problem
- Stop the works, if such a decision becomes necessary, in order to prevent or mitigate adverse environmental conditions, or if corrective measures recommended are not being carried out
- Provide recommendations for EMS and operational improvements to the Safety and Environmental Manager

6.2.4 WHS&E ADVISOR

The WHS&E Advisor is responsible to the Project Manager for the maintenance of the Project Environmental Management system.

The WHS&E Advisor is the document controller for the CEMP and shall prepare/compile registers, records, plans and forms necessary for the implementation of environmental controls. The WHS&E Advisor shall review these as necessary and ensure timely distribution to all relevant parties in the Project.

Responsibilities of the WHS&E Advisor shall include:

- Monitor the construction processes to ensure that appropriate environmental protection/procedures are in place
- Identify and record any environmental issues
- Recommend and initiate solutions to environmental problems and verify the implementation of solutions
- Investigate all environmental complaints (which shall be recorded on the project records)
- Control and maintain project environmental records, including indexing records, prior to archiving
- Implement any environmental checklists, field records and procedures as applicable to the works
- Maintenance the CEMP and control of distribution
- Provide recommendations to the Safety and Environment Manager for EMS and operational improvements.

6.2.5 INDEPENDENT VERIFICATION STAFF

Individual employees or consultants may be appointed to assist the Quality & Environmental Coordinator to carry out environmental testing and inspection duties. This testing and inspection may be in addition to and separate from any testing and inspection required for Environmental Management purposes.

Independent Verification staff will not be drawn from personnel who are performing or directly supervising the activities being inspected.

6.2.6 SITE MANAGER

The Site Manager's responsibilities include:

- Ensure all work under the Site Manager's control is undertaken in accordance with statutory environmental requirements and the CEMP.
- Identify, recommend and initiate solutions to any project environmental issues
- Ensure all workers and subcontractors under the Site Manager's control are properly inducted in the requirements of the Richard Crookes Constructions Environmental Policy and objectives and CEMP, and instructed in the following:
  - The role and environmental responsibilities of the project/works for which they are engaged
  - The use and understanding of any environmental documentation for the work
  - Specific environmental procedures for the project/works.

6.2.7 FOREMAN

The Foreman is responsible to the Site Manager to:

- Ensure all work under the Foreman's control is undertaken in accordance with statutory environmental requirements and the CEMP
- Identify, recommend and initiate solutions to any project environmental problem.

6.2.8 CONTRACT ADMINISTRATOR

The Contract Administrator shall be responsible to the Project Manager for:

- Ensuring proper procedures are followed for the procurement of goods and services to ensure that Richard Crookes Constructions environmental policy and objectives and the requirements of the CEMP are achieved.

6.2.9 SUBCONTRACTORS AND SUPPLIERS

Richard Crookes Constructions will ensure all subcontractors and suppliers are responsible for conducting their activities in an environmentally sensitive manner and in compliance with the requirements of this CEMP; ISO 14001 and any works environment management plans.

Site inductions will include detailed and site specific environmental information. Any trade likely to have a high impact on the environment is required to submit an CEMP, which is assessed using the "Subcontractor CEMP assessment checklist" to ensure it is comprehensive.

All personnel shall notify the Richard Crookes Constructions Site Manager of any activity or incident, or any deviations from work place practices and procedures set out in this CEMP.

Subcontractor audits can be conducted. The standard audit checklist on the intranet contains environmental criteria which can be adapted to the nature of the trade work.

Subcontractors shall ensure their personnel working at the site:

- Have the appropriate environmental awareness training and / or qualification for the task undertaken
- Are aware of the potential environmental impacts of their activities on the site and the procedures by which such impacts are to be minimised or prevented.

7 IMPLIMENTATION

7.1 LEGAL AND OTHER REQUIREMENTS

Construction of the Baiada OPP Early Works project must not commence until this CEMP is approved by the Planning Secretary.

The Safety and Environment Manager is responsible for identifying and assessing amendments to statutory and regulatory requirements potentially applicable to the project and initiating a review of the CEMP as warranted.

7.2 MONITORING

7.2.1 INSPECTIONS AND FIELD TESTING

Environmental site inspections will be undertaken using Form 18.3 located on Hammertech at a frequency listed in the Site Task Checklist. The form is to be made site specific based on the identified risks.

Field testing of water collected on site (excavations, trenches, paint washout etc) will be tested prior to discharge and results record on the Dewatering & Field Test Sheet. Form 18.6

Other inspections and testing will be performed as required by associated sub-plans.

7.2.2 PERFORMANCE OF THE EMP

The Project EMP will be monitored following implementation:

- Environmental operational controls are being effectively applied;
- Project specific environmental monitoring targets specified in the Development Consent or other planning permits for air, water and noise are met;
- Unpredicted impacts are identified and remedial action is taken; and
- The project objectives being met.

Responsibilities for monitoring and compliance requirements are detailed in the Project Environmental Plans.

Monthly reports are provided to the RCC Directors for review and the performance of projects against RCC's company objectives and targets is reviewed on a quarterly basis.

7.3 CONSULTATION

7.3.1 TRAINING

Prior to the commencement of project activities, all site personnel (including sub-contractors) will attend a site induction. This will include an outline of the requirements of this CEMP and the responsibilities and accountabilities of all site personnel.

The project environmental site rules will be included in the induction session.

Training records will be kept to verify who has attended the training.

7.3.2 COMMUNITY CONSULTATION

The Site Manager/Supervisor shall conduct and encourage RCC employees and subcontractors to conduct toolbox meetings to address safety & environmental hazards in and around the site, community interactions & feedback, company alerts posted on Crookes net, Client raised environmental issues, safe work practices, coordination and responsibilities.

The Project Manager will advise relevant residents of the nature and scope of works.

7.3.3 COMMUNITY COMPLAINTS

Upon receiving a community complaint, site personnel are to complete Form 18.5 Community Feedback.

Remedial action must be taken as soon as practical Note it is an RCC objective to have all complaints actioned with 24hours. Any action taken must be recorded on the form.

The Site Manager/Supervisor is to include the completed Form 18.5 in the site files.

Richard Crookes Constructions undertakes to advise adjacent property owners/managers of the timing and duration of activities likely to give rise to environmental concerns e.g. ground works or proposed out of normal hours activities.

Where applicable a list of adjoining building managers with their business and out-of-hours contact numbers will be maintained on the project records together with notations of pertinent advices.

As per Baiada's Oakburn Environmental Operations Plan, nearby residents are to be consulted via call around, at a quarterly basis.

7.4 ENVIRONMENTAL COMPLAINTS

The Project Manager and/or the Quality & Environmental Coordinator will immediately investigate all environmental complaints. Details of complaints and the remedial action taken will be recorded in the project records.

Richard Crookes Constructions will notify Baiada of all applicable complaints received. Any complaints received by Baiada will be investigated and recorded by Richard Crookes Constructions as appropriate. Baiada must be notified verbally immediately after the complaint and furnished with a written report within 24 hours of the complaint.

The report should be drafted on Richard Crookes Construction Environmental Complaint and Incident Report Form 18.5

A record of all complaints will be kept using Richard Crookes Construction Project Complaint and Incident Register (C-FRM-094). Examples of the complaint report form and register can be viewed in Appendix E.

All complaints shall be responded to within 48 hours.

7.5 ENVIRONMENTAL INCIDENTS

7.5.1 INCIDENT MANAGEMENT AND REPORTING

Incident reporting and Investigation refer to procedure QAP-8.5-001

Definitions:

Class 1: Dangerous occurrence, or actual harm to an ecosystem, property loss or clean up exceeds $10,000 (as prescribed in 2.1.) Class 1 incidents and some cases Class 2 (as determined by senior management) will be investigated, as directed by BS Environmental Manager, WHS Head of Safety and/or where required initiate the RCC Business Continuity Plan

Form 03 0 Investigation Report will be completed by the BS Environmental Manager or Senior Safety Advisors and the original forwarded to the Project Manager and reviewed by the BS Environmental Manager WHS Head of Safety and reported to Senior management and Executives/Board.

Class 2: Major Leak, spill or escape off site of liquids, near miss/dangerous occurrence i.e. plant/equip damage, disruption to services. Note: Some Class 2 will be investigated at the discretion of the BSM / WHS Head of Safety

Class 3: Minor Leak, spill or escape off site of liquids all less than >10lts, Dust, Vibration

The Site Manager/Supervisor will ensure that all Class 2 and Class 3 incidents in or around the site, involving RCC personnel, subcontractors, visitors or passers-by, external authorities, Unions etc. are reported regardless of how minor they appear at the time of the occurrence.

7.5.2 DUTY TO NOTIFY ENVIRONMENT PROTECTION AUTHORITY (EPA) OF POLLUTION INCIDENT – NOTIFIABLE INCIDENT

Pollution Incident means an incident or set of circumstances during or because of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed on the premises, but it does not include an incident or set of circumstances involving only the emission of noise.

Incidents that require a (Duty to Notify) to the regulatory authorities EPA Pollution line (phone 131 555) under section 148 of the Protection of the Environmental Operations Act 1997 (POEO Act) are:

- If the actual or potential harm to the health or safety of human beings or ecosystems is not trivial,
- If actual or potential loss or property damage (including clean-up costs) associated with a pollution incident may exceed $10,000

For all Notifiable Incidents, the following activities should be undertaken:

- The incident site must not be disturbed until an inspector arrives at the scene or directs otherwise, this may include plant, substance, structure or thing associated with the incident. The person with management or control of the workplace is responsible for preserving the incident site, so far as reasonably practicable.
- The incident site will be preserved unless it prevents any action needed to:
  - To minimise the risk of further notifiable incident
  - To facilitate a EPA investigation

For Regulator "reportable incidents", the Supervisor will notify the Project Manager, Business Systems Environmental Manager and or WHS Head of Safety to seek advice, then immediately prepare the submission of Notification to the regulator.

Business Systems Environmental Manager and or WHS Head of Safety will confirm and organise legal representation to assist in the preparation of the reports and initiate the RCC Business Continuity Plan

In some contracts it is a requirement to notify the Client's Representative immediately e.g. GC21 Contracts and relevant DPIE SSD reportable incidents

Under the Act, Richard Crookes Constructions is classified an employee, contractor, or agent, who causes or becomes aware of a notifiable event, must notify the person who employs them or engaged them as a contractor or agent (i.e. the client representative) within 24 hours of becoming aware of the event.

The notice must contain sufficient details to provide notice of the event, its nature, and the circumstances in which it happened (for simplicity referred to as the details of the event). Richard Crookes Constructions must always keep a record of when and to whom they gave notice of a notifiable event.

If the client representative cannot be contacted, then Richard Crookes Constructions must give the ARA (usually the NSW EPA) written notice with details of the event no later than 24 hours after first becoming aware of the event. The client representative has a duty to give written notice with details of the event to the ARA no later than 24 hours after becoming aware of the event.

As soon as possible Richard Crookes Constructions must also either:

- Give written notice with details of the event to any combination of the occupiers or registered owners of affected land; or
- Give public notice of the details of the event.

In addition to the written notice, if a person becomes aware of a notifiable event, the person should immediately call the NSW EPA Environment Line on 131 555 and report the matter. Relevant legislative provisions under the POEO Act include:

- section 120: Prohibition of pollution of waters
- section 147: Meaning of material harm to the environment
- section 148: Pollution incidents causing or threatening material harm to the environment
- section 149: Manner and form of notification
- section 150: Relevant information to be given
- section 151: Incidents not required to be reported
- section 152: Offence for breaching duty to notify pollution incidents
- section 153: Incriminating information

7.6 INCIDENT DEBRIEF / CLOSURE

Where an investigation is undertaken and it is determined that an "incident debrief" is to be carried out using Form 04 0, the Incident debrief will be distributed to all relevant stakeholders and Senior / Executive Management.

Outcomes of Investigations / findings may initiate an internal Alert for distribution.

7.7 NON CONFORMANCE

In the event of breach in the requirements of the EMP, such as:

- Non compliance with the RCC/ subcontractors SWMS or other environmental procedures;
- Non complying activities noted during site inspections (high risk or potential for legal breach);
- Following concerns regarding potential breaches in environmental legislation raised by RCC, the client or other stakeholders such as local council , Dept of Planning or the EPA;
- Changes to the RCC system or subcontractors procedures, as a result of corrective or preventative action following and environmental incident, inspection or external audit.

Form 31.1 – Non Conformance Report or via Aconex will be completed and issued to the offending party.

Non Conformances will be registered in Form 31.2 Non Conformance Report Register or on soft copy.

A copy of the Non Conformance Notice will be forwarded to the Project Manager and the subcontractor, who will implement appropriate corrective action.

Additionally Contractors Notices or Main Contractor Notices may be issued in certain circumstances.

7.8 REPORTING

Baiada will be notified of applicable environmental incidents and complaints, as soon as possible thereafter, including notification of the proposed corrective action.

Project Reports submitted to Baiada will report on all applicable environmental matters including environmental incidents, non-conformances, complaints, performance and the implementation and effectiveness of the CEMP.

All communication of information concerning the project environmental performance, internally and externally, shall be in compliance with Richard Crookes Constructions 'Environmental Communication' procedure. Weekly environmental checklists (as shown in Appendix B) are to be undertaken by the Site Manager and the Richard Crookes Constructions site team. The reporting of these checklists is to be circulated to the team and Baiada.

Continual improvements are to be noted and communicated to the workforce in both pre-starts and site toolboxes daily and weekly respectively. Pre-starts will be undertaken daily to highlight the items that need

to be addressed with the site workforce every day such as dust suppression (i.e., watering roads to prevent excessive dust).

Environmental Audits are to be undertaken at a minimum every 4 months to review procedures and policies.

7.9 EMERGENCY RESPONSE PLAN

The response procedures, emergency contact numbers, responsibilities and required actions for responding to environmental emergencies have been integrated into the Project Emergency Plan.

EMERGENCY MANAHEMENT PROTOCOLS	
Objective	• The project manager shall ensure that: – A spill kit is always available on site – All reasonable measures are taken to prevent environmental emergencies – The project emergency plan is readily accessible to all site personnel – Emergency plans are part of site inductions
Reporting	• All emergency situations to be reported, investigated and recorded
In the event of an environmental incident	• Stop work and secure the area if safe to do so • Initiate the Project Crisis Checklist • Prevent the incident from escalating • Notify applicable management, emergency services and authorities • Clean up the affected area. Engage specialist help if required • Investigate the circumstances • Record the incident • Implement actions to prevent a recurrence • Follow-up to ensure the actions were correctly implemented and effective
Extreme Wet Weather	• Alert site personnel and stop all external work on if applicable • Check site for plant, equipment and materials on site and secure anything not in immediate use • Check water outlets, water catchments, stormwater and sedimentation controls
Unplanned Interruptions to Existing Services	• Shut down and isolate plant if safe to do so • Immediately notify relevant emergency services and service providers • Secure the area and erect hazard markers as required • Protect stormwater outlets, implement controls if required. • Do not recommence work until approved by the relevant authority
High Wind Warning	• Alert outdoor workers of potential dangers and stop all external work • Secure any loose object that could become missiles
Dangerous goods spill or leak	Event of spill: • Assess: evaluate the spill to determine if it can be dealt with by an individual, the spill response team or if outside assistance is required. • Secure: make the site safe for all personnel and the general public. • Contain: spill response equipment such as spill booms, drain covers or bunding can be used to contain the spill. for solids, tarps may be used to cover and prevent dampness to granules or possible dispersion by wind. • PPE: identify the liquid and check the MSDS to ascertain the required PPE. • Absorb: once the liquid is contained, it will need to be converted to a solid by absorption. use the appropriate absorbing pads or absorbent to soak up the spill by placing them over the Liquid. remove the saturated pads and replace as necessary. on porous surfaces, sprinkle loose absorbent over the spill and broom through until surface appears dry. • Dispose: place the spent absorbent in the disposal bags. correctly dispose of contaminants off site using a licensed contaminated waste disposal contractor. • Report: document the incident and include what happened, when it happened, where it happened; and what was done to eliminate or minimise the impact. • Restock: order and replace used up PPE and absorption materials.

7.10 STRATEGY FOR CONTINUAL IMPROVEMENT

Richard Crookes Constructions endeavours to continuously improve its approach to Environmental Management, and the environmental outcomes on the Baiada OPP Early Works project.

Richard Crookes Constructions employs the following measures to achieve its strategy for continual improvement:

- Risk assessment reviews & updates: the Project Environmental Risk Assessment is to be reviewed for effectiveness and updated at intervals of no more than 4 months.
- Weekly environmental inspections: At intervals of no more than 7 days, a sitewide Environmental Inspection will be carried out using the Form 18.3 (appendix B). This checklist requires recommendations for improvement to be made. Recommendations will then be implemented by site management.
- Internal Audit: Compliance with the CEMP will be internally audited at intervals of no more than 6 months. Recommendations arising from the audit will be implemented by site management.
- Training of site personnel: As detailed in section 7.11 below.

7.11 ENVIRONMENTAL TRAINING

As part of their site environmental induction/training all personnel engaged in the works shall be made aware of the provisions of this Construction Environmental Management Plan in order to promote a general awareness of the environment and to minimise any potential impact upon it.

Environmental induction and training will be appropriately commensurate with their roles and environmental responsibilities in the project.

Evidence of environmental induction and training of personnel for this project shall be maintained on the project records.

Subcontractors shall be responsible for providing evidence to Richard Crookes Constructions, as applicable, prior to commencing work that:

- Environmental training needs of their personnel working at the site been assessed and satisfied.
- Subcontractor personnel have received the appropriate environmental awareness training and / or qualification for the task to be undertaken.

Training requirements for Richard Crookes Constructions personnel are identified and planned on appointment to their role, and for each project. The Project Manager will monitor the skills required by Richard Crookes Constructions personnel and contractors to effectively implement the CEMP and its procedures on site. Any further training needs will be identified, implemented, and recorded in the project records.

7.12 AUDITING

The Site Manager and the Richard Crookes Constructions Safety and Environment Manager will conduct regular evaluations of the implementation and effectiveness of the CEMP.

In addition to the regular reviews, the Safety and Environmental Manager will conduct periodic environment audits including an audit of the implementation and effectiveness of this CEMP.

The audit will identify any deficiencies in the implementation and effectiveness of environmental management practices at the site. The Safety and Environment Manager will issue Non-conformance Reports (NCRs) or Corrective Action Requests (CARs) as applicable.

7.13 ENVIRONMENTAL NON-CONFORMANCES, CORRECTIVE AND PREVENTIVE ACTIONS

Richard Crookes Constructions will identify and evaluate all non-conformances with legal requirements; applicable permits; specifications and the requirements with this CEMP.

Non-conformance Reports shall be raised as appropriate to clearly identify the nature of the non-conformance and document the proposed remedial action and the person responsible.

The Site Manager will verify follow-up action is implemented and effective. Reports will be filed in the

project records. Corrective and Preventive Action Requests will be raised, where appropriate, as a result of complaints, incidents, non-conformances and deficiencies identified in the implementation of environmental practices and procedures. Corrective and Preventive Action Requests shall be raised, where appropriate, to correct and/or prevent non-conformances in construction activities and in the operation of the Environmental Management System.

Actions as a result of Corrective and Preventive Action requests will be implemented, followed-up and recorded in the Project records.

7.14 PROJECT ENVIRONMENTAL RECORDS

The following documents are to be retained in the project records:

- Weekly Environmental Inspection Reports
- Environmental Incident and Complaint Reports
- Environmental Non-conformance Reports
- Environmental Corrective and Preventive Action Requests
- Environmental Reports
- Copies of all applicable Environmental Permits
- Environmental Monitoring Records
- Environmental Induction and Training Records
- Environmental Audit Reports
- Project Environmental Aspects and Risk Assessment
- Any correspondence regarding environmental issues relating to the site.

7.15 ISSUE AND CONTROL OF THE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

The Controlled copy of this CEMP is located in the project's environmental folder on the common drive. All hard copies of this document are uncontrolled.

Copies of the CEMP shall be distributed electronically via Aconex to all Subcontractors. The distribution list shall be maintained within Aconex and is available from the Project Document Controller.

The CEMP is to be revised with any applicable changes to the environmental requirements for this project.

8 STANDARD ENVIRONMENTAL PROTOCOL (SEP) FOR IDENTIFIED ENVIRONMENTAL RISKS

The Project Team in conjunction with the Safety and Environment Manager have identified and addressed the environmental aspects associated with this project. This involves:

- Reviewing the environmental requirements of the Contract and Contract Specifications
- Reviewing all environmental consent conditions including permit and development consent conditions and pollution control approvals applicable to the project
- Reviewing the site conditions and proposed construction activities
- Reviewing the Richard Crookes Constructions Environmental Aspects Register
- Reviewing the Richard Crookes Constructions Register of Statutory and Environmental Reference Documents to identify applicable legal and other statutory requirements.
- Identifying for each activity, the environmental aspects and associated actual and potential environmental impacts and opportunities for normal and uncommon circumstances.
- Assessing the inherent and residual significance of each identified environmental risk and opportunity using the probability of occurrence of the impact and the severity of the impact.
- Documenting within this CEMP project specific action plans and control measures to manage each identified environmental aspect, risk and opportunity.

Environmental Standard Operating Procedures (SOPs) have been developed to manage each environmental aspect pertinent to this project, as identified in the Environmental Risk Assessment.

These SOPs document the objective, strategy, action plan, control measures and performance targets for each identified aspect. Each SOP is outlined separately under sub-headings in the page's hereafter.

Any complaints or incidents will be recorded in the complaints and incidents register as shown in Appendix E. Actions for rectification will be reviewed following an incident and rectified accordingly such that the incident can be closed out.

8.1 Site Accommodation	
Standard Environmental Protocol	
Objective	Control, minimise or avoid contamination or spoiling of areas in the establishment, operation and disestablishment of temporary site accommodation facilities.
Management Strategy	Establish temporary site offices, amenities and ablution facilities, including provision for sanitary waste, in accordance with the requirements of the relevant local authority, all relevant Acts and Regulations and industry best practice. Remove all temporary buildings and facilities from site when no longer needed and make good all disturbed areas, including landscaping where required.
Action	Project Manager shall ensure: • Site offices, amenities and ablution facilities are located and operated in such a manner as not to cause environmental concern • Site offices, hoarding, crossovers and fencing complies with the approved Site Plan or approved revision • Consider materials laydown area(s). Prioritise areas that will not have a deleterious effect on vegetation or stabilisation; this includes frequency of vehicle access • Spill kits should be nearby to materials laydown areas and plant access areas • Adequate firefighting equipment is provided and maintained for the works • Required permits and approvals are received prior to commencing works • Install automatic shut-off taps to water points and utilise low voltage luminaries to site facilities • No trees or vegetation is damaged or removed for site accommodation facilities. Adequate tree protection will be provided • Construction routes are cleaned regularly at weekly intervals or as required • Efficient use of energy needed for lighting, space and water heating, and equipment in the site facilities, including offices, cafeteria and washroom facilities, toilets and any other temporary accommodation and storage areas on site.
Performance Indicators	Appropriate location and operation of all facilities. Site reinstated upon completion of project
Reference	• Approved Site Plan • EPA's Interim Construction Noise Guideline (DECC, 2009) • State Significant Development Approval Conditions • Environmental Planning and Assessment Act 1979 (NSW) • Local Land Services Act 2013 (NSW) • Protection of the Environment Operations (Noise Control) Regulation 2008 (NSW)

8.2 Site Amenities	
Standard Environmental Protocol	
Objective	Maintain hygiene and reduce nuisance created by site accommodation.
Management Strategy	Keep site clean and tidy Monitor area
Action	Project Manager shall ensure that: **Ablution** • Septic waste issues from overflowing portable toilets and unaccounted sewerage pipe burst is avoided. • Adequate lavatory systems are provided within reasonable proximity of working areas • Septic waste removal service is scheduled • Toilet facilities are well maintained • Clean up procedures are included in induction • There is bunding around temporary septic systems • There is a suitable and adequate amount of signage • Site induction demonstrate proper site behaviour **Waste** • Paper waste from site office is collected in paper recycling bins and regularly collected. • Cardboard waste bin is provided on site. • All putrescible waste is stored in secure containers until removal and disposal off site. weekly • A daily 'sweep' of the entire area is done to remove any stray/windblown litter. • Designate specific areas on site for the temporary management of waste, i.e. general domestic waste, works waste and contaminated waste • Waste streams will be segregated to enhance recycling opportunities where practicable i.e. general domestic waste, works waste and contaminated waste • All domestic and industrial waste to be disposed of in dedicated industrial bins • Waste bin lids to be closed at all times to avoid, littering, access by birds and scavenging by vermin, birds or native wildlife • Waste oils to be recycled where practicable • No waste will be burnt on site.
Performance Indicators	No odour or vermin present

8.3 Air Quality (Including Dust)	
Standard Environmental Protocol	
Objective	Avoid, control or minimise contaminant emissions to the atmosphere caused by rising dust, vehicle/plant emissions, noxious fumes/odours, or paint spraying activities.
Management Strategy	Site environmental induction to address the issue of air quality and protective measures to prevent avoidable discharge of contaminant to the atmosphere Implement measures for control and suppression of dust
Action	Project Manager shall ensure: • Deposition over an averaging period not to exceed 4g/m2 /month. Visual observance of dust is low, 20km visibility is maintained • Work areas kept free of dust • Equipment to cut and grind concrete should be fitted with effective dust extractors • Cutting areas will be provided that are isolated dust extraction areas; all concrete cutting including blockwork and wall sheeting should be done in these areas • Concrete grinding should be supported an H-Class vacuum • Captured dust should be bagged and tied prior to dumping into general waste • All trades vacuum/sweep up as they go • Decks should be cleaned progressively including magnet extraction of reinforcement tailings and off-cuts to avoid a big deck blow-off prior to pouring and future-proof against strong winds • Materials deliveries such as fill, soil, sand, gravel, landscaping supplies etc, are transported to the site under covered loads • Stockpiles are stabilised with suitable materials • Site conditions are regularly inspected, and hand-held sprinklers and/or water cart are used as required to minimise dust • External paint spraying activities are undertaken in accordance with local authority requirements and not carried out during adverse weather conditions • All machinery and equipment used at the site will be maintained to relevant standards to reduce emissions to as low as possible • Disturbed areas will be re-vegetated as soon as practicable after construction of the works • Earth wetting using water cart and water sprays will be undertaken as required during construction • to minimise dust generation at the site • Roads will be cleaned regularly to prevent the spread of dirt on roads surrounding the site • On-site speed restrictions and the need to control dust are formally discussed during site inductions • During the construction phase screening will be used by Richard Crookes Constructions where necessary to prevent the spread of dust. This screening will also serve to screen the construction site from surrounding land uses and mitigate potential landscape impacts • Construction plant, machinery and vehicle access is to occur along designated access tracks only • Staff training and inductions, including: • Procedures for the application of dust suppression measures • General site management • Periodic toolbox training to be provided to relevant construction personnel to present new information or reiterate information relating to minimising potential impacts to air quality.
Performance Indicators	Visual observance of dusts levels; vehicle and plant emissions No dust complaints
Reporting	Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Reference	• Protection of the Environment Operations Act 1997 (NSW) • Protection of the Environment Operations (Clean Air) Regulation 2010 (NSW) • National Greenhouse and Energy Reporting Act 2007 (NGER Act) • National Environmental Protection Measure (NEPM) for Ambient Air Quality • Contaminated Land Management Act 1997 (NSW)

8.4 Noise	
Standard Environmental Protocol	
Objective	Control, minimise or avoid environmental nuisance caused by 'unreasonable' levels of noise.
Management Strategy	Site environmental induction to address the issue of noise and protective measures to prevent 'unreasonable' noise caused by construction activities.
Action	Project Manager shall ensure: • All construction activities will be undertaken mindful of the provisions of Australian Standard AS 2601-2001 The Demolition of Structures (Standards Australia, 2001). • Construction work must not be carried out in a way that makes an audible noise outside of the approved works hours of 7:00am to 6:00pm Monday to Friday, and 8:00am to 1:00pm Saturday. • Out of Hours Work – Richard Crookes Constructions will provide at least five days' notice to Baiada prior to requiring access to the Site out of the access hours. A minimum of two personnel must be present on Site when work is being conducted outside the access hours. • Each item of plant is fitted with effective noise suppression devices (generally exhaust mufflers) as applicable. • Fit mufflers/silencers to pneumatic tools (e.g. breakers) • Substitute impact piling for bored piling or hydraulic piling where possible. If impact piling is adopted, place a resilient pad (dolly) between the hammer head and the pile. Enclose the hammer head and the top of the pile in an acoustic screen. • All plant, equipment and machinery are operated and maintained in accordance with acceptable industry standards and turned off when not in use. • Two-way radios are used for site signalling and communication. • When construction work is permitted outside designated hours, notice is given to occupiers of properties within the immediate precinct of the works providing details of the work to be done, together with the hours to be worked. • Power generators used for after-hours lighting are positioned and acoustically treated, as far as practical, to minimise noise emissions. • Richard Crookes Constructions will notify Baiada a minimum of 48 hours in advance if any of the following activities are to be undertaken on Site and are likely to disturb occupants within the adjacent facilities: – Impact drilling concrete, floors or masonry – Chasing into walls – Use of explosive powered tools – Electric sawing of any material – Any noisy activity that may need to take place outside normal business hours.
Performance Indicators	No complaints concerning noise nuisance. No fines received.
Reporting	Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Reference	• Protection of the Environment Operations Act 1997 (NSW) • Protection of the Environment Operations (Noise Control) Regulation 2008 (NSW) • Contract Specifications • Australian Standard AS 2601-2001 The Demolition of Structures (Standards Australia, 2001).

8.5 Vibration	
Standard Environmental Protocol	
Objective	Control, minimise or avoid disturbance caused by vibration in ground works or other structural activities.
Management Strategy	Site environmental induction to address the issue of vibration and protective measures to prevent disturbance/incidents caused by vibration. Identify works likely to cause high vibration—communicate this to the Principal and to neighbours.
Action	Project Manager shall ensure: • Vibration is controlled in accordance with AS 2670.2. • A survey of properties in the immediate precinct of the site is undertaken and notes made, together with a photographic record of existing conditions • All equipment and machinery is operated and maintained in accordance with industry standards • Any blasting, rock breaking, drilling or piling activities are carried out under strictly controlled conditions • The use of heavy machinery in the proximity of retained buildings or other structures will be limited to absolutory essential activities and only upon approval by the site manager • Extra vigilance is to be exercised while using rock breaking equipment near structures, hoarding walls and underground services. Activity is to cease at the first sign of risk and a risk assessment is to be carried out and ratified by the Site management team prior to proceeding. • Richard Crookes Constructions will notify the Principal a minimum of 48 hours in advance if any of the following activities are to be undertaken on Site and are likely to disturb occupants within the adjacent facilities: – Piling – Compacting – Use of explosive powered tools – Electric sawing of any material – In-ground, consider pre-drilling options to mitigate vibration.
Performance Indicators	No disturbances/incidents or complaints.
Reporting	Monitoring records to be maintained during construction activities with potential to generate vibration Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Reference	• Protection of the Environment Operations Act 1997 • Assessing vibration: a technical guideline 2006 • AS 2670.2-1990 Evaluation of human exposure to whole-body vibration Continuous and shock-induced vibration in buildings (1 to 80 Hz) • BS6472 Guide to Evaluate Exposure to Vibration in Building (1Hz to 80Hz) • DIN4150 Part 3 Structural Vibration – Effects of vibration on structures

8.6 Water Quality	
Standard Environmental Protocol	
Objective	Maintain the health of any impacted nearby waterbodies.
Management Strategy	Site environmental induction to address: The issues concerned with the conservation of water usage in construction activities. The issue of water quality and protective measures to prevent avoidable discharge into, or contamination of, waterways or established drainage systems.
Action	Project Manager shall ensure: • Any water leaving the site must be compliant with the following discharge limits: • No more than 50mg/L Turbidity, or 50 NTU, after establishing correlation • pH must be between 6.5 and 8.5 • Dissolved Oxygen must be greater than 6 mg/L or 80% saturation level for a normal 24 hr period • Temperature of the receiving waters must not rise more than 2°C above seasonal mean temperature • No visible oils, films, litter, coarse material, cement or other chemicals can be present in discharge • Wet discharge must be managed. This includes designated areas for washing out of concrete trucks, concrete pumps, paint, masonry cutting, and plaster. • Use of water for wet trades' clean-up is minimal, self-contained and recycled where possible, or optionally not using any washdown at all. • Paint, solvents, oils etc. are correctly stored in bunded and contained area. • Stockpiles of bulk materials are located well clear of any waterway or drainage systems, protected by sediment fences, and covered by tarp, seed, mulch or chemical binder • Where available, a recycled water source will be used for dust suppression • Where water discharge compliance can't be achieved, contaminated wastewater is to be used as dust suppressant or collected by a licenced contractor to a licenced facility • Roadways can be swept, not washed down • Work in or around watercourses should be managed to minimise impact in accordance with Richard Crookes Constructions plan
Performance Indicators	No incidents of inadvertent waste of water No pollution or contamination of waterways
Reporting	Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Applicable permits	Trade Waste Approval – "Special Approval"
Reference	• Managing Urban Stormwater: Soils and Construction. Volume 1, 4th Edition. Blue Book. • NSW EPA Approved Methods for the Sampling and Analysis of Water Pollutants in NSW • Protection of the Environment Operations Act 1997 (NSW), Section 120 • Standard Methods for the Examination of Water and Wastewater, 20th Edition. American Public Health Association. • Water Management Act 2000 (NSW) and Amendment Act 2010 • Water NSW Act 2014 • Water Management (General) Regulation 2011 (NSW) • Australian and New Zealand Guidelines For Fresh and Marine Water Quality 2000 • Australian Guidelines for Water Quality Monitoring and Reporting 2000

8.7 Erosion and Sediment Control	
Standard Environmental Protocol	
Objective	Avoid, or minimise and control, contamination caused by sedimentation run-off or the discharge of pollutants into waterways or established drainage systems. Conserve the use of water to minimal requirements.
Management Strategy	Site environmental induction to address: The issue of water quality and protective measures to prevent avoidable discharge into, or contamination of, waterways or established drainage systems The site-specific Erosion and Sedimentation and Control Plans are to be implemented and maintained.
Action	Project Manager shall ensure: • Any water leaving the site must be compliant with the following discharge limits: • No more than 50mg/L Turbidity, or 50 NTU, after establishing correlation • Erosion and Sediment Control to be established in accordance with the site Erosion and Sediment Control plans • Sediment fences are to be dug into the ground 200mm, using a bidim A34 product • Vehicle entry/exits will be established with shake-down grids, rumble rock and/or bunds, where required. • Any batters that are to remain are promptly and appropriately treated/revegetated • Earth bunds, swales/ channels or sediment fencing should be set up around the perimeter of the site so as to minimally disturb the natural overland flow of the surrounding watercourse and provide minimal run-off into nearby waterways that are diverted through the site • Sediment basins established in accordance with Sediment and Erosion Control Plans • Areas for plant and construction material storage are designated • Upstream stormwater runoff is diverted around disturbed areas of the site • Disturbed areas are stabilised as soon as practicable • Stormwater quality discharging from the site is monitored, and the implement additional measures or modify existing measures if required • Transport routes are designated and marked of across the site to minimise dust disturbance • Drainage structure protection devices are installed to existing stormwater inlet structures within the site, and within the road ways adjacent to the site. • Site personnel are educated to the sediment and erosion control measures implemented on site • Where available, a recycled water source will be used for dust suppression
Performance Indicators	No sedimentation run-off No pollution or contamination of waterways.
Reporting	Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Reference	• Protection of the Environment Operations Act 1997 • Soil and Construction, Volume 1, 4th Edition, March 2004 (Managing Urban Stormwater, Landcom) • EPA, A Resource guide for local councils: Erosion and sediment control, 2006 • AS/NZS 5667.1:1998 Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples

8.8 Spill Response Management	
Standard Environmental Protocol	
Objective	Control, minimise or avoid spillage of hazardous or prohibited substances, and react quickly to contain spills in the event they occur.
Management Strategy	Induct all personnel to handle chemicals with care. Ensure spill kits are positioned near potential escape points.
Action	In event of spill: • Assess: Evaluate the spill to determine if it can be dealt with by an individual, the spill response team or if outside assistance is required i.e.; hazchem, police, fire brigade, specialist spill response company. • Secure: Make the site safe for all personnel and the general public. • Contain: Spill response equipment such as spill booms, drain covers or bunding can be used to contain the spill. For solids, tarps may be used to cover and prevent dampness to granules or possible dispersion by wind. • PPE: Identify the liquid and check the MSDS to ascertain the required PPE • Absorb: Once the liquid is contained, it will need to be converted to a solid by absorption. Use the appropriate absorbing pads or absorbent (according to the type of material spilled) to soak up the spill by placing them over the liquid. Remove the saturated pads and replace as necessary. On porous surfaces, sprinkle loose absorbent over the spill and broom through until surface appears dry. • Dispose: Place the spent absorbent in the disposal bags. Correctly dispose of contaminants off site using a licensed contaminated waste disposal contractor. • Report: Document the incident and include what happened, when it happened, where it happened; and what was done to eliminate or minimise the impact. • Restock: Order and replace used up PPE and absorption materials. Project Manager shall ensure: • Spill containment and treatment equipment and materials will be available near storage areas of hazardous materials and escape points of the site. Spill kits and other suitable incident response equipment will also be located at other key points around the site and maintained ready for use. • Transport of chemicals is planned and controlled to minimise change of spillage. Transport is only to occur in a bunded and secure vehicle, with checks in place to ensure container lids are secure. • Subcontractors will be required to provide and maintain their own spill kits where required. • Spills of hazardous materials will be collected by licensed contractor and collected for treatment at a licensed waste disposal facility. • All regulated waste will be tracked as per the Environmental Protection (Waste) Policy 2000 • Contaminated ground is made good and contaminated material that is to be removed from site is disposed of in an approved manner. • SWMS must be submitted and approved for the handling and use of hazardous chemicals. • Any waste oils, lubricants and contaminated cloths, resulting from maintenance of plant on-site, are placed in suitable containers prior to removal and disposal at an approved waste receiving facility.
Performance Indicators	No spillages. Spill kits readily accessible.
Reporting	Immediate contact and incident reporting through Environmental Manager in event of spill. Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Reference	• Work Health and Safety Regulation 2011 s357 • Protection of the Environment Operations Act 1997 • Protection of the Environment Operations (Waste) Regulation 2014 • EPA Waste Classification Guidelines 2014 • Environmental Protection Act 1994, s 443, s 11, s 15-17

8.9 Protection of Flora	
Standard Environmental Protocol	
Objective	To preserve and protect native vegetation and forestry areas from injury or harm as a consequence of construction activities and as far as practical, minimise disturbance to animal habitats.
Management Strategy	Site environmental induction to address issues of potential harm to native flora. Confine site clearance to minimum requirements. Apply appropriate controls for noise abatement and dust control to minimise disturbance. Register contact telephone numbers for NSW National Parks and Wildlife Service on project records.
Action	Project Manager shall ensure: • Any tree protection or removal is to be carried out under the management plan produced by an Arborist • If trees to be removed are in a wildlife corridor, a qualified specialist should inspect for wildlife or animal habitats. Arborists, Spotter/Catchers, or Ecologists (holding a current Rehabilitation Permit licensed under the Nature Conservation Act 1992) are qualified to undertake this inspection • All vegetation to be removed shall be marked and inspected on-site by the Superintendent prior to clearing. Removal shall be supervised by a qualified Arborist • All vegetation to remain will be protected with hoarding or barriers • Trees approved for removal are grubbed out, segregated for salvaging of timber or mulched for use as green waste • All rectification to retained trees is carried out by an approved Arborist • Protective fencing and Tree Protection Zones are established as required for all retained trees • Appropriate controls and monitoring are maintained for Tree Protection Zones • No deleterious materials are stored within the drip line of trees, including stockpiling of organic material that chokes the trunk • All incidents of injury or displacement of native fauna is reported to the Superintendent • No damage is incurred to Local Council property without first obtaining a permit.
Performance Indicators	No harm or damage to vegetation.
Reporting	Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Applicable Permits	All native vegetation, Significant Native Vegetation (SNV) and Waterway and Wetland Vegetation (WWV) requires a permit to clear, under the Natural Asset Local Law 2003 Clearing Permits for removal of Protected Plants may be required if triggered under the Nature Conservation (Protected Plants) Conservation Plan Approval is required under the Vegetation Management Act when clearing is to be undertaken within a declared area or within a remnant ecosystem, unless listed under the exemptions in the Sustainable Planning Regulation 2009
Reference	• Biodiversity Conservation Act 2016 No 63 • Local Land Services Act 2013

8.10 Protection of Fauna	
Standard Environmental Protocol	
Objective	To preserve and protect native wildlife from injury or harm as a consequence of construction activities and as far as practical, minimise disturbance to animal habitats.
Management Strategy	Site environmental induction to address issues of potential harm to native flora. Confine site clearance to minimum requirements. Apply appropriate controls for noise abatement and dust control to minimise disturbance. Register contact telephone numbers for NSW National Parks and Wildlife Service on project records.
Action	Project Manager shall ensure: • During removal of any trees, or clearing of vegetated areas, a qualified specialist should inspect for wildlife or animal habitats. Arborists, Spotter/Catchers, or Ecologists (holding a current Rehabilitation Permit licensed under the Nature Conservation Act 1992) may be qualified to undertake this inspection. During the clearing works, the Spotter/Catcher must conduct a daily pre-clearance inspection and supervise progressive clearing. Sustainable zones near the site should be determined for suitability for relocation and mitigation strategies. Appropriate green zones within a radius of the site must be established. The fauna management programme must be aimed at maximising relocation effort with intent to minimise any fauna stress. • If a Koala is observed in trees close to the works, works should cease. Koalas cannot be relocated but must be allowed to move of their own accord - with clearing being managed in an appropriate manner to facilitate this. • In the event wildlife is found, either by fauna inspection or in the course of normal works, cease work immediately and wait for the animal to move on. Wildlife includes reptiles but does not include insects. • Subcontractors should notify Richard Crookes Constructions if wildlife is at risk from the works and seek advice before continuing. Wildlife will either move away of its own volition, or it may need to be relocated by a licenced Spotter/Catcher. • A qualified fauna spotter must be present to observe all native tree trimming or clearing to ensure that wildlife is not injured. • If trenches are left exposed around habitats, ladders or steps are required to enable escape. If you find a sick or injured wild animal, contact your nearest veterinarian or wildlife carer organisation as soon as possible so that it may receive appropriate treatment. Wild animals become stressed by handling, so you should seek expert advice before handling an injured animal. Try to minimise the amount of exposure the injured animal has to people and loud noises. Keep them warm and calm, only if practical to do so. Incorrect handling of an injured animal can result in increased stress to the species and pose risks to the personnel. Do not attempt to feed or treat it unless you have specialist knowledge or training. Contact details for injured wildlife are: RSPCA Animal Ambulance: 1300 ANIMAL (1300 264 625)WIRES (NSW Wildlife Information Rescue and Education Service): (1300 094 737)
Performance Indicators	No harm or damage to native fauna.
Reporting	Immediate contact and incident reporting through Environmental Manager in event of contact with fauna in path of works Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Applicable Permits	Spotter/Catcher permit required to move wildlife in from the path of works Essential Habitats for the Koala require a permit to demolish, and usually also offsets.
Reference	• National Parks and Wildlife Act 1974 • Biodiversity Conservation Act 2016 No 63

8.11 Weed Control	
Standard Environmental Protocol	
Objective	To detect and manage identified weeds and pests.
Management Strategy	Monitor site for weeds and pests
Action	Project Manager shall ensure: • An herbicide treatment strategy should be approved with the Landscape Architect if weed treatment is required. This is to ensure the planting is not affected by the weed treatment • A company with demonstrated weed management credentials would need to be engaged to provide advice on control methods and the application of herbicide if appropriate • Sweeps should be done on a week basis before, during and after works, particularly during hydromulching of ground for "on-maintenance" handover • Ensure all imported fill is certified clean • All excavated spoil leaving site should be inspected for deleterious organic material • Methods for disposal include deep burying, mulching or putting the weeds in a plastic bag and leaving in bright sunlight until they are dead • Establish a vehicle washdown bay that includes: • Swale from washdown platform • Sump pit lined with visqueen • Line banks of sump pit with gabion rock
Performance Indicators	No spread or release of weeds
Reporting	REO immediately notified of any discovery Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Applicable Permits	It is illegal to possess, sell or release weed or pest species without a permit
Reference	• Biosecurity Act 2015 • Biosecurity Regulation 2017

8.12 Land Contamination	
Standard Environmental Protocol	
Objective	To detect and manage contaminated land, prevent leaching of contaminated materials or groundwater infiltration during earthworks, and detect services prior to commencement. Avoid or minimise contamination of land caused by the use of imported materials, or by spillage of fuels, paint, form oil, chemicals etc.
Management Strategy	• Expert Consultants are engaged to provide a detailed assessment of the quality of the earth before earthworks begin • Services will be identified before earthworks commences • Controls are in place to capture and treat tainted water and earth.
Action	Project Manager shall ensure: • Soil contamination risk for the site will be discussed in Section 3 of this Environmental Plan • Unexpected contamination may present itself during earthworks. Signs include pockets of discoloured or poorly textured soil (noticeable different from the surrounding soil); and malodours that present (e.g. oil, sulphur, chlorine, sewerage).
Performance Indicators	No release of contaminated materials or compromised water from the site.
Reporting	Immediate liaison with the Environmental Manager in event of unexpected contamination finds Incident reporting in event of release or discovery of contamination
Applicable Permits	Permits for removal and disposal of contaminated soil
Reference	• Protection of the Environment Operations Act 1997 • Protection of the Environment Operations (Waste) Regulation 2014 • EPA Waste Classification Guidelines 2014 • Contaminated Land Management Act 1997 • Contaminated Land Management Regulation 2013 • EPA Contaminated Sites: Guidelines on Significant Risk of Harm from Contamination & the Duty to Report 1999 • Assessment of Site Contamination NEPM 1999 • EPA Contaminated Sites: Guidelines for Assessing Service Station Sites 1994 • EPA Contaminated Sites Guidelines for the NSW Site Auditor Scheme (2nd edition) 2006 • EPA Guidelines for the Assessment and Management of Groundwater Contamination 2007 • EPA Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites 1997 • EPA Contaminated Sites: Sampling Design Guidelines 1995 • AS/NZS 5667.11:1998 Water quality – Sampling – Guidance on sampling of groundwaters

8.13 Protection of Cultural, Heritage and Aboriginal Artefacts	
Standard Environmental Protocol	
Objective	Avoid damage or disturbance to archaeological/cultural artefacts including skeletal remains, shell middens or other cultural artefacts.
Management Strategy	Conduct a historical investigation of the site to establish, as far as practical, the likelihood of existence of archaeological/cultural artefacts. Site environmental induction to address likelihood of discovery of archaeological/cultural artefacts. Excavation personnel to remain vigilant over ground penetration points.
Action	Project Manager shall ensure: • Where archaeological/cultural artefacts are discovered, personnel cease work in the subject area and effect practical protection measures • Baiada is promptly advised of significant discoveries • Directions from Baiada are followed • If suspected human remains are discovered that work is ceased and the Superintendent, Police and State Coroner's Office are contacted, and if applicable, the Department of Aboriginal Affairs. • If any item or object of Aboriginal heritage significance is identified on site, Heritage NSW must be contacted immediately.
Performance Indicators	No damage, or minimal disturbance, to any archaeological/cultural artefacts discovered.
Reporting	Superintendent is immediately notified of any discovery Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Reference	• Heritage Act 1977 • Aboriginal and Torres Strait Islander Heritage Protection Act 1984 • Aboriginal and Torres Strait Islander Heritage Protection Regulations 1984 • Australian Heritage Council Act 2003 • Part 6 of the National Parks and Wildlife Act 1974

8.14 Fire Protection	
Standard Environmental Protocol	
Objective	Prevent the ignition and spread of fire.
Management Strategy	Areas prone to fire will be assessed. Site inductions will address fire risk minimisation controls.
Action	Project Manager shall ensure: • During construction, fire extinguishers will be located as per AS-2444 • Site rules and Inductions include prohibition of smoking and lighters • Combustible materials shall be stored in cool, dry locations, protected from weather • Weekly inspections to monitor build-up of flammable organic materials which may present a fire path, e.g. understorey fuels such as loose bark, fallen leaves and branches, and spear grass • Grass may need to be mowed and organic materials collected and disposed of or burned in a controlled manner • In extreme situations, fire breaks may need to be rutted out around the perimeter of the site • Fire control advantages should be identified, such as fire trails, water supply points, dams, and helipads
Performance Indicators	No fires, minimisation of fire-spreading paths.
Reporting	Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form.
Applicable Permits	A bushfire management plan is required in areas of high bushfire risk as per the risk overlay mapping.
Reference	• AS-2444-2001 Portable fire extinguishers and fire blankets - Selection and location

8.15 Identification and Protection of Existing Utility Services	
Standard Environmental Protocol	
Objective	Avoid damage to, or unplanned interruption of, utility services, including those used by the existing Baiada Oakburn Rendering Plant
Management Strategy	Site environmental induction to address location of and protective measures for utility services. Identify, mark and protect utility services (electricity, water, gas etc.). Ensure all necessary interruptions to utility services are planned and communicated to all relevant persons and Authorities.
Action	Project Manager shall ensure: • Existing services plans will be studied and services will be located and marked prior to commencing any works • Services locations must be known prior to commencing earthworks • Vacuum excavation/Services Detection will be undertaken wherever services are likely to be encountered • Contact telephone numbers for emergency services for utilities are established and readily available in the Site Emergency Plan • Storage areas are located remote from utility services • Access ways, haul roads and turning points are arranged to avoid possible clashes with utility services • Overhead protection/warning is provided for high loads, vehicles, cranes etc • Spotters are provided when work is undertaken beneath overhead power lines • Where it is found necessary to temporarily interrupt, remove, divert or make connection to an existing service or other existing work beyond the control of the Richard Crookes Constructions, written approval from Baiada will be sought prior to undertaking Works
Performance Indicators	No unplanned interruptions to any utility service.
Reporting	Notification to relevant authorities Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Applicable Permits	Dial Before You Dig Permit to Dig (Richard Crookes Constructions Hammertech form)
Reference	• Work Health and Safety Act 2011 • Energy and Utilities Administration Act 1987 (NSW)

8.16 Waste Management	
Standard Environmental Protocol	
Objective	To control the disposal of waste generated from construction activities.
Management Strategy	Site environmental induction to address the issue of waste management and protective measures to prevent environmental incidents caused by inappropriate methods of disposal of waste. Designated bin store locations (for Wheelie bins & skips), and appropriate regime for clearance.
Action	Project Manager shall ensure: • All construction waste shall be taken off site and appropriately disposed of in accordance with all relevant State/Territory regulations during or at the completion of construction. • A Waste Management Plan is developed and implemented maximise the volume of waste demolition and construction waste that is reused or recycled during the project. This shall include an assessment of alternative construction waste minimisation strategies shall be undertaken and implemented as appropriate. These alternatives could include but not be limited to initiatives such as supplier take-back of packaging and off-cuts, pre-manufacturing or on-site waste grinding to produce construction materials (e.g. grinding of bricks/concrete/wood to make aggregate and woodchips), or "Ship to point of use" techniques to minimise protective wrappings or enclosures. • All topsoil affected by the construction works shall be separated and protected from degradation, erosion or mixing with fill, contamination or waste. • The MSDS of Chemicals and Hazardous Substances should be consulted before disposal instructions, which will usually involve dropping of containers to Chemical Waste/Hazardous Collection stations. Containers must not be washed out and disposed of as normal. • All PVC products shall be recycled and/or reused when being disposed, when not available, disposed of at a licensed landfill facility. • Waste is minimised through the use of careful measurement and conservative ordering to prevent oversupply of materials. • All waste will be sorted (including that from clearing, demolition, off cuts, etc.) into appropriate categories for recycling or disposal. • Richard Crookes Constructions will ensure that appropriate recycling receptacles are provided for scrap steel. • A recycling bin will be provided separately to the bin for Construction waste material and general waste (food scraps, cans, etc). Recyclable materials will include cardboard, glass, and plastics. • Any mulch accrued as a result of tree clearing can be used as erosion stabilisation. • Waste skips/bins are easily accessible and protected from weather dispersal. • Paper recycling bins are to be maintained in the office. Used toner cartridges should be collected and deposited at head office. • The construction site is kept free from build-up of waste materials by directing regular clean-ups by subcontractors. • No burning of waste takes place on-site. • Paint washouts will be provided and when full will be taken off-site to be filtered before discharging. • Any liquid waste, including backwash of wet trades, should be treated for adequate water quality before discharge, or collected by a liquid waste contractor.
Performance Indicators	No incidents arising from the disposal of end waste.
Reporting	Weekly Inspections undertaken and recorded on the Weekly Environment Inspection.
Reference	• NEPM (Movement of Controlled Waste between States and Territories) • Protection of the Environment Operations (Waste) Regulation 2014 • Waste Avoidance and Resource Recovery Act 2001 • EPA Waste Classification Guidelines 2014 • Construction and Demolition Waste Guide - Recycling and Reuse across the Supply Chain • National Waste Policy: less waste, more resources 2009 • National Packaging Covenant Work • AS 1940 – 2004: The Storage and Handling of Flammable and Combustible Liquids and the chemical's Safety Data Sheet (SDS)

8.17 Artificial lighting	
Standard Environmental Protocol	
Objective	Control or minimise disturbance caused by after-hours lighting.
Management Strategy	Site environmental induction to address the issue of after-hours lighting. Ensure all necessary after-hours work is planned and communicated to all relevant persons and authorities. As far as possible, plan all construction activities for normal daytime work.
Action	Project Manager shall ensure: • Minimising lighting pollution impact from external lighting provided during construction on neighbouring properties and their occupants and neighbouring ecological areas (external to the construction site), in accordance with Australian Standard "4282 Control of the obtrusive effects of outdoor lighting". • Directional lighting and type of lights used will be planned and designed with the above in mind; • Shining downwards and only where required. • Reduced by screening • Effective programming of work • Any lighting must be positioned to ensure light pollution does not enter the wildlife corridors. • All lighting equipment is installed in such a manner as not to cause a safety hazard to pedestrian or vehicular traffic within the immediate surrounds of the site. • Where required or deemed necessary, advisory/warning signs are posted in appropriate locations. • Relevant authorities are notified; approvals obtained and put into effect; adjoining property owners/occupiers are advised of when planned after hours lighting will occur.
Performance Indicators	No incidents or complaints.
Reporting	Monitoring records to be maintained for the duration of after-hours lighting. Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form.
Reference	• Protection of the Environment Operations Act 1997

8.18 Vehicular and Pedestrian Traffic Management	
Standard Environmental Protocol	
Objective	Avoid interference of, or obstruction to, roadways, footways or access points by the use of appropriate traffic control measures.
Management Strategy	Site environmental induction to address the issues of access and delivery arrangements for materials including timing and unloading of materials. Coordinate construction programme and delivery times to avoid hold-ups and traffic congestion. Provide appropriate fencing/hoardings and protection for the public.
Access	Access to the site will be determined to minimise impact.
Action	Project Manager shall ensure: • Controls documented in the approved Construction Traffic Management Plan are implemented • Vehicle entry/exits with shakedown grids will be established to remove the potential for vehicles departing the site to deposit debris on the roads. Richard Crookes Constructions will deploy street sweepers as required • Site fencing/hoarding is properly secured and lockable; access points are clearly designated and appropriate signage erected • Materials set-down areas are established. • All required Approvals are obtained and Traffic Controllers are engaged where necessary when temporary road closures are required. • Traffic management controls are monitored • Construction programme and delivery times are coordinated to avoid delays and possible traffic congestion • Access points for each stage of construction are unobstructed to facilitate prompt service to set–down areas within the site • Materials handling is managed to cause least disruption to traffic and local amenity.
Performance Indicators	Reports or complaints of interruption or interference with pedestrian or vehicular traffic movement around the site.
Reporting	Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Applicable Permits	Road Corridor Permit Traffic Control Permit
Reference	• Public Health Act 2010 (NSW) • Road Transport Act 2013 (NSW) • Road Transport (General) Regulation 2013 (NSW) • Roads Act 1993 (NSW)

8.19 Acid Sulfate Soil	
Standard Environmental Protocol	
Objective	To avoid significant impact caused by the disturbance of Acid Sulfate Soils (ASS).
Management Strategy	A soil investigation and analysis will be conducted to determine the extent of ASS on-site. Site environmental induction to address management of ASS. Excavations will be confined to minimum requirements. Bunds around all disturbed areas of ASS will be provided.
Action	Initial approach and planning A soil investigation and analysis will be conducted to determine the extent of ASS on site, including the possible and potential acid sulfate soils, and at what depths. An Acid Sulfate Soils Management Plan will be produced to outline the risks and liming rates to inform the earthworks contractors. Field Indicators • Field indicators for Actual Acid Sulfate include: • Water of pH <5.5 in groundwater or adjacent streams, drains, groundwater or ponding on the surface • Unusually clear or milky blue-green drain water within or flowing from the area (aluminium released by the acid sulfate soils acts as a flocculating agent) • Extensive iron stains on any drain or pond surfaces, iron-stained water or ochre deposits • Any jarositic (jarosite is a pale-yellow mineral deposit which can precipitate as pore fillings and coatings on fissures) horizons or iron oxide mottling in auger holes or recently dug surfaces. • With a fluctuating water table, jarosite may be found along cracks and root channels in the soil — however, jarosite is not always found in actual acid sulfate soils • Jarosite present in surface encrustations or in any material dredged or excavated and left exposed • Corrosion of concrete and/or steel structures • Dominance of mangroves, reeds, rushes and other swamp-tolerant vegetation – including estuarine occurrences of swamp trees • Field indicators for Potential Acid Sulfate include: • Typically waterlogged, soft muds (soft, buttery texture) or estuarine silty sands • Mid to dark grey to dark greenish-grey coloured soils or sediments • Offensive odour, predominantly due to 'rotten egg gas' (H2S). Screening process • Soils are usually "screened" to isolate areas of interest to test for. pHF and pHFOX indicate possible actual acid sulfate soils (AASS) or potential acid sulfate soils (PASS). • pHF — measure of soil pH of a soil:water paste. pHF <4 indicates oxidation has occurred in the past and that AASS is present. • pHFOX — measure of soil pH after rapid oxidation with hydrogen peroxide (H2O2). pHFOX <3, plus a pHFOX reading at least one pH unit below pHF, plus a strong reaction with peroxide, strongly indicates the presence of PASS. • Effervescence (or reaction rate) — a visual measure of the vigorousness of the oxidation reaction where: 1 = slight; 2 = moderate; 3 = high; and 4 = extreme. Assessment Process • Lab tests are the only truly definitive way of measuring for actual or potential acid sulfate. This is done by the SPOCAS or Chromium Suite method. • The SPOCAS suite is effective for coarser textured sediments. • The Chromium Suite (aka SCR suite) is effective for assessing soils with lower percentages of sulfide and for soils containing organic material. • Chromium reducible sulphur values (SCR) greater than 0.01% S indicate a significant level of sulphides, and where greater than 0.03% S then the soil has a high potential acidity level and an Acid Sulfate Soils Management Plan will be required. • Net Acidity (TAA + SCR + SNAS – ANC/1.5) of greater than or equal to 0.03% S for soils, for greater than 1000 tonnes of disturbance. Preparing a neutralisation zone/liming pad

- Prepare a liming pad/stockpile site of appropriate area for the volume of soil to be treated. The pad should be prepared on relatively level or gently sloping ground to minimise the risk of any potential instability issues, with a natural (or shaped) fall to the local drainage sump.
- Where the subgrade soils are other than low permeability clays, the surface of the pad should be lined with selected approved compacted clay (at least two layers to a combined compacted thickness of 0.5m) or a geosynthetic liner. Where the subgrade soils comprise low permeability clay, no clay or geosynthetic lining will be required.
- A guard layer of 'ag lime' should be applied over the clay subgrade or compacted clay liner, to neutralise downward seepage.. The guard layer of lime should be applied at a rate of approximately 5kg lime per square metre of surface area for every 1 m height of stockpiled soil.
- Liming pads should be bunded off, and a circumference drain excavated to collect and localise leachate. The drain and inner bund slopes should be covered with a layer of fine lime applied to neutralise any possible leachate migrating from the stockpiled material.

Neutralisation Process

- Supervision by a Scientist is not considered mandatory.
- Soil neutralisation can only be validated by lab tests (SPOCAS or Chromium suite).
- Aglime is the mandatory treatment material. Using aglime, overliming isn't an issue—it's not ecologically harmful as it only has neutralising properties on exposure to acid. In water it has low solubility (because water is neutral).
- Indicative liming rates can be applied before arranging lab tests, so lab tests are only done on the verification stage—rather than both the initial and verification stages.
- The excavated soil should then be spread onto the guard layer in layers of no greater than 200mm thickness, leaving a 1m flat area between the toe of the spread soil and the containment bund or drain. When spreading the first soil layer, care should be taken not to churn up the lime guard layer.
- It should be noted that saturated soil cannot be neutralised effectively with lime, particularly where it is cohesive (ie. comprises a majority of silt/clay sized particles). This is because the lime must be well mixed into the soil and this cannot be performed when the soil is overly wet and 'sticky'. Hence, the excavated soil must be dried back on a limed pad, before effective mixing can take place with earthmoving machinery. This is to enable the collection and separate treatment of any acid leachate formed during the soil drying and liming process. Wet weather will thus have a potential to delay the lime treatment process.
- Apply 'ag lime' to the stockpiled soil at the indicative liming rate given above over each spread layer and mix through with a harrow prior to spreading the next layer.
- ASS testing should be carried out on each layer to verify the lime dosing rates to be applied. This would confirm ASS soils have been neutralised and allow identification of problem material.
- Continue the spreading/liming/mixing cycle till excavation is finished.
- When testing indicates that lime neutralisation is complete, then the stockpiled soil may be removed from the liming/neutralisation pad.
- Verification testing of the soil is required to be conducted after the addition of lime to test whether or not mixing has been adequate, and to reduce the risk of acidic water being returned to other watercourses. The soil and water contained within the treatment bunds should not be removed until the target values have been achieved.
- Validation samples of soil should be collected and tested at a frequency of approximately one per 500m3 of treated soil. Similarly, additional layers of soil should not be added to the bunded stockpile for treatment until the underlying layers have been validated.

Water Run-off

- All water draining from the soil, once it is removed from the excavation, should be considered as potentially acidic and should be separated in a controlled area, such as the above referred bunded and lined pad, and not be allowed to flow back into waterways or stormwater until it has been tested for pH and for any other environmental tests required by the appropriate regulatory authority.
- Liming pads should be bunded off, and a circumference drain excavated to collect and localise
- leachate. The drain and inner bund slopes should be covered with a layer of fine lime applied to

	• neutralise any possible leachate migrating from the stockpiled material. • The pH of all ponded drainage water around the confines of the treatment bunds should be measured daily.Soil Testing and Verification • Soil sampling for verification (and assessment) will be as soon as practically possible within 66 hours (i.e.3 nights). Large shells (>2 mm), fragments of wood, charcoal and stones will be noted before being removed from the samples in the field. Biological remnants such as small roots will not be removed from the soil sample as they may contain sulfides: • Divide the treatment pad area into areas containing a volume of soil equivalent to the nominated verification testing rate (e.g. for a treatment pad holding 2000m3 and a test rate of 1 per 1000m3, divide the pad into two sections). A treatment pad holding 500m3 at a test rate of 1 per 1000m3 is considered as 'one' treatment area/section. • Within each area, use a randomised procedure to nominate at least six random sampling locations. • Within each area, use a consistent-volume sampler to gather subsamples of treated soil from each of the pre-defined locations on the treatment pad (at least 4 x 250g subsamples). Subsamples should extend through the total depth of the treated material but avoid sampling the underlying guard layer. • Composite the subsamples thoroughly together in a container with a secure lid (e.g. clean plastic 5L plastic pail). • Subsample approximately 400g of the composited material and submit it for analysis. • Leave the soil on the treatment pad until the results are available. • Samples will be collected in laboratory supplied acid sulfate soil bags, stored on ice in a cool box and submitted to a laboratory (with chain of custody documentation) that is accredited by the National Association of Testing Authorities (NATA) for acid sulfate soil analysis. Visual and olfactory monitoring of the surrounding receiving environment to identify and report any potential concerns or impacts as a result of the activities conducted within the Acid Sulfate Soil Treatment Area. Off-Site Treatment • The following excavation procedures will be adopted during works onsite: • All excavations below the upper ASS horizon shall be programmed to ensure that the period of open excavation is kept to a minimum; • Any exposed walls of excavations shall be treated by "dusting" with fine agricultural lime prior to backfilling; • Where provisions have been made, all ASS material is to be immediately placed onto trucks and transported to a licenced treatment facility; • Where the immediate transfer to trucks is not feasible, on-site storage of untreated ASS is not permitted for more than 18 hours for sandy material, and 70 hours for peat or clays. • In the event temporary stockpiling of soils is required, the soils should be placed on bunded limestone pad approximately 300mm thick, in a location up gradient of the development area to prevent potential leaching or run off into undisturbed areas.
Performance Indicators	No acid discharge from site. Satisfactory laboratory results of tests on stockpiled ASS.
Reporting	Daily monitoring reflected in daily site diary entries Weekly Inspections undertaken and recorded on the Weekly Environment Inspection Form
Reference	• ANZECC/NHMRC Guidelines • NEPM for Assessment of Site Contamination.

8.20 Asbestos	
Standard Environmental Protocol	
Objective	To avoid threat to human health or contamination of the environment in the removal of asbestos materials.
Management Strategy	Investigation of the site to determine the extent and type of asbestos contaminated materials. Site environmental induction to make personnel aware of the presence of asbestos contaminated materials and procedures for their identification and removal. Engagement of a certified, licensed asbestos removal contractor in terms of Environmental Protection regulations.
Action	Generally speaking, asbestos management requires: • Asbestos Management Plan by an Environmental Scientist-- • Asbestos Removal Control Plan by a Licenced Asbestos Removalist—the plan for how to safely undertake the works by the people actually doing it. • Richard Crookes Construction Project Management Plan. Project Manager shall ensure: • Asbestos contaminated areas are identified and restricted to authorised personnel until the contaminated materials have been removed and the area declared safe. • The project hygienist is engaged to assess materials suspected of containing asbestos • The project hygienist is engaged to develop a fully documented Asbestos Management Plan to detail the requirements and controls for removal of all asbestos containing materials • A licensed asbestos removal contractor is engaged to manage the removal and disposal of all asbestos contaminated materials • The licensed Asbestos Removalist to comply with the Richard Crookes Constructions Asbestos Management Procedure; the Asbestos Management Plan and the Australian Government Code of Practice for the Safe Removal of Asbestos. • The project hygienist is to provide Clearance Certificates
Performance Indicators	Satisfactory post-removal monitoring results.
Reporting	Project hygienist to provide site safety clearance certificate and documented evidence of proper disposal.
Applicable Permits	Licence under WHS Regulations
Reference	• Work Health and Safety Regulation 2011 Ch 8 • Asbestos Management Plan • Code of Practice for the Safe Removal of Asbestos

8.21 Hazardous Substances and Dangerous Goods	
Standard Environmental Protocol	
Objective	To avoid contamination of the environment or risk to human health To appropriately manage the discovery of Hazardous Materials on site
Management Strategy	• Site environmental induction to make personnel aware of the project handling and storage procedures to manage Hazardous Substances and Dangerous Goods • All hazardous materials introduced onto site must be accompanied by a MSDS and the material entered onto the project register. • All hazardous materials must be stored in compliance with the manufacturer's recommendations and in accordance with Australian Standards • No bulk fuels are to be retained on site. Refuelling of plant is to be undertaken on a just-in-time basis and only within a prepared designated area. • Any discovery of a hazardous material is immediately reported to the Principal
Action	Project Manager shall ensure that: • Hazardous chemicals are stored in an impervious storage area, which is cool and dry, vented, lockable, and bunded to minimum 110% the volume of the chemical container. • Conflicting chemicals are kept segregated in accordance with AS 3833 and AS 1940. • The quantities of Hazardous Substances and Dangerous Goods on site are minimised. • No bulk diesel is to be stored on site. • Fuelling and maintenance of vehicles and equipment on site is avoided. Where refuelling is unavoidable, the location and procedures will be strictly controlled. • Subcontractors are trained in the use and precautions of their hazardous substances in accordance with the MSDS. • Subcontractors advise the Site Manager of the type of material, location, volume and any special handling / storing precautions in relation to any dangerous gases or flammable materials that are proposed to be brought on site. • Subcontractors do not use any materials which are classified as Hazardous in or adjacent to occupied areas without the prior approval of the Site Manager. • Subcontractors provide a current MSDS for all Hazardous Substances and Dangerous Goods proposed to be brought onto site. A Site MSDS Register is to be developed and maintained. • A Spill Kit and Site Emergency Plan are readily accessible. Clean up materials are disposed of in compliance with regulatory requirements • All oxygen and acetylene cylinders are properly stored in an upright position and adequately restrained away from heat sources. • Persons handling dangerous chemicals and materials will wear appropriate PPE and receive appropriate training in its use • Fuels and hazardous chemicals will not be decanted or handled in the vicinity of the central • drainage line and major stormwater inlet points. Decanting of liquids is to be done in temporary bunded area. • Paint storage does not need to incorporate 110% volumetric bund but should be sufficient to envelope an incidental spill. • Material Safety Data Sheets (MSDS) will be located at the site office for all hazardous and dangerous goods used during construction operations. The contractor will ensure that all materials are handled, used and disposed of in accordance with their MSDS
Performance Indicators	No spillages, incidents or complaints
Reporting	Licenced removal contractor to provide site safety clearance certificate and documented evidence of proper disposal.
Reference	• Work Health and Safety Regulation 2011, s 357 • National Code of Practice "Managing Risks of Hazardous Chemicals in the Workplace" • National Code of Practice "Labelling of Workplace Hazardous Chemicals"

8.22 Pest Animals, Vermin, and Infestation Control	
Standard Environmental Protocol	
Objective	Minimise the possibility of infestation from rats, mice, insects, or other scavenging wildlife.
Management Strategy	• Keep site clean and tidy • Monitor area for infestation • Consult Pest Management Contractor if required
Action	Project Manager shall ensure that: • Keep site clean and tidy with daily clean-ups. • Ensure all putrescible waste is disposed of in an appropriately sealed receptacle. • Six weeks prior to the commencement of any demolition, individual blocks, properties and the surrounding area should be inspected in order to identify the presence and extent of any infestations. Where infestations are identified, appropriate treatments must be implemented by licenced Pest Control Contractors to eliminate infestation before demolition. • Pest animals include: – European rabbits and hares – Mice – Feral or wild pigs – Wild dogs and dingoes – Red foxes • It is not incumbent on Richard Crookes Constructions to destroy these animals, particularly it if it is unsafe to do so. • Minimise ponding and exposed water sources to prevent mosquitos and midgeys. • Ideally, licenced Pest Control Contractors should be consulted for management strategies after the substructure is completed. Frequently the dark cold environment can be a pest habitat which presents an unacceptable working environment. • To prevent rat egress from live drains and sewers to new systems, the live systems should be temporarily sealed off with expanding drainage stoppers until connection to new drainage is completed. Where vermin presents itself as a problem on site, consult a Pest Control company for advice. Do not attempt to address the problem internally.
Performance Indicators	No infestations.
Reporting	None
Reference	• Work Health and Safety Regulation 2011 • Plant Protection Act 1989

8.23 Site Demobilisation	
Standard Environmental Protocol	
Objective	Control and minimise damage to the receiving environment as a result of site demobilisation.
Management Strategy	• Ensure ground is stabilised and operational stormwater controls are commissioned prior to demobilisation. • Clean up during after demobilisation.
Action	Project Manager shall ensure: • Ensure any landscaping is sufficiently stabilised, either of their own accord or supported by an erosion blanket such as jute mesh. Any permanent stormwater that can't be relied on must be continue to supported by erosion and sediment controls that are maintained during the planting establishment period • Tenting of erosion blankets can prevent vegetation growth, and trap wildlife. Ensure good ground contact is made and pinned • Hydroseeding and hydro-mulching can be used for accelerated grass growth for cover and stabilisation • Basins should be removed or integrated into permanent stormwater system. Temporary sediment controls must be installed downslope of this process, and captured water must be properly disposed of. The footprint of the basin will require revegetation • Plan routes of plant access, such as removal of sheds, so that it can be accessed without disturbing earth or vegetation • Conduct a site clean-up before and after shed removal. Invariably a fair amount of rubbish will have accumulated under the sheds
Performance Indicators	Minimal disturbance because of site demobilisation.
Reporting	None
Reference	None

9 EROSION AND SEDIMENT CONTROL PLAN

9.1 INTORDUCTION AND OVERVIEW

The erosion and sediment control plan is established to identify areas of concern in erosion and sediment control at the Baiada site. The controls utilised are shown in the drawings and consist of the following:

9.1.1 WORKSHOP LANE EXTENSION

- Sediment fences (with spill throughs)
- Cattle grid
- Sediment traps
- Scour protections

9.1.2 NEW BUILDING EXCAVATIONS

- Sediment fences (with spill throughs)
- Check Dams
- Scour protections
- Sediment traps

9.1.3 NEW CARPARK EXCAVATIONS

- Sediment fences (with spill throughs)
- Check Dams
- Sediment traps

9.1.4 INTERNAL ROAD EXCAVATIONS

- Sediment fences (with spill throughs)
- Check Dams
- Scour protections
- Sediment traps
- Sediment basin spillway

9.2 MONITORING

The Monitoring of the erosion and sediment control is undertaken as per Appendix B – Environmental Inspection Checklist, The Richard Crookes Constructions team along with their subcontractors are to undertake a weekly site inspection to identify maintenance of the controls in place and rectify where applicable.

9.3 DRAWINGS

Refer below drawings and plans showing the erosion and sediment control implementations to prevent environmental impacts to the site (overleaf):

ALL INFORMATION WITHIN THESE EROSION AND SEDIMENT CONTROL NOTES HAVE BEEN SOURCED FROM MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION (2004) AND THE INTERNATIONAL EROSION CONTROL ASSOCIATION (AUSTRALIA) (IECA) BEST PRACTICE EROSION AND SEDIMENT CONTROL - 2008.

EROSION AND SEDIMENT CONTROL - GENERAL NOTES

WORK AREA

THE DEFINED 'WORK AREA' IS LIMITED TO THE AREA SHOWN WITHIN THE DESIGN DRAWINGS, WITH THE WIDTHS AND ALIGNMENTS BEEN DEFINED THROUGH THE INFORMATION PROVIDED BY THE CLIENT. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE CONSTRUCTED, OPERATED AND MAINTAINED WITHIN THE WORK AREA.

KEY MANAGEMENT PRACTICES

PRINCIPLES OF EROSION AND SEDIMENT CONTROL

AVOIDING EROSION & MINIMISING THE POTENTIAL FOR EROSION IN THE FIRST INSTANCE IS CONSIDERED THE MOST EFFECTIVE WAY OF ENSURING ENVIRONMENTAL OBJECTIVES ARE ACHIEVED. CONTROLLING SEDIMENT AS AN END OF LINE TREATMENT IN THE FIRST INSTANCE SHOULD BE AVOIDED. REDUCING OR AVOIDING EROSION CAN BE ACHIEVED THROUGH THE APPLICATION OF MULTIPLE TECHNIQUES, OFTEN WITH ONE TECHNIQUE SUPPLEMENTING ANOTHER. EXAMPLE TECHNIQUES INCLUDE:

- UNDERSTANDING THE REASONS BEHIND SOIL EROSION (I.E. SOIL PROPERTIES, RUNOFF VOLUME, RUNOFF VELOCITY) AND DEVELOPING A TREATMENT STRATEGY ACCORDINGLY.
- SCHEDULING AND STAGING OF CLEARING, EARTHWORKS, ENGINEERING SERVICES, STABILISATION AND REHABILITATION.
- MINIMISING DISTURBANCE AND THE OVERALL CONSTRUCTION FOOTPRINT.
- INCREASE AND OR MAINTAIN TEMPORARY OR PERMANENT GROUND COVER IN HIGH EROSION RISK AREAS.

THE FOLLOWING PRINCIPLES ARE RECOMMENDED WITHIN MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION(2004) AS THE PRINCIPLES OF ESC AND SHOULD BE CONSIDERED WHEN DEVELOPING AND IMPLEMENTING AN EROSION AND SEDIMENT CONTROL PLAN:

1. ASSESS THE SOIL AND WATER IMPLICATIONS OF DEVELOPMENT AT THE SUBDIVISION OR SITE PLANNING STAGE, INCLUDING THOSE RELATING TO ESD. INVESTIGATE THE SALINITY AND, ON COASTAL LANDS, THE ACID SULPHATE POTENTIALS OF THE SOILS WHERE THEIR DISTURBANCE IS LIKELY TO EXPOSE AND/OR EXACERBATE THIS PROBLEM;
2. PLAN FOR EROSION AND SEDIMENT CONTROL CONCURRENTLY WITH ENGINEERING DESIGN AND BEFORE EARTHWORKS BEGIN, ENSURING PROPER ASSESSMENT OF SITE CONSTRAINTS AND INTEGRATION OF THE VARIOUS COMPONENTS;
3. MINIMISE THE AREA OF SOIL DISTURBED AND EXPOSED TO EROSION;
4. CONSERVE TOPSOIL FOR LATER SITE REHABILITATION/REVEGETATION;
5. CONTROL WATER FLOW FROM THE TOP OF, AND THROUGH THE DEVELOPMENT AREA;
6. REHABILITATE DISTURBED LANDS QUICKLY; AND
7. MAINTAIN SOIL AND WATER MANAGEMENT MEASURES APPROPRIATELY DURING THE CONSTRUCTION PHASE.

RECOMMENDED MANAGEMENT ACTIONS

- IMPLEMENTATION OF THE PRINCIPLES OF ESD MEANS THAT PLANNING FOR SOIL AND WATER MANAGEMENT WILL BE BASED ON ASSESSMENT OF THE PHYSICAL CONSTRAINTS PRESENT AT THE SITE. THESE INCLUDE

A.RAINFALL EROSIVITY
B.FLOODING LIABILITY
C.TOPOGRAPHY
D.SOILS(ERODIBILITY, DISPERSIBILITY, SALINITY, SHRINK SWELL CAPACITY, DRAINAGE CHARACTERISTICS, MASS MOVEMENT POTENTIAL, ETC)

- THE PREPARATION OF SITE DEVELOPMENT PLANS SHOULD

A.OFFER SOLUTIONS THAT ENSURE THAT ANY DEVELOPMENT IS ECOLOGICALLY SUSTAINABLE, BEING CONSIDERATE OF THE IMMEDIATE AND EVENTUAL EFFECT OF DEVELOPMENT ON
1. THE QUALITY AND QUANTITY OF BOTH SURFACE WATER AND GROUND WATER
2. WATERFRONT(RIPARIAN) ECOSYSTEMS;

B.CONSIDER THE CUMULATIVE EFFECT OF EACH PARTICULAR DEVELOPMENT PROGRAM TO OTHER DEVELOPMENT WITHIN THE CATCHMENT AREA;
C.ENABLE A CHOICE OF SOIL AND WATER MANAGEMENT STRUCTURES AND STRATEGIES THAT SHOULD CONSIDER ASPECT OTHER THAN JUST CAPITAL OUTLAYS, E.G. ENVIRONMENTAL CONSIDERATIONS, COSTS RELATING TO MAINTENANCE AND REPLACEMENT;
D.CONSIDER THE NATURE OF ANY SPECIFIC PLAN FOR CONTROL OF SOIL EROSION, SEDIMENTATION AND POLLUTION;
E.BE UNDERTAKEN IN CONCEPT BEFORE AND AT THE DEVELOPMENT APPLICATION STAGE; AND
F.BE UNDERTAKEN IN DETAIL AT THE FINAL ENGINEERING PLAN STAGE.

- IT IS NOT SUFFICIENT TO RETROFIT EROSION AND POLLUTION MANAGEMENT STRATEGIES TO DEVELOPMENTS THAT HAVE ESSENTIALLY COMPLETED THE ENGINEERING PLAN STAGE.
- ELEMENTS TO BE INCLUDED IN PLANS FOR SOIL AND WATER MANAGEMENT INCLUDE:

A.THE PHASING OF WORKS SO THAT LAND DISTURBANCE IS CONFINED TO MINIMUM AREAS OF WORKABLE SIZE, BUT CONSISTENT WITH THE SCALE AND ECONOMICS OF THE DEVELOPMENT.
B.ENSURE CORRECT STOCKPILING OF TOPSOIL
C.GIVE PRIORITY TO THOSE BMPS THAT MITIGATE SOIL EROSION IN THE FIRST PLACE, RATHER THAN TO THOSE THAT CAPTURE SEDIMENT DOWNSLOPE OR AT THE CATCHMENT OUTLET(I.E. CONCENTRATE ON SOURCE CONTROLS). DIVERTING UPSLOPE WATERS AROUND WORKS IS ESPECIALLY IMPORTANT.
D.INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS A FIRST STPE IN THE WORK'S PROGRAM AND MAINTAIN THESE IN AN EFFECTIVE CONDITION UNTIL EARTHWORKS ARE COMPLETED AND THE SITE REHABILITATED.
E.INTEGRATE SOIL EROSION AND SEDIMENT CONTROL, STORMWATER AND POLLUTION CONTROL WORKS.
F.WHERE APPROPRIATE, REDUCE THE EFFECTS OF WIND EROSION.
G.REHABILITATED THE SITE TO ENSURE THAT DISTURBED LANDS ARE STABILISED AND INTEGRITY IS MAINTAINED.
H.REDUCE MAINTENANCE NEEDS AND OTHER ONGOING COASTS BY INTEGRATING ALL SOIL AND WATER MANAGEMENT WORKS IN THE CONSTRUCTION PHASE.
I.ENSURE THAT ALL EROSION AND SEDIMENT CONTROL MEASURES ARE KEPT IN A FUNCTIONING CONDITION UNTIL ALL SITE DISTRUBANCE WORKS ARE COMPLETED AND THE SITE IS REHABILITATED.

DRAINAGE CONTROL

WHERE PRACTICAL, UP-SLOPE 'CLEAN' WATER MUST BE DIVERTED AROUND THE DISTURBED OR ACTIVE WORK AREAS. CLEAN WATER FLOW CATCH DRAINS AND DIVERSION BANKS (GENERALLY CONSTRUCTED OF TOPSOIL STRIPPED FROM THE WORK AREA, AND WHERE REQUIRED ARE PROVIDED WITH EFFECTIVE EROSION PROTECTION) ARE TO BE CONSTRUCTED ON THE UP-SLOPE SIDE OF THE WORKS AREA AS NOMINATED ON THE ESC DRAWINGS. WHERE SEPARATION OF CLEAN AND DIRTY WATER IS NOT POSSIBLE, BOTH SOURCES MUST BE COMBINED AND TREATED AS DIRTY WATER. DIRTY WATER DRAINAGE, AS NOMINATED ON THE ESC DRAWINGS IS TO BE CONSTRUCTED TO ENSURE THAT SEDIMENT-LADEN RUNOFF FROM DISTURBED OR ACTIVE WORK AREAS IS APPROPRIATELY DIRECTED INTO THE NOMINATED SEDIMENT CONTROL MECHANISM OR SEDIMENT TRAP.

SOIL MANAGEMENT

DURING THE CONSTRUCTION PHASE, EARTHWORKS SHOULD ONLY BE UNDERTAKEN WHEN THE SOIL MOISTURE CONTENT CAN MAINTAIN THE SOIL PROPERTIES. EARTHWORKS ON DRY SOIL CAN CAUSE EXCESSIVE DUST AND SOIL STRUCTURE DECLINE. SATURATED SOILS ARE MORE LIKELY TO SLUMP AND OR DISPERSE POTENTIALLY CAUSING EXCESSIVE SEDIMENT LOADS AND SOIL STRUCTURE DECLINE. WHERE TOPSOIL IS REQUIRED TO BE STRIPPED AND STOCKPILED PRIOR TO CONSTRUCTION, THE TOPSOIL SHOULD BE MANAGED TO MAINTAIN ITS EXISTING PROPERTIES. EROSION CONTROL AROUND TOPSOIL STOCKPILES MUST ALSO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PHASE.

SOIL TESTING

TESTING OF SOILS PROVIDES ADDITIONAL INFORMATION ON THE CHARACTERISTICS WITHIN THE SOILS OF THE WORK AREA. TESTING RELATED TO EROSION CHARACTERISTICS INCLUDE: SOIL TEXTURE, CATION EXCHANGE CAPACITY (CEC), EXCHANGEABLE SODIUM PERCENTAGE (ESP), EXCHANGEABLE CATIONS, PH AND ELECTRICAL CONDUCTIVITY (EC), FIELD EMERSON TESTING, AND EMERSON DISPERSION. SOIL TESTING IS RECOMMEND TO OBTAIN ADDITIONAL INFORMATION ON THE CHARACTERISTICS OF THE SOILS WITHIN THE WORK AREA TO BE USED IN DETERMINING THE EROSION CONTROL STRATEGY. LIMITED SPECIFIC SOIL INFORMATION AND TESTING REQUIRES CONSERVATIVE ESTIMATES FOR SOIL ERODIBILITY TO BE USED. USING CONSERVATIVE VALUES TO ESTIMATE SOIL ERODIBILITY POTENTIALLY INCREASES THE LEVEL OF EROSION AND SEDIMENT CONTROL REQUIRED. TESTING AND ANALYSIS OF TOPSOIL TO DEFINE AND OPTIMISE THE PARAMETERS FOR REHABILITATION (I.E. NUTRIENT STATUS) SHOULD BE UNDERTAKEN PRIOR TO REHABILITATION.

SITE CONSTRAINTS AND CHARACTERISTICS

CONSTRAINTS/OPPORTUNITY	VALUE
RAINFALL EROSIVITY	LOW (R-FACTOR 1600, FROM MAP 6 IN APPENDIX B IN LANDCOME (2004))
SLOPE GRADIENTS	
POTENTIAL EROSION HAZARD	LOW (FROM FIGURE 4.6 IN LANDCOME(2004))
RAINFALL ZONE	ZONE 6 (FROM FIGURE 4.9 IN LANDCOME(2004))
SOIL EORDIBILITY	LOW (HIGHEST K-FACTOR =0.047, FROM GEOTECHNICAL REPORT)
CALCULATED SOIL LOSS	94.73 M3/HA/YR
SOIL LOSS CLASS	2
SOIL TEXTURE GROUP	GROUP B/C (TABLE C8 IN LANDCOME (2004))
PERCENT DISPERSIBLE(SUBSOIL)	INSIGNIFICANT (EMERSON CLASS 3,4 and 5)
RUNOFF COEFFICIENT	0.5 (ADOPTED)
DISTURBED SITE AREA	

CONSTRUCTION ASSUMPTIONS

A SERIES OF ASSUMPTIONS HAVE BEEN MADE REGARDING THE CONSTRUCTION PHASE WITHIN THE PREPARATION OF THESE NOTES. DURING CONSTRUCTION WORKS, IF THE ASSUMPTIONS ARE IDENTIFIED OR ENVISAGED TO BE INCONSISTENT WITH THE ACTUAL CONSTRUCTION PROCESSES OR SITE CONDITIONS, THE ESC CONTROLS MAY REQUIRE UPDATING TO REFLECT THE ADDITIONAL OR ACTUAL CONDITIONS EXPERIENCED ON SITE. FURTHERMORE THE CORRESPONDING EROSION AND SEDIMENT CONTROL PLAN MAY REQUIRE IMMEDIATE REVISION

- EARTHWORKS E.G. CUT OR FILL BATTER SLOPES WILL BE CONSTRUCTED TO ALLOW ALL ESC DEVICES TO REMAIN WITHIN THE DEFINED WORK AREA.
- WORKS WILL BE STAGED TO MINIMISE THE TIME OF EXPOSURE OF SOILS, PARTICULARLY WORKS ASSOCIATED WITH DRAINAGE PATHS AND OR WATERWAYS
- WORKS WILL NOT COMMENCE IN HIGH RISK AREAS IF A FORECAST RAINFALL EVENT THAT IS LIKELY TO PRODUCE MORE THAN APPROXIMATELY 25MM IS FORECAST, UNLESS EROSION AND SEDIMENT CONTROLS CAN BE EFFECTIVELY ESTABLISHED PRIOR TO THE EVENT; AND
- SOIL WITHIN THE WORK AREA WILL BE ASSESSED FOR DISPERSION POTENTIAL AND TREATED WITH GYPSUM IF REQUIRED.

METHODOLOGY AND INSTALLATION SEQUENCE FOR CONSTRUCTION WORKS

KEY EROSION AND SEDIMENT CONTROL ITEMS TO BE COMPLETED PRIOR TO COMMENCING BROAD SCALE LAND DISTURBANCE. REFER TO THE APPROVED ESC DRAWING FOR THE INDICATIVE LOCATION OF DRAINAGE, EROSION AND SEDIMENT CONTROLS. REFER TO TYPICAL DETAILS AND TECHNICAL NOTES FOR NOMINATED DRAINAGE, EROSION AND SEDIMENT CONTROLS

KEY CONTROL ITEMS ARE AS FOLLOWS:

1. ESTABLISH STABILISED SITE ACCESS
2. INSTALL PERIMETER SEDIMENT FILETERS AND SEDIMENT FENCES.
3. INSTALL CLEAN WATER DIVERSIONS

- STRIP AND RELOCATE THE TOPSOIL TO CONSTRUCT A 'CLEAN WATER' FLOW DIVERSION BANK ON THE UP-SLOPE WHERE POSSIBLE AS DETAILED ON THE APPROVED ESC DRAWINGS OR STOCKPILE AND PROVIDE ADEQUATE CONTROLS SUCH AS MULCH BUNDS OR SEDIMENT FENCE
- EXPOSED SECTIONS OF THE 'CLEAN WATER' FLOW DIVERSION BANK THAT WILL EXPERIENCE MEDIUM TO HIGH CONCENTRATIONS AND VELOCITIES OR CLEAN WATER MAY REQUIRE SCOUR PROTECTION. SCOUR PROTECTION MAY INCLUDE:

•• MEDIUM PROTECTION, PLACE A LAYER OF LIQUID POLYMER AT A RATE OF 500mL/m_2 ON THE UPSLOPE SIDE OF THE 'CLEAN WATER' FLOW DIVERSION BANK. THE LIQUID POLYMER IS TO EXTEND APPROXIMATELY 300mm ON THE UPSLOPE EXISTING GROUND SURFACE.

•• MEDIUM TO HIGH PROTECTION, INSTALL EROSION CONTROL BLANKET (ECB) OR GEOTEXTILE FABRIC (APPROXIMATE ROLL WIDTH 1.2M) TO THE UPSLOPE SURFACE OF THE 'CLEAN WATER' FLOW DIVERSION BANK. THE LINING IS TO EXTEND APPROXIMATELY 500MM UP THE NEWLY CONSTRUCTED FACE OF THE BANK AND REMAINDER OF ROLL TO COVER THE UPSLOPE EXISTING GROUND SURFACE. THE LINING IS TO BE PINNED AS PER THE MANUFACTURERS RECOMMENDATIONS TO MAINTAIN CON TACT WITH THE SOIL.

- WHERE 'CLEAN WATER' DIVERSION BANKS ARE NOT SUITABLE, CUT OFF DRAINS ARE TO BE CONSTRUCTED AND LINED WITH NON DISPERSIVE SOIL OR BE TREATED WITH A LAYER OF LIQUID POLYMER AT A RATE OF 600mL/m_2 TO THE FULL WIDTH OF DISTURBED AREA.

4. CONSTRUCT SEDIMENT BASIN
5. INSTALL DIRTY WATER DIVERSIONS TO BASINS

- CONSTRUCT CATCH DRAINS OR TOPSOIL DIVERSION BANKS ON THE DOWN-GRADIENT SIDE OF THE WORKS TO RETAIN WATER WITHIN THE DISTURBED LIMITED. MUST USE NON-DISPERSIVE SOIL.

6. COMPLETE ALL OTHER INITIAL ESC WORKS

CLEARING, GRUBBING AND EARTHWORKS ASSOCIATED WITH DRAINAGE PATHS E.G. GULLY CROSSINGS AREA ARE TO BE DELAYED AS LONG AS IS PRACTICABLE AND BE MINIMISED WHERE POSSIBLE.

VEGETATION WHICH HAS BEEN CLEARED IS TO BE MULCHED AND USED AS PART THE EROSION AND SEDIMENT CONTROL PLANS WHERE POSSIBLE

INSTALL CROSS BANKS AND SEDIMENT TRAPS AS SOON AS PRACTICABLE OR IF RAIN IS FORECAST WITHIN 24 HOURS DURING GROUND SURFACE TREATMENT OPERATIONS.

WHERE SIGNIFICANT QUANTITIES OF SUBSOIL AND CUT FROM THE WORK AREA, THE MATERIAL IS TO BE STOCKPILED IN A DEDICATED AREA WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS.

INSTALL ALL EROSION CONTROL MEASURES (E.G. SOIL BINDER, MULCH, GRAVEL, OR ROCK MULCH) WITHIN THE DISTURBED AREAS AS SOON AS PRACTICABLE, OR IF RAIN IS FORECAST WITHIN 24 HOURS.

CONTROL TRAFFIC ON ALL AREAS WHERE SOIL BINDER HAS BEEN USED FOR EROSION CONTROL TO PREVENT DAMAGE TO THE SURFACE.

WATERWAY CROSSINGS (BED LEVEL CROSSINGS AND OR PIPE CULVERTS) IF ANY ARE TO BE INSTALLED AS REQUIRED FOR ACCESS.

REHABILITATION IS RECOMMENDED TO COMMENCE AS SOON AS PRACTICAL WITH DRAINAGE PATHS E.G. GULLY CROSSING AREAS REHABILITATED AS A PRIORITY.

ONGOING OPERATION, MONITORING AND MAINTENANCE

1. MONITORING OF EROSION AND SEDIMENT CONTROLS SHOULD BE CONDUCTED AT INTERVALS NO GREATER THAN SEVEN (7) DAYS APART.
2. ADDITIONAL MONITORING AND MAINTENANCE SHOULD BE CONDUCTED WITHIN 12 HOURS OF A FORECAST RAINFALL EVENT THAT WOULD PRODUCE RUNOFF AND BEFORE SITE CLOSURE.
3. ONGOING MONITORING AND MAINTENANCE SHOULD BE CONDUCTED DAILY DURING PROLONGED RAINFALL EVENTS.
4. INSPECTIONS WITHIN 18 HOURS AFTER RAINFALL EVENTS PRODUCING RUNOFF ARE REQUIRE TO ASSESS THE ONGOING INTEGRITY AND FUNCTIONALITY OF EROSION AND SEDIMENT CONTROLS AND ADJOINING DRAINAGE. GENERAL INSPECTION CONSIDERATIONS INCLUDE:

- INLET AND DISCHARGE AREAS FOR DAMAGE OR EXCESSIVE SCOUR
- CHANNEL BANKS DIRECTING RUNOFF TO THE SEDIMENT TRAP FOR DAMAGE FROM OVERTOPPING FLOWS
- EXCESSIVE SEDIMENTATION E.G. MORE THAN 25% OF ORIGINAL SEDIMENT TRAP VOLUME AND
- INTEGRITY OF TEMPORARY GROUND COVER
- DESILTING OF SEDIMENTATION BASINS AND OTHER SEDIMENT CONTROL DEVICES.
- CORRECTIVE OR RESTORATIVE MAINTENANCE IS TO BE SCHEDULED AND COMPLETED AS NECESSARY I.E. PRIOR TO RAINFALL EVENTS.
-
- REMOVAL AND DISPOSAL OF WATER, SEDIMENT AND OR CORRECTIVE WORK IS TO BE UNDERTAKEN IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

THE CONTRACTOR IS TO COMPLETE A SUITABLE ESC CHECKLIST (REFER TABLE 8.2 AND 8.3 IN MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION) AS PART OF ALL MONITORING AND MAINTENANCE INSPECTIONS. COPIES OF COMPLETED CHECKLISTS ARE TO BE STORED ON SITE AND MADE AVAILABLE TO REGULATORY AUTHORITY UPON REQUEST.

SEDIMENT BASIN - GENERAL NOTES

KEY PRINCIPLES

SEDIMENT BASINS ARE GENERALLY USED AS AN END OF LINE SEDIMENT CONTROL MEASURE AT THE END OF TEMPORARY DRAINAGE CHANNELS WITHIN CATCHMENTS GREATER THAN 0.25HA. APPROPRIATELY DESIGNED, CONSTRUCTED AND OPERATED SEDIMENT BASINS ARE CLASSED AS A TYPE 1 SEDIMENT TRAP. SEDIMENT BASINS MAY BE DOWNGRADED TO A TYPE 2 SEDIMENT TRAP IF INAPPROPRIATELY DESIGNED, OPERATED OR MAINTAINED AND THEREFOR BECOME NON COMPLIANT.

SEDIMENT COLLECTION IS ACHIEVED THROUGH GRAVITY INDUCED SEDIMENTATION, AUTOMATIC FLOCCULATION IS CONSIDERED TO BE AN ESSENTIAL PART OF THE TYPE A HES BASIN. THE HES BASINS CONSIST OF AN INLET CHAMBER, WHERE THE FLOCCULENT/COAGULANT IS APPLIED AND MIXED, FOLLOWED BY A SETTLING ZONE. THE OUTFLOW MECHANISMS OF A HES BASIN CONSIST OF A HIGH FLOW EMERGENCY SPILLWAY AND AN AUTOMATIC DECANTER. A LEVEL SPREADER SEPARATES THE INLET CHAMBER FROM THE SETTLING ZONE. THE LEVEL SPREADER IS TO BE KEYED INTO THE EMBANKMENT AS PER THE DETAIL WITHIN THIS DRAWING SET.

"FIELD" EMERSON TESTING MUST BE UNDERTAKEN TO DETERMINE THE OPTIMUM FLOCCULENT PRODUCT AND DOSAGE, INCLUDING COMPLETION OF FLOC REPORT. THIS PROCESS IS TO BE CONTINUALLY MONITORED THROUGHOUT THE LIFESPAN OF THE BASIN. APPENDIX E OF MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION SPECIFIES THE METHOD FOR TESTING.

SEDIMENT RETENTION BASINS SHOULD BE BUILT TO INCORPORATE:
A.A PRIMARY OUTLET DESIGNED;
- TO HAVE A CAPACITY TO PASS THE PEAK FLOW FROM THE DESIGN STORM EVENT
- WITH AN INVERT LEVEL AT LEAST 300mm BELOW ANY EMERGENCY OUTLET (WHERE IT IS A SEPARATE STRUCTURE);

B.AN EMERGENCY SPILLWAY DESIGNED TO HAVE A CAPACITY TO PASS THE PEAK FLOW FROM THE APPLICABLE STORM EVENT.
C.INTERNAL BATTER GRADIENTS FOLLOW UPPER LIMITS:
- WHERE WATER DEPTH IS LESS THAN 150mm WHEN SURCHARGING, 2.5(H):1(V) TO 4(H):1(V) ON EARTH STURCTURES AND VERTICAL ON ROCK OR GABION STRUCTURE
- WHERE WATER DEPTH IS BETWEEN 150mm AND 1,500mm WHEN PROTECTED AND SURCHARGING OR GREATER THAN 1,500mm,
  - 2.5(H):1(V) to 4(H):1(V) ON EARTH STRUCTURE
  - 0.5(H):I(V) ON ROCK GIBBER STRUCTURES
  - 1(H):4(V) ON GABION BASKET STRUCTURES
  - 1(H): 4(V) ON STACKED (ROUGH SQUARED) ROCK STRUCTURES;
- APPROPRIATE OUTLET PROTECTION TO ENSURE MINIMISATION OF SCOUR

CONSTRUCTION

CONSTRUCT THE SEDIMENT BASIN IN ACCORDANCE WITH THE APPROVED PLANS (I.E. LOCATION, DIMENSIONS AND CONSTRUCTION DETAILS AND SPECIFICATIONS). AN ASSESSMENT OF THE 'AS CONSTRUCTED' SEDIMENT BASIN IS TO BE CONDUCTED BY SUITABLY QUALIFIED PERSON/S. CERTIFICATION OF THE CONSTRUCTED SEDIMENT BASIN IS TO BE UNDERTAKEN BY AN APPROPRIATELY QUALIFIED PERSON IN ACCORDANCE WITH THE 'CERTIFICATE OF SEDIMENT BASIN CONSTRUCTION' WITHIN APPENDIX B OF THE IECA GUIDELINES.

MATERIALS

SEDIMENT BASINS ARE TO BE CONSTRUCTED USING SUITABLE MATERIAL I.E. CLEAN (NON-DISPERSIVE) SOIL. SOIL IS TO BE FREE OF WOODY VEGETATION AND ROOTS, ROCKS OR OTHER UNSUITABLE MATERIAL. SOIL WITH EMERSON CLASS 4 AND 5 MAY NOT BE SUITABLE DEPENDING ON PARTICLE SIZE DISTRIBUTION AND DEGREE OF DISPERSION. SOIL WITH AN EMERSON CLASS 2 SHOULD ONLY BE USED UPON RECOMMENDATION FROM GEOTECHNICAL SPECIALIST WITH THE BASIN TO BE LINED WITH GEOFABRIC AS APPLICABLE. SEEK ADDITIONAL ADVICE REGARDING MATERIAL SUITABLY IF REQUIRED.

INSTALLATION

1. DELAY CLEARING THE UP-SLOPE POND AREA UNTIL THE SEDIMENT BASIN HAS BEEN CONSTRUCTED AND IS ABLE TO ACT AS A SUITABLE SEDIMENT TRAP.
2. INSTALL EROSION CONTROL IN THE FIRST INSTANCE IN THE UPSTREAM CATCHMENT.
3. INSTALL REQUIRED TEMPORARY SEDIMENT CONTROL MEASURES DOWNSTREAM OF THE PROPOSED EARTHWORKS TO CONTROL SEDIMENT RUNOFF DURING CONSTRUCTION OF THE BASIN.
4. THE FOOTPRINT OF THE EMBANKMENT MUST BE CLEARED OF UNSUITABLE MATERIAL IE. TOPSOIL, UNSUITABLE SOIL, VEGETATION MATERIAL (TREES, STUMPS, ROOTS, DEAD TIMBER), WITH LARGE VOIDS TO BE FILLED AND COMPACTED.
5. CLEARING THE MAIN POND AREA IS TO BE DELAYED UNTIL THE EMBANKMENT IS COMPLETED.
6. TOPSOIL IS TO BE APPROPRIATELY STOCKPILED FOR REHABILITATION AS NECESSARY WITH EFFECTIVE EROSION CONTROL AND SEDIMENT CONTROL DOWNSLOPE.
7. EXCAVATE A CUT-OFF TRENCH ALONG THE CENTRE-LINE OF THE EARTH EMBANKMENT 600MM DEEP WITH SIDE SLOPES NO STEEPER THAN 1:1(H:V).
8. THE BASE OF CUT OFF TRENCH IS TO BE SUFFICIENTLY WIDE TO ALLOW ADEQUATE COMPACTION AND BE FREE FROM LOOSE OR UNSUITABLE MATERIAL.
9. BACKFILL AND COMPACT WITH SELECT EARTH/SOIL FILL TO THE REQUIRED COMPACTION AND MOISTURE SPECIFICATION.
10. KEY IN MAIN EMBANKMENT TO PREPARED FOOTPRINT SURFACE USING SCARIFICATION.
11. CONSTRUCT THE MAIN EMBANKMENT WITH SELECT EARTH/SOIL FILL IN CONTINUOUS 150 TO 250MM LAYERS AND COMPACT TO THE REQUIRED COMPACTION AND MOISTURE SPECIFICATION.
12. UNLESS OTHERWISE SPECIFIED ON THE APPROVED PLANS, COMPACT THE SOIL AT APPROXIMATELY 1% TO 2% OF OPTIMUM AND TO 100% STANDARD COMPACTION RECOGNISING THE OPTIMUM MOISTURE CONTENT.
13. ALL LOOSE UNCOMPACTED EARTH-FILL MATERIAL ON THE UPSTREAM AND DOWNSTREAM BATTER MUST BE REMOVED PRIOR TO SPREADING OF TOPSOIL.
14. STABILISE ASSOCIATED EXPOSED EARTH EMBANKMENTS IMMEDIATELY AFTER CONSTRUCTION THROUGH APPROPRIATE COMPACTION, TOPSOIL VEGETATION AND/OR EROSION CONTROL MATTING.
15. CONSTRUCT THE SPILLWAY SECTION TO THE SPECIFIED FLOW RATES OR DIMENSIONS.
16. WHERE SPECIFIED THE SPILLWAY MUST BE LINED WITH GEOTEXTILE FABRIC (HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM 'BIDIM' A24 OR EQUIVALENT)

- EXTEND INTO THE UPSTREAM BASE ON POND AND ADEQUATELY SECURE
- OVERLAP SIDE LAPS EDGES A MINIMUM OF 300MM
- FLOW DIRECTION OVERLAPS (IF REQUIRED) TO BE KEYED IN BY BURYING 300MM THE UPSLOPE EDGE AND RECOMPACTING
- PINNED OVERLAPS AT MINIMUM 1M SPACING AND GENERALLY FIVE PINS PER M2
- ENSURE FABRIC IS NOT DAMAGED DURING PLACEMENT OF ROCK. IF REQUIRED REPAIR AS NECESSARY OVERLAPPING 300MM AND SECURELY PINNING.

17. WHERE ROCK IS SPECIFIED:

- INSTALL WITHOUT DAMAGING GEOTEXTILE LINING (INSTALL PROTECTIVE LAYER OF GRAVEL/AGGREGATE OR SAND IF REQUIRED).

18. SPECIFIC GRAVITY OF 2.5 (DESIRED).
19. TO BE HARD, ANGULAR, DURABLE, WEATHER RESISTANT AND EVENLY GRADED ROCK WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL (D50) ROCK SIZE.
20. THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE.
21. INSTALLED TO ACHIEVE A RELATIVELY CONSISTENT GRADED AND STABILISED SURFACE.
22. SMALL ROCK MUST FILL THE VOIDS BETWEEN THE LARGER ROCK.
23. THE FINAL DISCHARGE AREA MUST BE STABILISED TO ENSURE CONTROLLED DISCHARGE FLOWS AND PREVENT SCOURING.
24. NECESSARY UP-SLOPE DRAINAGE CONTROL MEASURES MUST BE ESTABLISHED TO ENSURE THAT SEDIMENT-LADEN RUNOFF IS APPROPRIATELY DIRECTED INTO THE SEDIMENT TRAP.
25. INSTALL A SEDIMENT STORAGE LEVEL MARKER POST WITHIN SEDIMENT STORAGE ZONE WHICH IS AT MINIMUM THE SAME HEIGHT AS THE TOP OF BUND. ENSURE THE TOP OF SEDIMENT STORAGE ZONE IS CLEARLY MARKED.
26. NOTIFY CONSTRUCTION STAFF OF THE DESIGN PUMP OUT WATER HEIGHT.
27. INSTALL (IF SPECIFIED), INTERNAL SETTLING POND BAFFLES BELOW, THE ELEVATION OF THE EMERGENCY SPILLWAY CREST.
28. INSTALL (AS REQUIRED) ACCESS POINTS FOR OPERATION AND MAINTENANCE EG. DESILTING ACCESS AND STABILISED DEWATERING POINTS.
29. POTENTIAL SAFETY AND OR ENVIRONMENTAL RISKS SHOULD BE ASSESSED FOR THE CONSTRUCTION AND OPERATIONAL STAGES AND MANAGED APPROPRIATELY EG. BARRIER FENCING OR INTERNAL SIDE SLOPE TO ALLOW EGRESS OF WILDLIFE OR FAUNA AS NECESSARY.
30. SEEK CLARIFICATION IF ANY ASPECT OF THE CONSTRUCTION OF THE SEDIMENT TRAP IS IN QUESTION.

OPERATION, MAINTENANCE AND MONITORING

INSPECTIONS AFTER RAINFALL EVENTS PRODUCING RUNOFF ARE REQUIRED TO ASSESS THE ONGOING INTEGRITY AND FUNCTIONALITY OF THE SEDIMENT TRAP AND ADJOINING DRAINAGE. CORRECTIVE OR RESTORATIVE MAINTENANCE IS TO BE SCHEDULED AND COMPLETED AS NECESSARY I.E. PRIOR TO RAINFALL EVENTS. THE SEDIMENT BASIN MUST BE DEWATERED WHERE POSSIBLE PRIOR TO RAINFALL EVENTS PREDICTED MORE THAN 25MM OF RAINFALL.

1. ADDITIONAL MONITORING AND MAINTENANCE SHOULD BE CONDUCTED WITHIN 12 HOURS OF A FORECAST RAINFALL EVENT THAT WOULD PRODUCE RUNOFF. REFER IECA GUIDELINES FOR DETAILED INSPECTION REQUIREMENTS.
2. GENERAL INSPECTION CONSIDERATIONS INCLUDE:

- OUTFLOW OR DOWNSTREAM WATER QUALITY, 'CLARITY'
- CHECK EMBANKMENTS FOR EXCESSIVE SETTLEMENT, SLUMPING OR PIPING
- INLET AND DISCHARGE AREAS FOR DAMAGE OR EXCESSIVE SCOUR
- DIVERSION BANKS AND DRAINAGE DIRECTING RUNOFF TO THE SEDIMENT TRAP FOR DAMAGE FROM OVERTOPPING FLOWS
- EXCESSIVE SEDIMENTATION SHALL BE REMOVED APPROPRIATELY I.E. GREATER THAN THE ORIGINAL SEDIMENT VOLUME
- REMOVAL AND DISPOSAL OF WATER, SEDIMENT AND OR CORRECTIVE WORK IS TO BE UNDERTAKEN IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD

3. FLOCCULANTS ARE TO BE USED TO ASSIST WATER TREATMENT WITHIN THE SEDIMENT TRAP TO ACHIEVE THE REQUIRED DISCHARGE CRITERIA. GENERAL CONSIDERATIONS INCLUDE:

- USE OF AN APPROPRIATE FLOCCULANTS THAT WILL BE EFFECTIVE FOR THE SOIL TYPES IN THE AREA
- CORRECT DOSAGE OF FLOCCULANTS VIA AUTOMATED DOSING UNITS WILL REQUIRE ACCURATE ESTIMATION OF THE FLOW RATE OF WATER ENTERING THE SEDIMENT TRAP
- ENSURING THE FLOCCULANTS USED WILL NOT HAVE A DETRIMENTAL EFFECT ON WATERWAYS, WITH PARTICULAR CAUTION REQUIRED FOR ALUMINIUM BASED FLOCCULANTS
- TYPE D SOILS WILL REQUIRE A COAGULANT TREATMENT AND APPROPRIATE MIXING IN CONJUNCTION WITH FLOCCULATION.

EVENT BASED WATER QUALITY MONITORING IS REQUIRED TO DEMONSTRATE EFFECTIVENESS OF THE BASIN. TOTAL SUSPENDED SOLIDS (TSS) WITHIN THE DISCHARGED WATER SHOULD NOT EXCEED 50mg/L. TURBIDITY TESTING MAY BE CONDUCTED AS AN INDICATION OF TSS RESULTS. TURBIDITY TESTING IS NOT A SUITABLE REPLACEMENT FOR TSS TESTING. pH OF DISCHARGED WATER SHOULD BE IN THE RANGE OF 6.5 TO 8.5

FLOC PERFORMANCE REPORTS ARE REQUIRED TO DEMONSTRATE THE EFFECTIVENESS OF THE CHOSEN FLOCCULANT PRODUCT AND DOSAGE. RECORDS OF WATER QUALITY RESULTS ARE TO BE KEPT ON SITE AND MADE AVAILABLE TO REGULATORY AUTHORITY UPON REQUEST.

DECOMMISSIONING

WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN ASSESSED AND APPROVED AS BEING SATISFACTORILY STABILISED, THE SEDIMENT TRAP MAY BE DECOMMISSIONED. GENERAL CONSIDERATIONS INCLUDE:

- SEDIMENT BASIN MUST BE DE-WATERED AND DE-SILTED PRIOR TO COMMISSIONING. IT IS RECOMMENDED THAT SILT IS REMOVED FROM SITE HOWEVER IF IT IS TO BE RE-SPREAD, SILT MUST BE EFFECTIVELY MIXED WITH STABLE SOILS
- DISTURBED AREAS ASSOCIATED WITH THE SEDIMENT TRAP ARE TO BE REINSTATED AND REHABILITATED TO CONFORM TO THE ADJOINING LAND FEATURES E.G. COMPACTION, SLOPE, VEGETATION
- DECOMMISSIONING IS TO BE UNDERTAKEN IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD IN THE DIRECT OR ADJOINING AREAS ASSOCIATED WITH THE SEDIMENT TRAP.
- WHERE PRACTICAL, DO NOT DECOMMISSION TEMPORARY SEDIMENT RETENTION BASINS AND TRAPS UNTIL THE WORKS FOR WHICH THEY WERE DESIGNED ARE COMPLETED AND FULLY STABILISED ON MORE THAN 90 PERCENT OF THE CONTRIBUTING CATCHMENT.

FOR CONSTRUCTION

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ALTERATIONS

ISSUE	DESCRIPTION	APPD	DATE
A	FOR TENDER	LS	16.09.22
B	ISSUE FOR TENDER	LS	22.11.22
C	FOR INFORMATION	LS	24.02.23
D	FOR APPROVAL	LS	03.03.23
1	FOR CONSTRUCTION	LS	24.03.23

CLIENT: BAIADA POULTRY

MANAGING CONTRACTOR: BESIX Watpac

CONSULTANT: mpn consulting
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JOB NUMBER: 8758

DESIGNED	KC
DESIGN CHECKED	KC
DRAWN	VL
DRAWING CHECK	KC
APPROVED:	LS
RPEQ.	

SHEET NAME: EROSION AND SEDIMENT CONTROL NOTES

PROJECT: OAKBURN POULTRY PROCESSING FACILITY
TAMWORTH, NSW 2340

PROJECT NUMBER: A502

DRAWING NUMBER: A502-EW-MP-CV-DRG-SW-1001

ISSUE: 1

EROSION AND SEDIMENT CONTROL PLAN SHEET 1

MPNC
SK.01
23/03/2023

DETENTION BASIN TO BE UTILISED AS CONSTRUCTION STAGE SEDIMENT BASIN

V-NOTCH WEIR. REFER DWG No. SKC.02 FOR DETAIL

TOP OF BUND RL 381.33

PROPOSED DETENTION BASIN A (STAGE 2)

90m WIDE LEVEL SPREADER. 70m MIN. DISTANCE TO OUTLET. REFER DWG No. SKC.02 FOR TYPICAL DETAIL

PROPOSED SWALE DRAIN. REFER DWG No. SKC.02 FOR TYPICAL DETAIL

DIRTY WATER CUTOFF DRAIN

DIRTY WATER CUTOFF DRAIN

EXISTING DETENTION BASIN B

UNTREATED BYPASS AREA 1.252ha

UNTREATED BYPASS AREA 1.505ha

SWALE DRAIN TO BYPASS DETENTION BASIN

CLEAN WATER CUTOFF DRAIN

GROUND D 0.332ha

PROPOSED SWALE DRAIN. REFER DWG No. SKC.02 FOR TYPICAL DETAIL

UNTREATED BYPASS AREA 1.321ha

ROAD A 2.997ha

ROOF A 1.647ha

GROUND LEVEL A 1.608ha

DIRTY WATER CUTOFF DRAIN

GROUND LEVEL B 1.839ha

ROOF B 2.145ha

ROAD B 1.904ha

EXISTING TREATMENT LAGOON

PROPOSED SWALE DRAIN. REFER DWG No. SKC.02 FOR TYPICAL DETAIL

EXISTING FACILITY TO BE SURROUNDED BY SEDIMENT FENCE

ROOF C 1.073ha

GROUND LEVEL C 4.315ha

ROAD D 0.052ha

OXLEY HIGHWAY

FOR CONTINUATION REFER DWG No. SKC.02

FOR CONTINUATION REFER DWG No. SKC.03

LEGEND

- PROPOSED BUILDING
- PROPOSED CONCRETE
- PROPOSED BARRIER KERB
- PROPOSED KERB AND CHANNEL
- PROPOSED STORM WATER MAIN
- PROPOSED TOP OF BATTER
- PROPOSED TOE OF BATTER
- PROPOSED CATCHMENT BOUNDARY
- PROPOSED SWALE DRAIN
- PROPOSED ROOF AREA
- PROPOSED HARDSTAND AREA
- PROPOSED GROUND LEVEL AREA

NOTE:
LITTER BASKETS TO BE FITTED TO FIELD INLETS LOCATED IN THE CAR PARK AREAS.

0 10 20 30 40 50
SCALE 1:1000 (A1) 1:2000 (A3)

ISSUE	DATE	AMENDMENT	BY	APP
D	15.06.20	ISSUE FOR APPROVAL	KC	MH
C	29.04.19	ISSUE FOR APPROVAL	KC	MH
B	22.01.19	ISSUE FOR APPROVAL	KC	MH
A	31.07.18	ISSUE FOR APPROVAL	ND	MH

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CLIENT: PSA CONSULTING AUSTRALIA

OAKBURN PROTEIN RECOVERY PLANT

OXLEY HIGHWAY
TAMWORTH, NSW, 2340

STORMWATER CATCHMENT PLAN STAGE 2 - SHEET 1

DESIGN: ND	DRAWN: ND	SCALES: AS SHOWN
CHKD:	APPRD:	DATE:

mpn JOB	DRAWING No.	REV
7679	SKC.01	D

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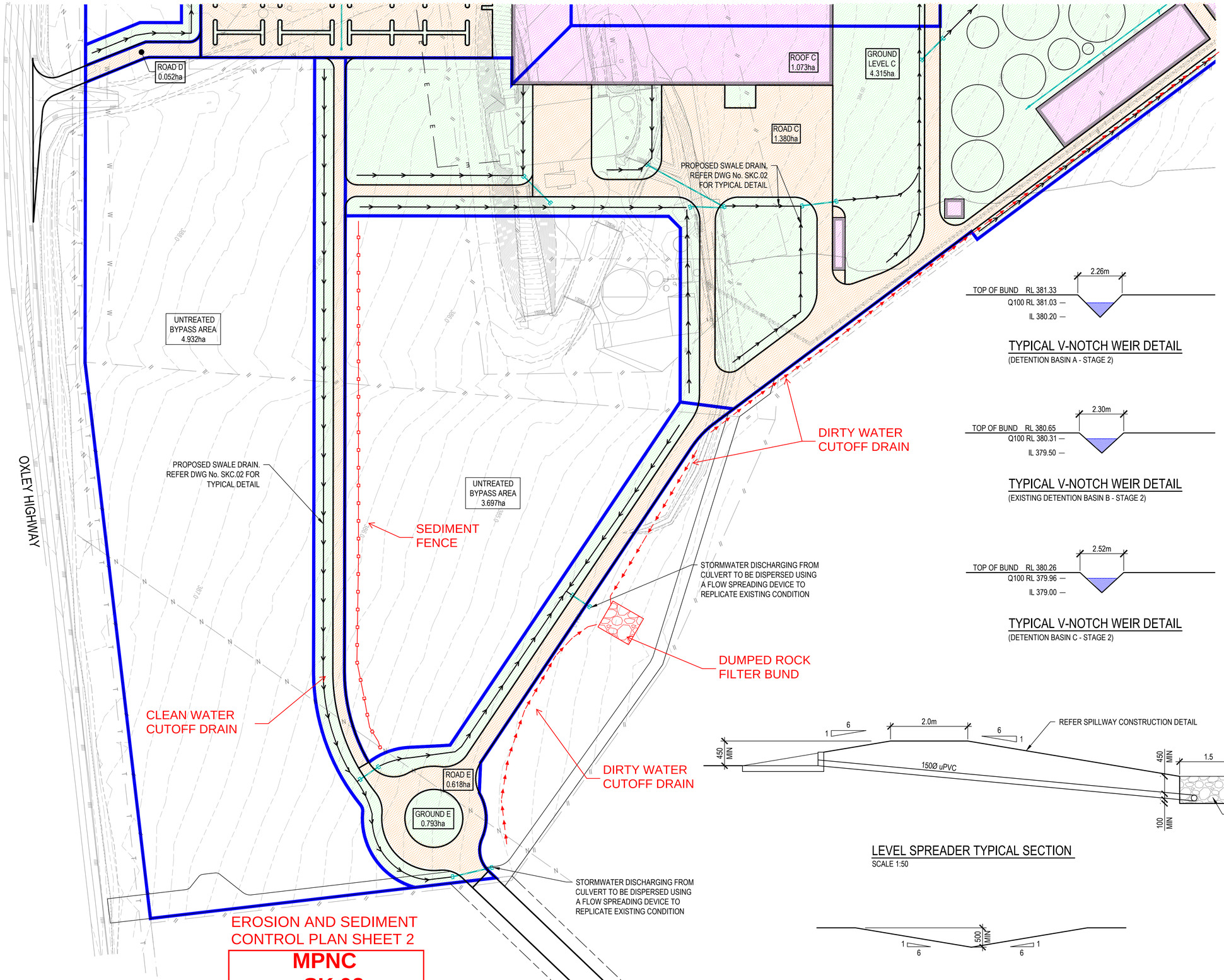
FOR CONTINUATION REFER DWG No. SKC.01



EROSION AND SEDIMENT
CONTROL PLAN SHEET 2

MPNC
SK.02
23/03/2023

LEGEND

- PROPOSED BUILDING
- PROPOSED CONCRETE
- PROPOSED BARRIER KERB
- PROPOSED KERB AND CHANNEL
- PROPOSED STORM WATER MAIN
- PROPOSED TOP OF BATTER
- PROPOSED TOE OF BATTER
- PROPOSED CATCHMENT BOUNDARY
- PROPOSED SWALE DRAIN
- PROPOSED ROOF AREA
- PROPOSED HARDSTAND AREA
- PROPOSED GROUND LEVEL AREA

TYPICAL V-NOTCH WEIR DETAIL
(DETENTION BASIN A - STAGE 2)

TYPICAL V-NOTCH WEIR DETAIL
(EXISTING DETENTION BASIN B - STAGE 2)

TYPICAL V-NOTCH WEIR DETAIL
(DETENTION BASIN C - STAGE 2)

LEVEL SPREADER TYPICAL SECTION
SCALE 1:50

SWALE DRAIN TYPICAL SECTION
SCALE 1:50

NOTE:
LITTER BASKETS TO BE FITTED TO FIELD INLETS LOCATED IN THE CAR PARK AREAS.

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SCALE 1:1000 (A1) 1:2000 (A3)

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OAKBURN PROTEIN RECOVERY PLANT

OXLEY HIGHWAY
TAMWORTH, NSW, 2340

STORMWATER CATCHMENT PLAN
STAGE 2 - SHEET 2

DESIGN: ND	DRAWN: ND	SCALES: AS SHOWN
CHKD:	APPRD:	DATE:

mpn JOB	DRAWING No.	REV
7679	SKC.02	D

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DETENTION BASIN TO BE UTILISED AS CONSTRUCTION STAGE SEDIMENT BASIN

V-NOTCH WEIR. REFER DWG No. SKC.02 FOR DETAIL

TOP OF BUND RL 381.33

PROPOSED DETENTION BASIN A (STAGE 2)

DIRTY WATER CUTOFF DRAIN

EXISTING DETENTION BASIN B

UNTREATED BYPASS AREA 1.252ha

UNTREATED BYPASS AREA 1.505ha

FOR CONTINUATION REFER DWG No. SKC.01

DIRTY WATER CUTOFF DRAIN

GROUND LEVEL B 1.839ha

ROOF B 2.145ha

ROAD B 1.904ha

GROUND LEVEL A 1.608ha

EXISTING FACILITY TO BE SURROUNDED BY SEDIMENT FENCE

ROOF C 1.073ha

GROUND LEVEL C 4.315ha

ROAD C 1.380ha

PROPOSED SWALE DRAIN. REFER DWG No. SKC.02 FOR TYPICAL DETAIL

EXISTING TREATMENT LAGOON

SEDIMENT FENCE

TOP OF BUND RL 380.26

V-NOTCH WEIR. REFER DWG No. SKC.02 FOR DETAIL

PROPOSED DETENTION BASIN C (STAGE 2)

UNTREATED BYPASS AREA 1.592ha

60m WIDE LEVEL SPREADER. 60m MIN. REFER DWG No. SKC.02 FOR TYPICAL DETAIL

DETENTION BASIN TO BE UTILISED AS CONSTRUCTION STAGE SEDIMENT BASIN

DIRTY WATER CUTOFF DRAIN

EROSION AND SEDIMENT CONTROL PLAN SHEET 3

MPNC SK.03 23/03/2023

LEGEND

- PROPOSED BUILDING
- PROPOSED CONCRETE
- PROPOSED BARRIER KERB
- PROPOSED KERB AND CHANNEL
- PROPOSED STORM WATER MAIN
- PROPOSED TOP OF BATTER
- PROPOSED TOE OF BATTER
- PROPOSED CATCHMENT BOUNDARY
- PROPOSED SWALE DRAIN
- PROPOSED ROOF AREA
- PROPOSED HARDSTAND AREA
- PROPOSED GROUND LEVEL AREA

NOTE:
LITTER BASKETS TO BE FITTED TO FIELD INLETS LOCATED IN THE CAR PARK AREAS.

0 10 20 30 40 50

SCALE 1:1000 (A1) 1:2000 (A3)

ISSUE	DATE	AMENDMENT	BY	APP
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CLIENT: PSA CONSULTING AUSTRALIA

OAKBURN PROTEIN RECOVERY PLANT

OXLEY HIGHWAY
TAMWORTH, NSW, 2340

STORMWATER CATCHMENT PLAN
STAGE 2 - SHEET 3

DESIGN: ND	DRAWN: ND	SCALES: AS SHOWN
CHKD:	APPRD:	DATE:

mpn JOB	DRAWING No.	REV
7679	SKC.03	D

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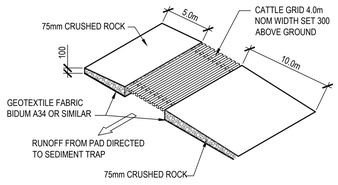
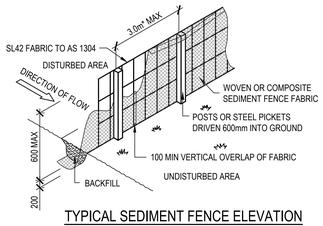


TYPICAL TEMPORARY CONSTRUCTION ENTRY / EXIT DETAIL

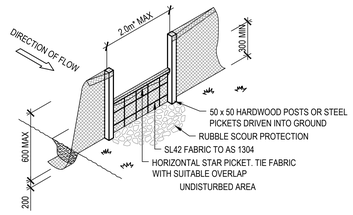
N.T.S.



TYPICAL SEDIMENT FENCE ELEVATION

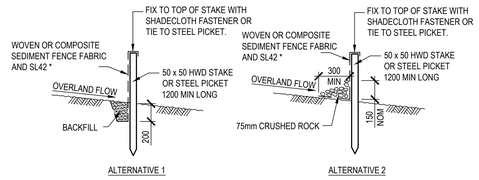
* 2000 MAX WITH OUT SL42 MESH

N.T.S.



TYPICAL SEDIMENT FENCE SPILL THROUGH

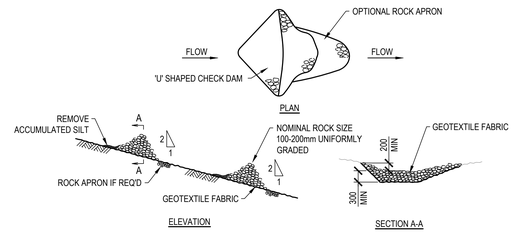
N.T.S.



TYPICAL SEDIMENT FENCE SECTIONS

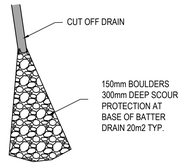
N.T.S.

* MAX SPACING OF POSTS 2.0m WITHOUT SL42
AND 3.0m WITH SL42



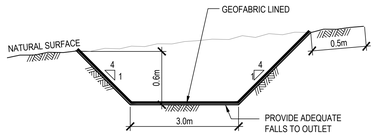
TYPICAL CHECK DAM FLOW CONTROL

N.T.S.



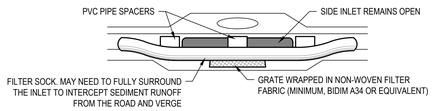
TYPICAL SCOUR PROTECTION
END OF CUT OFF DRAINS

N.T.S.



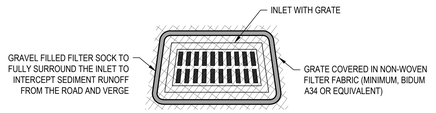
TYPICAL DIRTY WATER CUT OFF DRAIN

N.T.S.



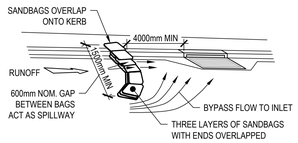
TYPICAL SAG INLET SEDIMENT TRAP.

N.T.S.



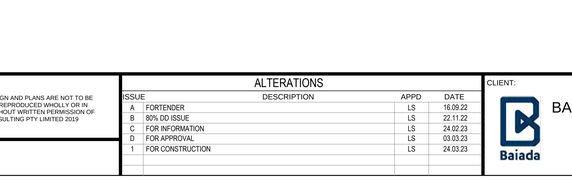
TYPICAL FIELD INLET SEDIMENT TRAP.

N.T.S.



TYPICAL ON GRADE KERB INLET SEDIMENT TRAP

N.T.S.



TYPICAL MULCH BUND

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ALTERATIONS

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DESIGNED	KC
DESIGN CHECKED	KC
DRAWN	VL
DRAWING CHECK	KC
APPROVED:	LS
JOB NUMBER: 8758	RPEQ.

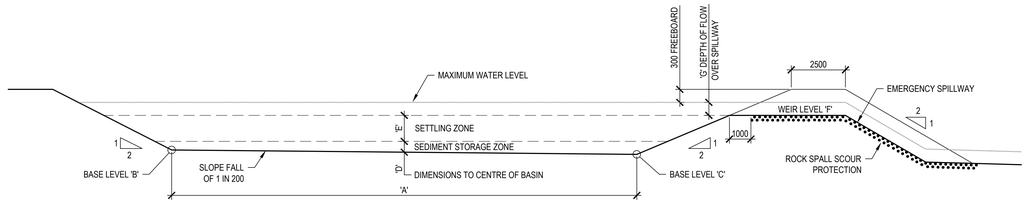
SHEET NAME: EROSION AND SEDIMENT CONTRL DETAILS SHEET 1

PROJECT: OAKBURN POULTRY PROCESSING FACILITY
TAMWORTH, NSW 2340

PROJECT NUMBER: A502

DRAWING NUMBER: A502-EW-MP-CV-DRG-SW-1201

ISSUE: 1

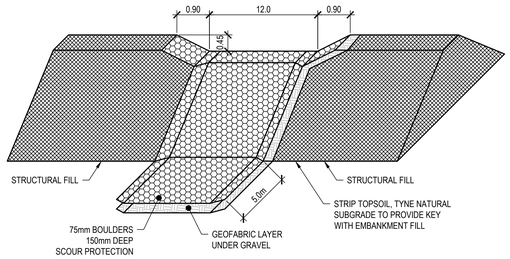


TYPICAL SECTION SEDIMENT BASIN

N.T.S.

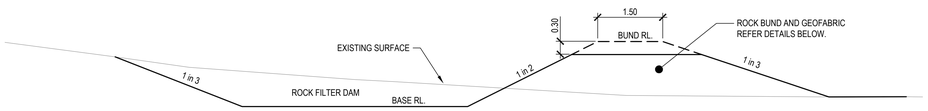
SEDIMENTATION BASIN TABLE

BASIN No.	BASE LENGTH (m) 'A'	BASE WIDTH (m)	BASE LEVEL 'B'	BASE LEVEL 'C'	STORAGE DEPTH (m) 'D'	SETTLING DEPTH (m) 'E'	WEIR WIDTH (m)	WEIR LEVEL 'F'	WEIR DEPTH (m) 'G'
1	75	15	379.188	378.812	0.30	0.60	12.0	379.90	0.15
2	70	14	379.288	378.912	0.30	0.60	12.0	380.00	0.15



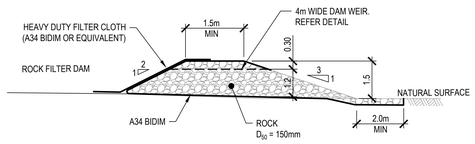
TYPICAL SEDIMENT BASIN EMERGENCY SPILLWAY DETAIL

N.T.S.



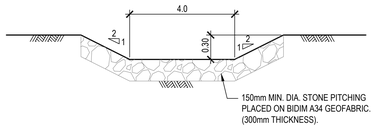
TYPICAL SECTION ROCK DAM THROUGH OVERFLOW WEIR

SCALE 1:50



ROCK BUND AND GEOFABRIC FILTER DETAILS

N.T.S.



TYPICAL SECTION - ROCK DAM WEIR

N.T.S.

FOR CONSTRUCTION

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ALTERATIONS

ISSUE	DESCRIPTION	APPD	DATE
A	FOR TENDER	LS	16.09.22
B	FOR TENDER	LS	26.09.22
C	80% DD ISSUE	LS	22.11.22
1	FOR CONSTRUCTION	LS	24.03.23

CLIENT: BAIADA POULTRY

MANAGING CONTRACTOR: BESIX Watpac

CONSULTANT: mpn consulting
ABN: 39 062 191 799
39 Sherwood Road, Toowong, Qld, 4066
P: 61 7 3335 4555
E: solutions@mpnc.net.au

JOB NUMBER: 8758

DESIGNED	KC
DESIGN CHECKED	KC
DRAWN	VL
DRAWING CHECK	KC
APPROVED:	LS
RPEQ.	

SHEET NAME: EROSION AND SEDIMENT CONTRL DETAILS SHEET 2

PROJECT: OAKBURN POULTRY PROCESSING FACILITY
TAMWORTH, NSW 2340

PROJECT NUMBER: A502

DRAWING NUMBER: A502-EW-MP-CV-DRG-SW-1202

ISSUE: 1

10 APPENDIX A – ENVIRONMENTAL RISK ASSESSMENT

RICHARD CROOKES CONSTRUCTIONS

APPENDIX A - ENVIRONMENTAL RISK ASSESSMENT

PROJECT:	Baiada - Oakburn Poultry Processing Plant
PROJECT #:	1310

LEGEND	LIKELIHOOD		CONSEQUENCE	
	Almost certain	a	Insignificant	1
	Likely	l	Minor	2
	Moderate	m	Moderate	3
	Unlikely	u	Major	4
	Rare	r	Catastrophic	5

RISK MATRIX					
LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	a1	a2	a3	a4	a5
Likely	l1	l2	l3	l4	l5
Moderate	m1	m2	m3	m4	m5
Unlikely	u1	u2	u3	u4	u5
Rare	r1	r2	r3	r4	r5

RISK RATING ALLOCATION					
LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	2	2	1	1	1
Likely	2	2	2	1	1
Moderate	3	2	2	1	1
Unlikely	3	3	2	2	1
Rare	3	3	2	2	2

RCC OBJECTIVES AND TARGETS / KPIS:
<3 Environmental Notices issued by EPA or Local Council annually
Action community complaints within 24 hours, no repeat complaints for same issue
Investigate non effective operational controls / environmental incidents and report

Environmental Aspect - also consider if any legislation applies to activity or environmental aspect.

Activity, Product or Service Strike out non relevant items	Assessment of Significant Environmental Impact (no controls)	1 Dust	2 Odour	3 Greenhouse	4 Stormwater	5 Adjoining waterways	6 Sewer	7 Land	8 Resources/water	9 Resources/materials	10 Resources/energy	11 Noise	12 Vibration	13 Community concerns	14 Flora	15 Fauna	16 Waste / chemcials	17 Landfilling	18 Litter	19 Traffic	20 Aboriginal heritage	21 European heritage	Impact - No Controls.
Site Set Up	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 5. pollution of ecosystems 6. pollution of aquatic ecosystem 14. loss of habitat 15. loss of threatened species/protected species 19. community disturbance, mud tracking on public roads 21. loss of cultural artefacts, buildings, structures 11. community disturbance 12. human discomfort, damage to buildings 13. stakeholder interactions 16. non efficent use of materials, chemical pollution
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Demolition	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 11. community disturbance 12. human discomfort, damage to buildings 13. stakeholder interactions 16. non efficent use of materials, chemical pollution 18. visual amenity, pollution 19. community disturbance, mud tracking on public roads 21. loss of cultural artefacts, buildings, structures
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Hazardous Materials Removal - Asbestos, Lead Paint, SMF	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 13. stakeholder interactions 16. non efficent use of materials, chemical pollution 18. visual amenity, pollution 21. loss of cultural artefacts, buildings, structures
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Site Stripping & Bulk Earthworks, Transport of spoil, Importation of fill	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 5. pollution of ecosystems 11. community disturbance 12. human discomfort, damage to buildings 13. stakeholder interactions 14. loss of habitat 15. loss of threatened species/protected species 19. community disturbance, mud tracking on public roads 21. loss of cultural artefacts, buildings, structures
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Remediation	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 5. pollution of ecosystems 11. community disturbance 12. human discomfort, damage to buildings 13. stakeholder interactions 16. non efficent use of materials, chemical pollution 19. community disturbance, mud tracking on public roads 20. loss of cultural artefacts 21. loss of cultural artefacts, buildings, structures
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Dewatering	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 5. pollution of ecosystems 6. pollution of aquatic ecosystem
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Detailed excavation / In ground Services	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 5. pollution of ecosystems 11. community disturbance 16. non efficent use of materials, chemical pollution
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Foundations - piering / anchors	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 11. community disturbance 12. human discomfort, damage to buildings 13. stakeholder interactions
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Foundations - piling	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 4. pollution of aquatic ecosystem 5. pollution of ecosystems 11. community disturbance 12. human discomfort, damage to buildings 13. stakeholder interactions 16. non efficent use of materials, chemical pollution
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Structure - formwork, reinforcement, concrete & curing, post tensioning	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	4. pollution of aquatic ecosystem 5. pollution of ecosystems 11. community disturbance 12. human discomfort, damage to buildings 19. community disturbance, mud tracking on public roads
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
Wet trades: Blockwork, brickwork, render, waterproof membranes	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	4. pollution of aquatic ecosystem 16. non efficent use of materials, chemical pollution 21. loss of cultural artefacts, buildings, structures
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	
	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 18. visual amenity, pollution

EXAMPLE

RICHARD CROOKES CONSTRUCTIONS

APPENDIX A - ENVIRONMENTAL RISK ASSESSMENT

PROJECT:	Baiada - Oakburn Poultry Processing Plant
PROJECT #:	1310

LEGEND	LIKELIHOOD		CONSEQUENCE	
	Almost certain	a	Insignificant	1
	Likely	l	Minor	2
	Moderate	m	Moderate	3
	Unlikely	u	Major	4
	Rare	r	Catastrophic	5

RISK MATRIX					
LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	a1	a2	a3	a4	a5
Likely	l1	l2	l3	l4	l5
Moderate	m1	m2	m3	m4	m5
Unlikely	u1	u2	u3	u4	u5
Rare	r1	r2	r3	r4	r5

RISK RATING ALLOCATION					
LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	2	2	1	1	1
Likely	2	2	2	1	1
Moderate	3	2	2	1	1
Unlikely	3	3	2	2	1
Rare	3	3	2	2	2

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Activity, Product or Service Strike out non relevant items	Assessment of Significant Environmental Impact (no controls)	1 Dust	2 Odour	3 Greenhouse	4 Stormwater	5 Adjoining waterways	6 Sewer	7 Land	8 Resources/water	9 Resources/materials	10 Resources/energy	11 Noise	12 Vibration	13 Community concerns	14 Flora	15 Fauna	16 Waste / chemcials	17 Landfilling	18 Litter	19 Traffic	20 Aboriginal heritage	21 European heritage	Impact - No Controls.
Services - hydraulic, electrical, mechanical, incl. cable chasing, concrete coring	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	4. pollution of aquatic ecosystem 11. community disturbance 16. non efficent use of materials, chemical pollution 21. loss of cultural artefacts, buildings, structures
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	**Y**	**N**	**N**	**Y**	**Y**	**Y**	**N**	**N**	**N**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	
Roofing	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	11. community disturbance 16. non efficent use of materials, chemical pollution 18. visual amenity, pollution
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	**Y**	**N**	**N**	**Y**	**Y**	**Y**	**N**	**N**	**N**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	
Finishes - **Internal:** partitions, ceilings, joinery, door hanging **Wet trades:** Gyprocking, painting, tiling, floor finishes,	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	11. community disturbance 12. human discomfort, damage to buildings 16. non efficent use of materials, chemical pollution 18. visual amenity, pollution
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	
	Applicable y=yes, n=no	**Y**	**N**	**N**	**Y**	**Y**	**Y**	**N**	**N**	**N**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	
External works - pavements, landscaping, lighting	Likelihood	l	u	u	m	m	m	u	u	r	r	m	m	m	m	m	l	u	l	l	r	r	1. photochemical smog, visual amenity 11. community disturbance
	Consequence	2	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	3	3	3	3	4. pollution of aquatic ecosystem 12. human discomfort, damage to buildings 19. community disturbance, mud tracking on public roads
	Risk Rating	2	3	3	2	2	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2	2	5. pollution of ecosystems 14. loss of habitat 16. non efficent use of materials, chemical pollution 21. loss of cultural artefacts, buildings, structures
	Applicable y=yes, n=no	**Y**	**N**	**N**	**Y**	**Y**	**Y**	**N**	**N**	**N**	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**	**Y**	

EXAMPLE

Appendix A1 - Environmental Actions and Monitoring Table

RICHARD CROOKES CONSTRUCTIONS

Environmental Aspect (to be read in conjunction with, Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp
			Induction and/or toolbox	RCC	Subcont. SWMS & contracts	Consult reports	Visual	**Form 18.3** Environmental Inspection Checklist	**Form 40.2** SWMS Compliance	**Form 31.1** NCR/ Site Notice	Check records during audit	
1	Dust Generation Particulate Emissions (General)	• Install shade cloth on perimeter fencing • Vehicle corridors will be clearly identified and restricted to control vehicle access onsite. • Limit vehicle speed onsite to 20km/hr • Fixed and mobile (water tanker) water sprays • Reduce work activities /stop work during moderate to high wind velocity periods. • Maintain equipment. Smokey plant to be stopped until repair works completed. • Turn off vehicle engines whilst not in use (no long periods of idling)	✓	✓	✓		Daily	Weekly		As required		SS
1	Dust Generation (Demolition)	• Breakers and crushing equipment to be fitted with dust filtration equipment or water sprays to control dust emissions.			✓		Daily	Weekly during works	✓	As required		SS
1	Dust Generation (Construction)	• Minimise areas of site disturbed and stage works where possible. • Dust suppression strategies to be used, i.e. water sprays, soil binders, hydromulching, controlled speed onsite, roadbase + shaker grids. • Stockpiled topsoils and rubble will be restricted to 4m high. Stabilise if insitu for >4-6months. • On site drilling or coring operations will be undertaken by equipment fitted with air filtration equipment.	✓	✓			Daily	Weekly		As required		SS

EXAMPLE

APPENDIX A1 - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
2	Odour	• If odorous materials uncovered, recover immediately. • Seek advice from consultant regarding soil /materials management.		✓		✓	Daily	Weekly		As required		SS
3	Stormwater (Discharge from sedimentation basins, flooding)	• Water quality to meet ANZECC Water Quality Guidelines. → Conduct water quality test (external test company) NTU and TSS to determine the best treatment and acceptable levels – (Generally) PH 6.5- 8.5, Turbidity <50NTU, No visible oil & grease • Obtain advice for use of flocculants to settle sediment from water. • Sedimentation pond to be maintained at low levels to ensure capacity during rainfall event. • DO NOT DISCHARGE IF CONTAMINANTS SUSPECTED. Obtain advice.	✓	EP-001		✓	Daily during discharge	Weekly		As required	✓	SS
4	Adjoining waterways (dewatering, soil erosion & runoff)	• Temporary drainage systems will be established to divert clean waters around the land development areas as appropriate. • Erect silt fences, bunds and construct swale drains. • Concrete Bunded washouts plastic lined • Inspect at least weekly & after rainfall.		EP-001		✓	Daily during discharge	Weekly		As required	✓	SS

EXAMPLE

APPENDIX A1 - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
5	Adjoining waterways (dewatering, soil erosion & runoff)	• Maintain and/or replace as required. • Refer NSW Department of Housing's Managing Urban Stormwater (2004). • Street sweepers will be employed on regular basis.										
6	Sewer (Trade waste)	• No paints or other chemical to be poured down drains. • If required, obtain trade waste licence for discharge or local council approval.		EP-001		✓				As required	✓	SS
7	Land (Acid sulphate soils, contaminated soils, imported fill)	• Stop work if unexpected potentially contaminated soils are encountered. • Obtain waste classification from consultant in accordance with EPA guidelines Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes (June 2004) www.environment.nsw.gov.au/waste/envguidlns/index.htm.	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS
9	Noise	• Refer to DA for noise restrictions and working hours. • Situate generators and plant away from sensitive receivers. • Turn off machinery. Maintain equipment and stop noisy plant until repaired. • No early deliveries.	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS

EXAMPLE

APPENDIX A1 - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
10	Vibration	• Conduct dilapidation report prior to work starting. • Limit the use of vibratory rollers, rock breakers, impact piling etc adjacent to buildings (>7m). • Regenerated noise may also transfer through bedrock and building structures. • Obtain advice if required.	✓		✓	✓	Daily	Weekly	✓	As required	✓	SS
11	Community Concerns	• Provide information (eg. Signage, letterbox drops) to community on programmed works • Provide contact name for inquires. • Advice locals of “noisy” work. • If required in noise sensitive areas and/or in response to complaints, engage consultants to undertake monitoring at nominated receivers. • Vehicles will not be permitted to queue outside the site or in residential areas unless a defined area is established which does not adversely impact on neighbours.	✓				Daily	Weekly		As required		PM SS

EXAMPLE

APPENDIX A1 - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
12	Flora	• Review planning documentation to determine the presence of any protected, threatened or significant flora. Obtain approvals as required. • Education and training at site toolbox meetings and induction. • Report all sightings to the site manager. • Fence or barricade protected flora at the drip zone. Erect Keep Out signage. • Do not stack materials under/against trees. • The potential for reuse of vegetative wastes by mulching, chipping or on-site placement of trunks or limbs shall be reviewed for each project.	✓	✓		✓	Daily	Weekly		As required	✓	SS
13	Fauna	• All native animals protected. • Review planning documentation to determine the presence of any protected, threatened or significant fauna. Obtain approvals as required. • Site rules/induction to include information regarding of the • For injured animals, to relocate call WIRES	✓	✓		✓	Daily	Weekly	✓	As required	✓	SS

EXAMPLE

APPENDIX A1 - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
14	Waste Litter	• Hazardous materials surveys to be completed. • Materials to be removed prior to demolition • Registers and waste disposal requirements as per WorkCover and EPA requirements for removal, storage, transport and disposal. • General site wastes –use one bin system and sort in contractors yard to produce quantities of material for recycling, reuse, disposal etc. • Empty drums are to be taken off-site for disposal. • Empty drums shall be crushed prior to recycling/disposal. • Do not overfill skip bins. Provide plenty for use. Cover where potential for windblown litter.	✓	EP-002	✓	✓	Daily	Weekly	✓	As required	✓	SS
16	Landfilling	• Reduce, reuse and then dispose • Landfill space scare leading to increased tipping costs • Dispose of hard construction wastes for recycled gravels and sands • Do not send soil to landfill until alternatives for beneficial reuse have been explored as per consultants advice. • Consideration should be given to chipping of the vegetation and reuse • Reuse packaging to protect works		EP-002			Daily	Weekly		As required	✓	SS

EXAMPLE

APPENDIX A1 - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
17	Chemicals	• Chemicals to be stored in bunded areas (impervious + 110% of largest container) away from stormwater drains & pits. • Refer Workcover Code of Practice for Storage & Handling of Dangerous Goods, EPA Guidelines for Bunding & Spill Management. Appropriate chemicals storage is in conformance with: → AS 1940 The Storage and Handling of Flammable and Combustible Liquids → Storage and Handling of Dangerous Goods WorkCover Code of Practice 2005– refer p. 86 • EPA requirements http://www.environment.nsw.gov.au/mao/bundingspill.htm • Ponded water within bunds will not be discharged to stormwater. • Fuel and hydraulic leaks to be cleaned up immediately. • Drilling muds to be contained within bunds and reused. • Construct concrete washout pit for washout, away from stormwater drains. Send back to batch plant where possible.	✓	EP-002 EP-005 EP-006	✓		Daily	Weekly	✓	As required		SS

EXAMPLE

APPENDIX A1 - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
	Chemicals	• Concrete cuttings to be contained and wetvac to prevent runoff into stormwater drains. • Storage of bulk fuels (>200L) on site is prohibited. All refuelling shall be undertaken by a mobile facility with appropriate spill control and containment control equipment. • MSDS's must be provided to the Site supervisor prior to a chemical being received on site and by subcontractors using chemicals/products.	✓	EP-002 EP-005 EP-006	✓		Daily	Weekly	✓	As required		SS
18	Traffic	• Develop and implement traffic management plans. Submit to local council as required. • Signage and notices regarding disruptions. • Use crushed concrete, mulches etc along site access roads. • Install shakers and wheel wash as required. • Organise regular street sweeping. • Haulage routes and rules will be provided to subcontractors prior to commencing on site. • All loads of soil, demolition wastes, general wastes etc are to be tarped.	✓	TMPs		✓	Daily	Weekly		As required		SS

EXAMPLE

APPENDIX A1 - ENVIRONMENTAL ACTIONS AND MONITORING TABLE

Environmental Aspect (to be read in conjunction with Environmental Risk Matrix)		Environmental Actions, Controls and Criteria	Operational Controls				Effectiveness of Controls			Checking, Corrective & Preventative Action		Resp.
19	Aboriginal heritage	• Education and training at site toolbox meetings and induction. • It is illegal to destroy heritage items. • Review local or regional environmental plans, or on the State Heritage Register is to be consulted prior to work starting onsite. • Any heritage relics or sites discovered during construction shall be reported to the NSW Heritage Office. • Work in the subject area to cease until specialist advice is obtained. • The area will be fenced and signs erected to restrict access. • Heritage consultants may be required to provide advice on demolition/construction processes and finishes.	✓	✓		✓	Daily	Weekly		As required	✓	SS
	Emergency Preparedness:	• Spill kit onsite. • Refer to the MSDS for advice and procedures. • All spills must be reported to the FM & cleaned up. Complete RCC Accident /Incident report. • Sed pond pumped out regularly to maintain capacity in case of emergency • Ensure you know where stormwater drains are and have materials to block them in case of a fire.	✓	✓			Daily	Weekly		As required		SS

EXAMPLE

11 APPENDIX B – ENVIRONMENTAL INSPECTION CHECKLIST

Inspection Details - 18.3 Environmental Inspection

Inspection Status	Location	Description
In Progress		BAIADA OPP

Subcontractor Details

Subcontractor
Richard Crookes Constructions Pty Limited

Attendees

Name	Company	Position	Signature
Paul Sniekers	Richard Crookes Constructions	Senior Contracts Administrator	

Checklists

Environmental Safeguard

Is this inspection as a result of a rain event?	◯ Yes	◯ No	
Have RCC staff been briefed in the requirements and responsibility of ENV of the PMP (EMP)?	◯ Yes	◯ No	
Have key subcontractors been briefed on project environmental issues and their responsibilities as part of the daily pre-start?	◯ Yes	◯ No	
Have you held/distributed any environmental based tool box talks?	◯ Yes	◯ No	◯ N/A
Have you received complaints, have they been recorded (F 18.5) and a response provided to complainant this week?	◯ Yes	◯ No	◯ N/A
Are retained trees fenced, and the drip zone free of stored materials, parked cars etc	◯ Yes	◯ No	◯ N/A
Are stockpiles battered and contained by a silt fence, away from waterways?	◯ Yes	◯ No	◯ N/A

EXAMPLE

Have you checked the silt fences, other sediment control measures?	Yes	No	N/A
Do they require maintenance?	Yes	No	
Have silt fences been installed around constructed drainage pits / or are they covered with geofabric?	Yes	No	N/A
Has refuelling been undertaken by mobile refuelling providers?	Yes	No	N/A
Has there been any dust management issues?	Yes	No	
If yes, how were they rectified?			
Has work been undertaken within approved operating hours?	Yes	No	
Have you had excessive noise or vibration levels from equipment? Consider heritage structures, residents	Yes	No	
Have trucks leaving site carting spoil, demolition wastes, general wastes etc been tarped?	Yes	No	N/A
Are project entries/exits adequate ballast or grid in working order	Yes	No	N/A
Are roads / gutters clean socks in good order	Yes	No	
Are chemicals / fuels stored in a bunded, roofed and secure area? (not a shipping container)	Yes	No	N/A
Are concrete wastes/washouts contained?	Yes	No	N/A
Is a paint wash up system established?	Yes	No	N/A
Are there enough bins onsite? Does litter require tidying up inside/outside the site	Yes	No	
Have you or the subcontractor tracked waste off site (F 18.4)?.	Yes	No	

EXAMPLE

Do you have all the waste dockets, completed the waste register (F 18.1) and the monthly waste reports from the contractor?	○ Yes	○ No	
Do you have records for any imported fill?	○ Yes	○ No	○ N/A
Do weeds need spraying or grass cutting? Do you need a licenced contractor?	○ Yes	○ No	○ N/A
Are there enough spill kits onsite and are they fully stocked?	○ Yes	○ No	
Have heritage requirements been complied with?	○ Yes	○ No	○ N/A
Did you have to stop any works due to rain, high winds, noise or vibration, traffic issues?	○ Yes	○ No	
Note site specific items			
Attach any photo evidence as required to this Inspection			

Other Observations

Ref	Classification	Responsible	Priority	Due Date	Date Closed

Outcomes

Metric	Count	%
Negative Observations	0	0%
Positive Observations	0	0%
Open Observations	0	0%
Closed Observations	0	0%
Yes	0	0%
No	0	0%
N/A	0	0%

EXAMPLE

12 APPENDIX C – CONSTRUCTION NOISE MANAGEMENT PLAN

Oakburn Poultry Processing Facility

Construction Noise and Vibration Management Plan

Richard Crookes Construction
Suite 1, Level 1,118a Belford Street
Broadmeadow NSW 2292

Report Reference: 230073 – Oakburn Poultry Processing Facility – Construction Noise and Vibration Management Plan – R3
Date: 20 April 2023

Revision: R3

Project Number: 230073

PULSE WHITE NOISE ACOUSTICS Level 5, 73 Miller Street, North Sydney NSW 2060
P 1800 4 PULSE (1800 478 573) **E** info@pwna.com.au **pwna.com.au** ABN 95 642 886 306

21 June 2023

Paul Sniekers
Contracts Manager

Suite 1, Level 1
118a Belford Street
Broadmeadow NSW 2292

Dear Paul,

Oakburn Poultry Processing Facility – Construction Noise and Vibration Management Plan

Pulse White Noise Acoustics (PWNA) has prepared a Construction Noise and Vibration Management Plan for the Oakburn Poultry Processing Facility (ref 230073 – Oakburn Poultry Processing Facility – Construction Noise and Vibration Management Plan – R3, dated 20 April 2023). This plan has been prepared in accordance with the projects Development Consent Conditions (SSD-9394), dated 18/12/2020.

Specifically, the Construction Noise and Vibration Management Plan has addressed Condition C1:

Management Plan Requirements

C1. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:

a) detailed baseline data;
b) details of:
   i. the relevant statutory requirements (including any relevant approval, licence or lease conditions);
   ii. any relevant limits or performance measures and criteria; and
   iii. the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;
d) a program to monitor and report on the:
   i. impacts and environmental performance of the development;
   ii. effectiveness of the management measures set out pursuant to paragraph (c) above;
e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;
f) a program to investigate and implement ways to improve the environmental performance of the development over time;
g) a protocol for managing and reporting any:
   i. incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);
   ii. complaint;
   iii. failure to comply with statutory requirements; and
h) a protocol for periodic review of the plan

I trust that this provides sufficient information for your current requirements. If you have any further queries or concerns, please do not hesitate to contact me.

Michael Allan
Technical Director

DOCUMENT CONTROL

Project Name:	Oakburn Poultry Processing Facility
Project Number:	230073
Report Reference:	230073 – Oakburn Poultry Processing Facility – Construction Noise and Vibration Management Plan – R3
Client:	Richard Crookes Construction

Revision	Description	Reference	Date	Prepared	Checked	Authorised
1	Revision 0	For client review	03/03/23	MA	BW	BW
2	Revision 1	Final	07/03/23	MA	BW	BW
3	Revision 2	Final	09/03/23	MA	BW	BW
4	Revision 3	Final	20/04/23	MA	BW	BW

PREPARED BY:

Pulse White Noise Acoustics Pty Ltd
ABN: 95 642 886 306
Address: Level 5, 73 Miller Street, North Sydney, 2060
Phone: 1800 4 PULSE

This report has been prepared by Pulse White Noise Acoustics Pty Ltd
with all reasonable skill, care and diligence, and taking account of the
timescale and resources allocated to it by agreement with Richard Crookes Construction.

Information reported herein is based on the interpretation of data collected,
which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Richard Crookes Construction
No warranties or guarantees are expressed or should be inferred by any third parties.
This report may not be relied upon by other parties without written consent from Pulse White Noise Acoustics.

This report remains the property of Pulse White Noise Acoustics Pty Ltd
until paid for in full by the client, Richard Crookes Construction.

Pulse White Noise Acoustics disclaims any responsibility to the Client and others
in respect of any matters outside the agreed scope of the work.

CONTENTS

Figures

Tables

1 INTRODUCTION

Pulse White Noise Acoustics (PWNA) have been engaged to prepare a Construction Noise and Vibration Management Plan for the construction of the Oakburn Poultry Processing Facility at Westdale, NSW.

The site is located on the Oxley Highway at Westdale, north-west of Tamworth. The site is predominantly surrounded by industrial uses including Tamworth airport, with residential receivers sparsely located to the north-west, north, and east.

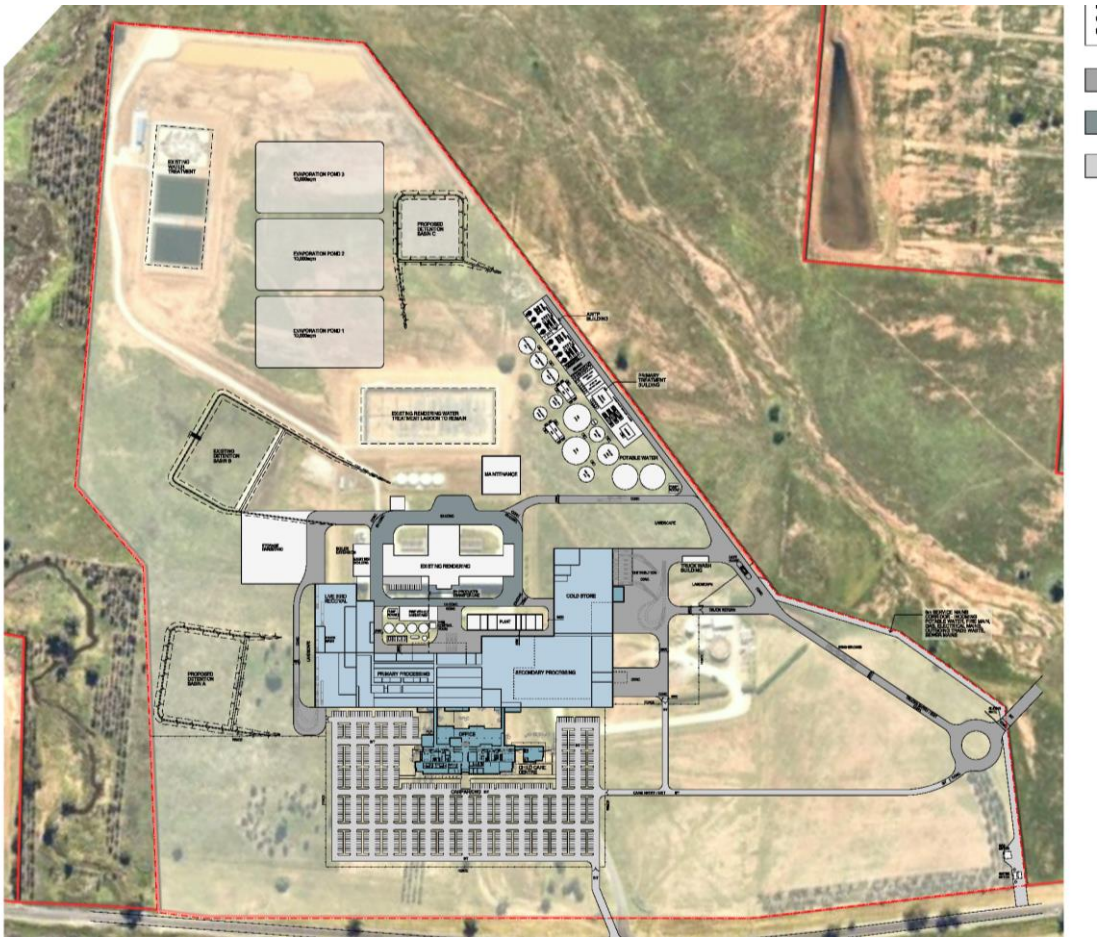


Figure 1 Oakburn Poultry Processing Facility Site Plan

1.1 Project description

The project involves the demolition and clearing of the existing site, and an erection of a new processing facility. The construction works covered by this plan include:

Early Works

- new access road including the extension of the public road known as Workshop Lane including associated services
- bulk earthworks to form building platforms, carparks and related Main Works' areas
- relocation and / or diversion of services
- gatehouse precinct - building and weighbridges

Main works

- all new buildings - main processing, administration office, maintenance and plant
- buildings and associated service sand fit-out
- infrastructure services
- remaining hardstand areas and access roads
- landscaping and car park areas

Program

Presented below is a summary of the indicative construction timeline.

- **Early works** - commence on site April / May 2023 and completion end 2023
- **Main works** - commence on site late 2023 and completion mid / late 2025

1.2 State Significant Development Application

The facility State Significant Development (SSD) application (SSD-9394) was granted development consent on 18 December 2020, with conditions. Presented below in Table 1 is a summary of the construction noise and vibration conditions which apply to these works. The location in the report where the condition has been addressed is also included.

Table 1 SSD-9394 Conditions

<table>
<tr><th>Condition</th><th>Details</th><th>Location addressed</th></tr>
<tr><td colspan="3">Hours of Work</td></tr>
<tr><td>B1</td><td>The Applicant must comply with the hours detailed in Table 1.
Table 1: Hours of work
<table>
<tr><th>Activity</th><th>Day</th><th>Time</th></tr>
<tr><td>Earthworks and construction</td><td>Monday – Friday
Saturday</td><td>7am to 6pm
8am to 1pm</td></tr>
</table></td><td>Section 4.2</td></tr>
<tr><td>B2</td><td>Works outside of the hours identified in condition B1 may be undertaken in the following circumstances:
a) works that are inaudible at the nearest sensitive receivers; or
b) works agreed to in writing by the Planning Secretary; or
c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
d) where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.</td><td>Section 4.2</td></tr>
<tr><td colspan="3">Construction Noise Limits</td></tr>
<tr><td>B3</td><td>The development must be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009) (as may be updated or replaced from time to time). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures in the Appendix 3.</td><td>Section 3.1, Section 5</td></tr>
</table>

Condition	Details	Location addressed
Construction Noise Management Plan		
B4	The Applicant must prepare a Construction Noise Management Plan for the development to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with condition C2 and must a) be prepared by a suitably qualified and experienced noise expert whose appointment has been endorsed by the Planning Secretary; b) be approved by the Planning Secretary prior to the commencement of construction of the project c) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009) (as may be updated or replaced from time to time); d) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers; e) include a complaints management system that would be implemented for the duration of the development.	This report, Section 5, and Section 6
B5	The Applicant must: a) not commence construction of any relevant stage of the project until the Construction Noise Management Plan required by condition B4 is approved by the Planning Secretary; and b) implement the most recent version of the Construction Noise Management Plan approved by the Planning Secretary for the duration of construction	

2 EXISTING ENVIRONMENT

2.1 Sensitive receiver locations

Presented below in Figure 2 is a site plan illustrating the nearest sensitive reciever locaiton. The sensitive receivers are:

- R1 – Old Winton Road, residential receiver approximatley 1.6km west of the site
- R2 – Bowlers Road, residential receiver approximately 700m north of the site
- R3 – 532 Wallamore Road, residential approximately 1.6 km east of the site

Figure 2 Sensitive receiver locations

2.2 Ambient noise monitoring

The site location is on the north side of the Oxley Highway, north of Tamworth Airport. While there are noise generating industries in the area, the background noise levels are representative of a rural environment.

Background noise logging was previously undertaken by Reverb Acoustics in 2007. While this data is considered quite old, given the rural use of the area, noise levels are unlikely to have changed significantly in the area. The noise measurements are considered representative of the area. This approach is consistent with the SSD noise impact assessment, and meets the requirements of the SSD development consent conditions.

Based on the unattended noise measurements, the results of the survey have been presented below.

The Rating Background Noise Level (RBL) is the background noise level used for assessment purposes at the nearest potentially affected receiver. It is the 90th percentile of the daily background noise levels during each assessment period, being day, evening and night. RBL $L_{A90\ (15minute)}$ and L_{Aeq} noise levels are presented in Table 2.

Table 2 Measured ambient noise levels

Measurement Location	Daytime[1] 7:00 am to 6:00 pm		Evening[1] 6:00 pm to 10:00 pm		Night-time[1] 10:00 pm to 7:00 am	
	LA90[2] (dBA)	LAeq[3] (dBA)	LA90[2] (dBA)	LAeq[3] (dBA)	LA90[2] (dBA)	LAeq[3] (dBA)
Logger location 1	31	57	25	53	21	50
Logger location 2	30	52	29	46	26	46

Note 1 For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am

Note 2 The L_{A90} noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

Note 3 The L_{Aeq} is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

3 ASSESSMENT CRITERIA

3.1 Construction noise criteria

The EPA's Interim Construction Noise Guideline (ICNG) provides guidance on appropriate construction noise management levels that should be adhered to on construction projects throughout NSW. This guideline identifies that potential impacts from construction noise is determined based on time of day of the noise, the increase in noise above background noise, the duration of the event, and any adverse characteristics of the noise

The ICNG prevents assessment procedures for the assessment of noise impacts, and management and mitigation measures procedures to address potential impacts on sensitive receivers. The main objectives of the ICNG are:

- Promote a clear understanding of ways to identify and minimise noise from construction works,
- Focus on applying all feasible and reasonable work practices to minimise construction noise impacts,
- Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours,
- Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage; and
- Provide flexibility in selecting site-specific feasible and reasonable work practices to minimise noise impacts.

The ICNG identifies a quantitative assessment approach which is applicable to this project. The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with site specific Noise Management Levels (NMLs). The NML affectation categories for receivers have been reproduced from the guideline and are listed in the table below.

Table 3 Construction noise management levels – residential receivers

Receiver type	Time of day	Noise management level $L_{Aeq(15minute)}$[1,2]	How to apply
Residential	Approved working hours of the project, including: Monday- Friday 7am-5pm and Saturday 8am-5pm	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
		Highly noise affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Receiver type	Time of day	Noise management level $L_{Aeq(15minute)}$[1,2]	How to apply
	Outside recommended standard hours	Noise affected RBL + 5 dB	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.
Office, retail outlets	When is use	Highly noise affected 70 dBA	The external noise levels should be assessed at the most-affected occupied point of the premises

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 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Note 2 The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Industrial Noise Policy (EPA 2000).

The ICNG also provides NMLs for non-residential land uses. Unlike residential receivers, these criteria are fixed levels, independent of local background noise levels. Presented below in Table 4 are NMLs for non-residential land uses.

Table 4 Construction noise management levels – other receivers

Land use	Location applied	Noise management level, $L_{Aeq,15min}$
Classrooms and other educations institutions	Internal noise level	45 dB(A)
Hospital wards and operating theatres	Internal noise level	45 dB(A)
Places of worship	Internal noise level	45 dB(A)
Active recreation areas (characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion)	External noise level	65 dB(A)
Passive recreation areas (characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example, reading, meditation)	External noise level	60 dB(A)
Community centres	Refer to the recommended "maximum" internal levels in AS2107 for specific uses	
Industrial premises	External noise level	75 dB(A)
Offices, retail outlets	External noise level	70 dB(A)

3.2 Site specific construction noise management levels

The measured RBLs are bellow the Noise Policy for Industry's (NPfI) minimum RBLs (Table 2 of the NPfI). In accordance with the requirements of the NPfI, the ICNG noise management levels have been based on the NPfI RBLs, rather than the lower measured levels.

Presented below in Table 5 is the noise management levels for each noise logger.

Table 5 Site specific external construction noise management levels, dB(A)

Area	Type	Daytime 7am to 6pm	Evening 6pm to 10pm	Night-time 10pm to 7am	Highly noise affected
L1	Residential	45	35	35	75
L2	Residential	45	35	35	75

3.3 Construction vibration criteria

Effects of ground borne vibration on buildings may be segregated into two major categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself

Vibration criteria – human comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled *"Assessing Vibration – A Technical Guideline"*. (AVTG) This type of impact can be defined based on the nature of the construction works:

- Continuous vibration – from uninterrupted sources (refer to Table 6).
- Impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (refer to Table 7).
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (refer to Table 8).

Table 6 Continuous vibration acceleration criteria (m/s^2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
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
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 7 Impulsive vibration acceleration criteria (m/s^2) 1 Hz-80 Hz

Location	Assessment period	Preferred values		Maximum values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
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
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 8 Intermittent vibration impacts criteria (m/s$^{1.75}$) 1 Hz-80 Hz

Location	Daytime		Night-time	
	Preferred	Maximum	Preferred	Maximum
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
Workshops	0.80	1.60	0.80	1.60

Vibration criteria – building contents and structure

The vibration effects on the building is provided by British Standard BS 7385: Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration" (BSI 1993)

The criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised in Table 7 and illustrated in Figure 2.

Table 9 Transient vibration criteria as per standard BS 7385 Part 2 - 1993

Line in standard	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Standard BS 7385 Part 2 – 1993 states that the values in Table 9 relate to transient vibration which does not cause resonant responses in buildings.

Where the dynamic loading caused by continuous vibration events is such as that results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 9 may need to be reduced by up to 50% (refer to Line 3 in Figure 2).

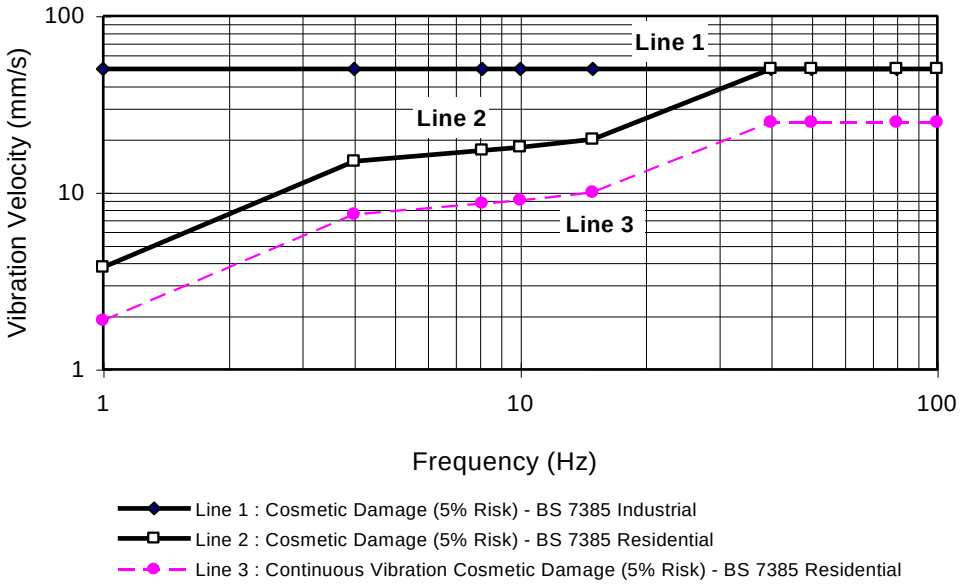


Figure 3 BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage

In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 9, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 9 should not be reduced for fatigue considerations.

Project vibration criteria

Based on the details included in the sections above the project specific vibration criteria to protect the surrounding residential receivers from structural or architectural damage includes the following:

- Project construction vibration management level at all surrounding building structures – 7.5 mm/s.

In the event that this vibration criteria is exceeded, further investigation is required, including an assessment of the nature of the vibration and frequency characteristics to determine if the vibration criteria can be relaxed for the specific nature of the works.

4 CONSTRUCTION NOISE AND VIBRATION IMPACTS

Noise impacts from construction works associated with the project have been predicted in accordance with the requirements in the EPAs NPfI. Presented below is a summary of the construction activities, equipment and associated sound power levels, and a summary of the predicted noise impacts from the works. An assessment has been completed of the typical worst-case noise impacts. Noise from the project is likely to be often lower than the noise levels presented in this assessment.

4.1 Construction noise scenarios

Sound power levels have been predicted for the construction tasks identified in the project program. The equipment anticipated for use in each task is based on previous project experience. The sound power levels for the equipment likely to be used for each of the listed tasks are provided in Table 10 below.

Table 10 Summary of predicted sound power levels, dB(A)

Tasks	Equipment	Sound power levels (dBA re 1pW)	Aggregate per task (dBA re 1pW)
Early works			
Site establishment works	Mobile crane	110	113
	Power hand tools	109	
	Semi Rigid Vehicle [1]	105	
Ground works and demolition	Excavator	112	120
	Hydraulic Hammer	118	
	Piling Rig	110	
	Handheld jack hammer [1]	111	
	Dump truck [1]	104	
	Concrete saw [1]	114	
	Skid steer	110	
	Power hand tools	109	
Road works	Dump truck	110	112
	Asphalt truck and sprayer	103	
	Smooth drum roller	107	
	Concrete truck	109	
	Concrete saw	118	
Main works			
Structure	Handheld jack hammer [1]	106	117
	Concrete saw [1]	114	
	Power hand tools	109	
	Welder	101	
	Concrete pump truck	110	
	Concrete agitator truck	108	

Tasks	Equipment	Sound power levels (dBA re 1pW)	Aggregate per task (dBA re 1pW)
Common and External Works	Concrete agitator truck	108	114
	Saw cutter [1]	104	
	Dump truck [1]	104	
	Concrete saw [1]	114	
	Power hand tools	109	

4.2 Assessment methodology

Calculation of the noise impacts have been undertaken in accordance with the ISO9613 noise propagation algorithm at the most affected sensitive receiver locations. Receivers located further from the site would have lower noise levels from the proposed works.

The construction works would be undertaken in accordance with the approved SSDA development consent conditions. The construction hours are restricted to:

- Monday to Friday 7 am to 6 pm
- Saturday 8am to 1pm
- Sunday/Public Holiday No work or ancillary activity

Outside these hours, the following work may be undertaken:

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

4.3 Predicted construction noise impacts

An assessment of the expected construction noise impacts has been assessed using the ISO9613 noise propagation algorithm. The assessment has been based on the expected noise levels to be generated on the site including those detailed in the Section above. Calculations of the resulting construction noise levels of the receivers within proximity to the site is detailed in the table below for the potentially most affected sensitive receivers. Noise contours are presented in Appendix B to show the impact for all receivers surrounding the site.

Table 11 Predicted construction noise impacts, $L_{Aeq,15min}$ dB(A)

Receiver	Criteria	Predicted level	Exceedance	Highly noise affected
Site establishment				
R1 – Residential	45	35	-	No
R2 - Residential	45	39	-	No
R3 – Residential	45	38	-	No
Ground works and demolition				
R1 – Residential	45	42	-	No
R2 - Residential	45	46	1	No
R3 – Residential	45	45	-	No
Road works				
R1 – Residential	45	34	-	No
R2 - Residential	45	37	-	No
R3 – Residential	45	36	-	No
Structures				
R1 – Residential	45	40	-	No
R2 - Residential	45	43	-	No
R3 – Residential	45	40	-	No
Common and external works				
R1 – Residential	45	37	-	No
R2 - Residential	45	48	3	No
R3 – Residential	45	37	-	No

The predicted construction noise impacts provided in Table 11 identify that exceedance of the noise management levels are unlikely to occur on a regular basis, however have the potential to occur during the most noise intensive periods at the nearest sensitive receiver. Impacts of this magnitude are common for this type of project and highlight the need for appropriate noise management and mitigation measures. Provided in Section 5 is a summary of recommended management and mitigation measures which should be followed.

4.4 Construction vibration assessment

To maintain compliance with the human comfort vibration criteria identified in Section 3.2, it is recommended that the indicative safe distances listed in Table 12 should be maintained. These indicative safe distances should be validated prior to the start of construction works by undertaking measurements of vibration levels generated by construction equipment to be used on site.

If applicable, the criteria for scientific or medical equipment (should any of these exist close to the site) can be more stringent than those required for human comfort. Vibration validating measurements should be conducted at each site to determine the vibration level and potential impact onto this sensitive equipment.

Recommended safe working distances for various items of plant are included in the following table.

Table 12 Recommended indicative safe working distances for vibration intensive plant

Plant	Rating / Description	Safe Working Distances (m)	
		Cosmetic Damage	Human Comfort (AVTG)
Vibratory roller	< 50 kN (Typically 1 – 2 tonnes)	5	15 – 20
	< 100 kN (Typically 2 – 4 tonnes)	6	20
Small hydraulic hammer	300 kg, typically 5 – 12 tonnes excavator	2	7
Medium hydraulic hammer	900 kg, typically 12 – 18 tonnes excavator	7	23
Large hydraulic hammer	1600 kg, typically 18 – 34 tonnes excavator	22	73
Vibratory pile driver	Sheet piles	2 – 20	20
Jackhammer	Hand held	1	Avoid contact with structure and steel reinforcements

An assessment of the potential for vibration generated as part of the required construction activities on the project (including excavation) has been undertaken based on the expected vibration detailed in the table above.

Given the significant offset distance to nearby sensitive receivers, an exceedance of the safe working distances is very unlikely. However, exceedances are possible within the existing facility. Given the nature of the structure it is unlikely that any vibration mitigation or management measures would be required. Occupants of the building may be able to feel the vibration at times, so communication before the works would assist in reducing any adverse impacts.

5 NOISE AND VIBRATION MANAGEMENT MEASURES

Provided below in Table 13 is a summary of the recommended management procedures for airborne noise and vibration impacts. These procedures are also further discussed in the report. Hence, where applicable, links to further references are provided in Table 13.

Table 13 Summary of mitigation procedures

Procedure	Abbreviation	Description	Further Reference
General Management Measures	GMM	Introduce best-practice general mitigation measures in the workplace which are aimed at reducing the acoustic impact onto the nearest affected receivers.	Refer to Section 5.3.3 For vibration impact, also refer to section 4.4
Project Notification	PN	Issue project updates to stakeholders, discussing overviews of current and upcoming works. Advanced warning of potential disruptions can be included. Content and length to be determined on a project-by-project basis.	Refer to Section 6
Verification Monitoring	V	Monitoring to comprise attended or unattended acoustic surveys. The purpose of the monitoring is to confirm measured levels are consistent with the predictions in the acoustic assessment, and to verify that the mitigation procedures are appropriate for the affected receivers. If the measured levels are higher than those predicted, then the measures will need to be reviewed and the management plan will need to be amended.	For noise impact, refer to Section 5.4. For vibration impact, refer to Section 4.4
Complaints Management System	CMS	Implement a management system which includes procedures for receiving and addressing complaints from affected stakeholders	Refer to Section 0
Specific Notification	SN	Individual letters or phone calls to notify stakeholders that noise levels are likely to exceed noise objectives. Alternatively, contractor could visit stakeholders individually in order to brief them in regards to the noise impact and the mitigation measures that will be implemented.	Refer to Section 6
Respite Offer	RO	Offer provided to stakeholders subjected to an ongoing impact. The offer could include movie tickets, meal vouchers, gift cards or equivalent measures.	-

Procedure	Abbreviation	Description	Further Reference
Alternative Construction Methodology	AC	Contractor to consider alternative construction options that achieve compliance with relevant criteria. Alternative option to be determined on a case-by-case basis. It is recommended that the selection of the alternative option should also be determined by considering the assessment of on-site measurements (refer to Verification Monitoring above).	-

The application of these procedures is in relation to the exceedances over the relevant criteria. For airborne noise, the criteria are based on NMLs. The allocation of these procedures is discussed in Section 5.1

For vibration, the criteria either correspond to human comfort, building damage or scientific and medical equipment. The application of these procedures is discussed in Section 5.2.

5.1 Allocation of noise management procedures

For residences, the management procedures have been allocated based on noise level exceedances at the affected properties, which occur over the designated NMLs (refer to Section 0). The allocation of these procedures is summarised in Table 14 below.

Table 14 Allocation of noise management procedures

Construction Hours	Exceedance over NML (dB)	Management procedures (see definition above)
Standard Hours Mon – Fri: 7:00 am to 6:00 pm Sat: 8:00 am – 1:00 pm	0 - 3	GMM
	4 - 10	GMM, PN, V [1], CMS, AC
	> 10	GMM, PN, V, CMS, SN, AC

1. Verification monitoring to be undertaken upon complaints received from affected receivers

Please note the following regarding the allocation of these procedures:

- The exceedances have been estimated as part of the acoustic assessment, and these are summarised in Section 4.3.
- The allocation of procedures is based on the assumptions used for noise level predictions (refer to Section 4). Consequently, these allocations can be further refined once additional details of the construction program become available.

5.2 Allocation of vibration management procedures

Table 15 below summarises the vibration management procedures to be adopted based on exceedance scenarios (i.e., whether the exceedance occurs over human comfort criteria, building damage criteria, or criteria for scientific and medical equipment). Please note these management procedures apply for any type of affected receiver.

Table 15 Allocation of vibration management procedures

Construction Hours	Exceedance Scenario	Management procedures
Standard Hours Mon – Fri: 7:00 am to 6:00 pm Sat: 8:00 am – 1:00 pm	Over human comfort criteria (refer to Section 3.3)	GMM, PN, V, RO
	Over building damage criteria (refer to Section 3.3)	GMM, V, AC

5.3 General comments

The contractor will, where reasonable and feasible, apply best practice noise mitigation measures. These measures shall include the following:

- Maximising the offset distance between plant items and nearby noise sensitive receivers.
- Preventing noisy plant working simultaneously and adjacent to sensitive receivers.
- Minimising consecutive works in the same site area.
- Orienting equipment away from noise sensitive areas.
- Carrying out loading and unloading away from noise sensitive areas.

In order to minimise noise impacts during the works, the contractor will take all reasonable and feasible measures to mitigate noise effects.

The contractor will also take reasonable steps to control noise from all plant and equipment. Examples of appropriate noise control include efficient silencers and low noise mufflers.

The contractor should apply all feasible and reasonable work practices to meet the NMLs and inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels, duration of noise generating construction works, and the contact details for the proposal.

5.3.1 Alternate equipment or process

Exceedance of the site's NMLs should result in an investigation as to whether alternate equipment could be used, or a difference process could be undertaken.

In some cases, the investigation may conclude that no possible other equipment can be used, however, a different process could be undertaken.

5.3.2 Acoustic enclosures/screening

Typically, on a construction site there are three different types of plant that will be used: mobile plant (i.e., excavators, skid steers, etc.), semi mobile plant (i.e., hand tools generally) or static plant i.e. (diesel generators).

For plant items which are static it is recommended that, in the event exceedances are being measured due to operation of the plant item, an acoustic enclosure/screen is constructed to reduce impacts. These systems can be constructed from Fibre Cement (FC) sheeting or, if airflow is required, acoustic attenuators or louvres.

For semi mobile plant, relocation of plant should be investigated to either be operated in an enclosed space or at locations away from a receiver.

With mobile plant it is generally not possible to treat these sources. However, investigations into the machine itself may result in a reduction of noise (i.e., mufflers/attenuators etc).

5.3.3 General mitigation measures (Australia Standard 2436-2010)

As well as the above project specific noise mitigation controls, AS 2436-2010 *"Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites"* sets out numerous practical recommendations to assist in mitigating construction noise emissions. Examples of strategies that could be implemented on the subject project are listed below, including the typical noise reduction achieved, where applicable.

5.3.4 Adoption of universal work practices

- Regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration.

- Regular identification of noisy activities and adoption of improvement techniques.
- Avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby sensitive receivers.
- Where possible, avoiding the use of equipment that generates impulsive noise.
- Minimising the need for vehicle reversing for example (particularly at night), by arranging for one-way site traffic routes.
- Use of broadband audible alarms on vehicles and elevating work platforms used on site.
- Minimising the movement of materials and plant and unnecessary metal-on-metal contact.
- Minimising truck movements.

5.3.5 Plant and equipment

The operation of plant and equipment on the site should be undertaken, including the following:

- Choosing quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks.
- Selecting plant and equipment with low vibration generation characteristics.
- Operating plant and equipment in the quietest and most efficient manner.

5.3.6 Work scheduling

- Providing respite periods which could include restricting very noisy activities to time periods that least affect the nearby noise sensitive locations, restricting the number of nights that after-hours work is conducted near residences or by determining any specific requirements.
- Scheduling work to coincide with non-sensitive periods.
- Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from the sensitive receivers.
- Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours.
- Including contract conditions that include penalties for non-compliance with reasonable instructions by the principal to minimise noise or arrange suitable scheduling.

5.3.7 Source noise control strategies

Some ways of controlling noise at the source are:

- Where reasonably practical, noisy plant or processes should be replaced by less noisy alternatives.
- Modify existing equipment: Engines and exhausts are typically the dominant noise sources on mobile plant such as cranes, graders, excavators, trucks, etc. In order to minimise noise emissions, residential grade mufflers should be fitted on all mobile plant utilised on site.
- Siting of equipment: locating noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area; or orienting the equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise.
- Regular and effective maintenance.

5.3.8 Miscellaneous comments

Deliveries should be undertaken, where possible, during standard construction hours.

Maximise hammer penetration (and reduce blows) by using sharp hammer tips. Keep stocks of sharp profiles at site and monitor the profiles in use.

It is advised that mobile plant and trucks operating on site for a significant portion of the project are to have reversing alarm noise emissions minimised. This is to be implemented subject to recognising the need to maintain occupational safety standards.

No public address system should be used on site.

5.4 Vibration mitigation measures

The following vibration mitigation measures should be implemented:

- Any vibration generating plant and equipment is to be in areas within the site to lower the vibration impacts.
- Investigate the feasibility of rescheduling the hours of operation of major vibration generating plant and equipment.
- Use lower vibration generating items of construction plant and equipment; that is, smaller capacity plant.
- Minimise conducting vibration generating works consecutively in the same area (if applicable).
- Undertake the removal of concrete within the building using saw cutting or pulverising where possible.

5.5 Construction vibration mitigation

An assessment of the potential for vibration generated as part of the required construction activities as part of the project (including ground works and construction) has been undertaken. The assessment of potential vibration impact has been undertaken such that safe working distances can be assessed such that vibration impacts can be managed for compliance with the criteria detailed in the table below.

Table 16 Recommended indicative safe working distances

Plant	Rating / Description	Safe Working Distances (m)
		Cosmetic Damage (BS 7385: Part 2 DIN 4150: Part 3)
Vibratory roller	< 50 kN (Typically 1 – 2 tonnes)	5 m
	< 100 kN (Typically 2 – 4 tonnes)	6 m
	> 200 kN (Typically 4 – 6 tonnes)	12 m
Small hydraulic hammer	300 kg, typically 5 – 12 tonnes excavator	2 m
Medium hydraulic hammer	900 kg, typically 12 – 18 tonnes excavator	7 m
Large hydraulic hammer	1600 kg, typically 18 – 34 tonnes excavator	22 m
Vibratory pile driver	Sheet piles	20 m
Jackhammer	Hand held	3 m
Auger or Rotary Piling	Piling including non-percussive piling equipment	2m
Demolition Activities	Including demolition of the exiting building with excavator with hydraulic hammers and the like	5 m
Ground works of soft fill and material	Including excavators with buckets and the like	No limit

Movement of tracks and excavators	Movement of construction equipment without mitigation	5 m
Saw cutting of rock	Saw cutting using cutters installed to excavators or hand held equipment	No limit

Recommended construction methodologies which should be included as part of the proposed construction of the site include the following:

1. The processing (such as pummelling of material and the like) of materials should be undertaken at a location with a maximum distance from the channel, including distance of not less than 10m.
2. In the event rock breaking is required within proximity to the channel included in the table above a saw cut at the perimeter of the area to be removed is required to be undertaken prior to other activities commencing.

5.6 Noise and vibration monitoring

Noise monitoring, if required, will be performed by an acoustical consultant directly engaged by the contractor in accordance with the projects Conditions of Consent.

Noise monitoring is recommended to be undertaken by attended noise measurements at the start of any new phase of works (i.e. demolition, ground works or remediation works etc.). The statistical parameters to be measured should include the following noise descriptors: L_{Amin}, L_{A90}, L_{A10}, L_{A1}, L_{Amax} and L_{Aeq}. Unattended noise measurements should be conducted over consecutive 15 minute periods.

The survey methodology and any equipment should comply with the requirements discussed in Standard AS 1055.1-1997.

As part of the management of noise and vibration from the proposed demolition and ground works activities to be undertaken on the site the following noise and vibration measurements are recommended to be undertaken:

1. Noise Monitoring –
    a. Attended noise level measurements of typical demolition and ground works activities should be undertaken at site. Attended construction noise surveys of the site and surrounding impacts on neighbours should be undertaken during the following as a minimum:
        i. Start of Demolition
        ii. Commencement of any rock breaking or sawing on the site.
        iii. In response to any ongoing complaints received from neighbours.

2. Vibration Monitoring– To confirm vibration magnitudes are within the expected levels the following attended vibration measurements are required:
    a. Short term attended vibration measurements – Attended short term vibration measurement of activities with the potential to generate maximum vibration to be undertaken on commencement at the site, including the following:
        i. Measurements to be undertaken at a representative location from the activity being conducted with a similar distance to the potentially affected receiver.
        ii. Activities with the potential to generate the greatest magnitudes of vibration include:
        iii. Hydraulic hammering of concrete slabs.
        iv. Hydraulic hammering during ground works within rock.

6 COMMUNITY ENGAGEMENT AND CONSULTATION

Active community consultation and the maintenance of positive relations with local residents and businesses would assist in alleviating concerns and thereby minimising complaint. It is common for construction projects to provide community consultation if an exceedance of noise goals has been predicted. This communication is commonly conducted in the form of a letter box drop or more active engagement with more highly impacted receivers.

This form of notification should provide specific notification of the duration and timing of the construction activities so that residents are informed about the proposed works ahead of time. The letter should also provide the community with a hotline number for a community liaison officer available to adequately respond to all project related enquiries.

Ideally the hotline number should provide concerned locals an opportunity to raise any concerns with the project proponent and provide an opportunity to determine the best method to satisfy all requirements.

Prior to the works onsite being undertaken, it is recommended that community consultation with the neighbouring affected parties be undertaken as detailed in the projects Community Consultation and Engagement Plan which will be undertaken by the building contractor.

However, should not be limited to the beginning of the onsite works but throughout, providing the community with constant updates on the progress and upcoming works. In our experience these could include:

- Site noticeboard,
- Email notifications; and
- Letterbox drops.

During the proposed construction of the project (including demolition, ground works and construction) the building contractor is required to engage in community interaction. The community interaction and notification is required to include the following:

1. Notification of the proposed works to be undertaken on the site and the periods when works will be conducted, including information regarding the programme of works such as demolition and ground works. This should include the expected period when activities such as hydraulic hammering, rock breaking, concrete or rock sawing is required to be undertaken.
2. Details of the relevant site representative where complaints can be registered.
3. Details of the methodology to respond to complaints raised from the surrounding receivers.
4. A register of complaints, to be kept on site including record of time and nature of the complaint as well as the outcomes and comments regarding investigations resulting from the complaint.

6.1 Complaints management system

Should complaints arise they must be dealt with in a responsible and uniform manner, therefore, a management system to deal with complaints is detailed below:

Local residents and land owners should be informed by direct mail of a direct 24-hour telephone line where any noise complaints related to the construction will be recorded. The 24-hour telephone line number will be made available on the construction site signage.

All complaints should be investigated by the Contractor in accordance with the procedures outlined in Australia Standard 2436-2010. Consequently, a complaint response procedure should be implemented. Information to be gathered as part of this process should include:

- location of complainant
- time/s of occurrence of alleged noise or vibration impacts
- nature of impact particularly with respect to vibration
- Perceived source
- Prevailing weather conditions and similar details that could be utilised to assist in the investigation of the complaint.

All resident complaints will be responded to in the required timeframe and action taken recorded.

Post receiving a noise and or vibration complaint, the process outlined in the *Contingency Plans* below should be undertaken.

6.2 Contingency plans

Contingency plans are required to address noise or vibration problems if excessive levels are measured at surrounding sensitive receivers and/or if justified complaints occur. Such plans include:

- Stop the onsite works.
- Identify the source of the main equipment within specific areas of the site which is producing the most construction noise and vibration at the sensitive receivers; and
- Review the identified equipment and determine if an alternate piece of equipment can be used or the process can be altered.
- In the event an alternate piece of equipment or process can be used, works can re-commence.
- In the event an alternate piece of equipment or process cannot be determined implement a construction assessment to be performed by a suitably qualified acoustic consultant.

The Superintendent shall have access to view the Contractor's noise measurement records on request. The Superintendent may undertake noise monitoring if and when required.

7 CONCLUSION

Pulse White Noise Acoustics has been engaged by BESIX Watpac to prepare a Construction Noise and Vibration Management Plan (CNVMP) for the construction of the Oakburn Poultry Processing Facility. This CNVMP has been prepared to satisfy the requirements of the project SSD (SSD-9394) development consent conditions.

The site is located on the Oxley Highway at Westdale, north-west of Tamworth. The site is predominantly surrounded by industrial uses and the Tamworth airport, with residential receivers sparsely located to the north-west, north, and east. While there are noise generating industries in the area, the background noise levels are representative of a rural environment.

Noise and vibration criteria have been based on the conditions of consent, the EPAs ICNG, and the EPAs AVATG. The ICNG and NMLs are based on the background noise measurements and the requirements of the ICNG.

Noise and vibration impacts have been assessed for five construction scenarios and associated construction equipment. The assessment has found that at times works would exceed the applicable noise management levels. During times where the most noise intensive equipment is not operating, the noise levels are likely to slightly exceed or potentially comply with the NMLs.

These impacts are typical of construction works of this nature and highlight the importance of effective management and mitigation measures. Provided in Section 5 of this document are recommended measures to reduce the impacts from the works.

Vibration impacts have been assessed against the EPAs AVATG, and have identified that the proposed equipment would comply with the safe working distances and meet the requirements of the vibration criteria defined in the condition of consent. Vibration management and mitigation measures have been recommended in Section 5 to ensure that impacts are reduced as much as practicable.

Provided in Section 6 are community engagement and consultation recommendations are to assist in alleviating concerns from local residents and businesses. The incorporation of these recommendations in the approach to the works should reduce adverse reactions from the local community.

For any additional information please do not hesitate to contact the person below.

Regards

Michael Allan
Technical Director

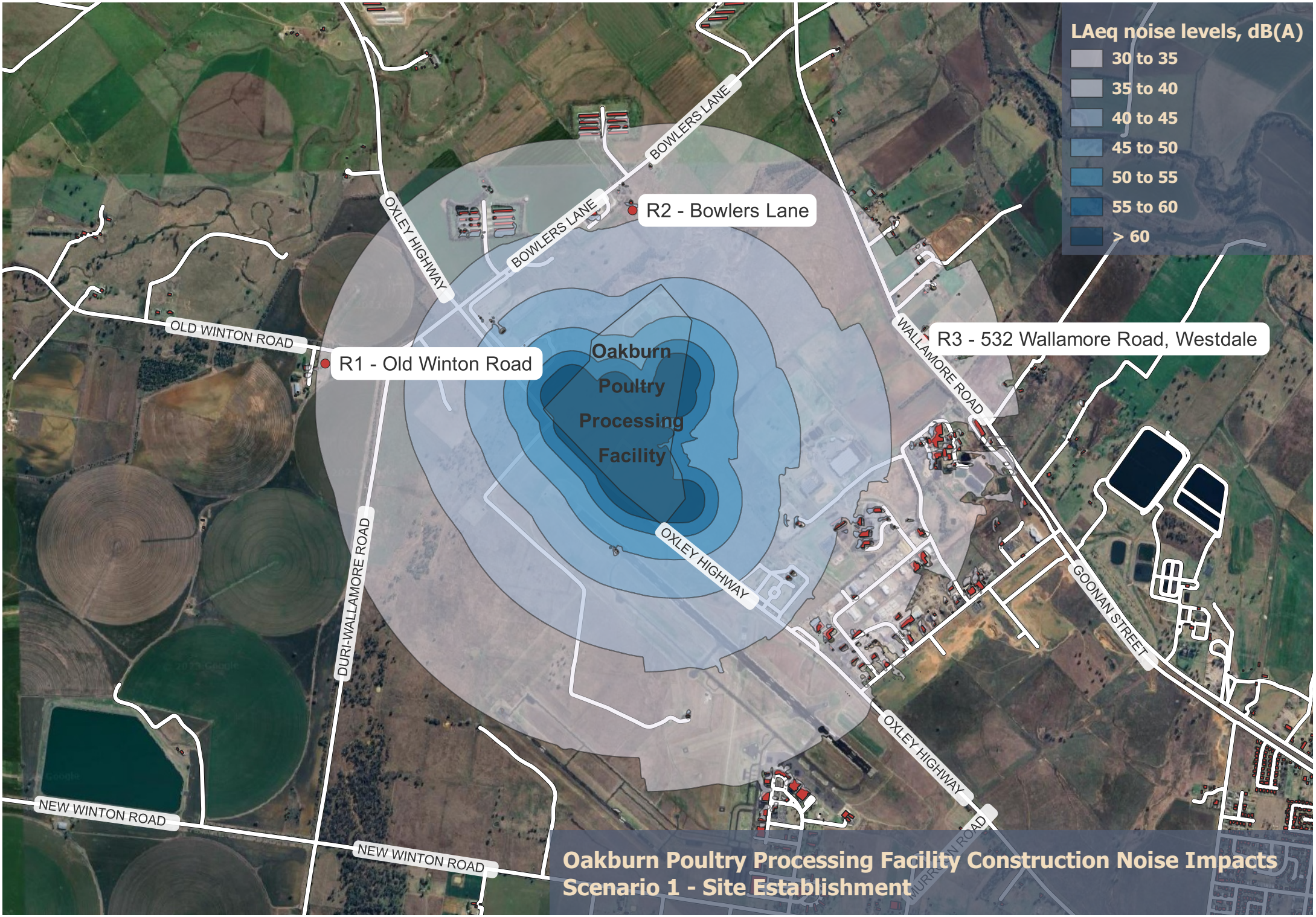
Pulse White Noise Acoustics

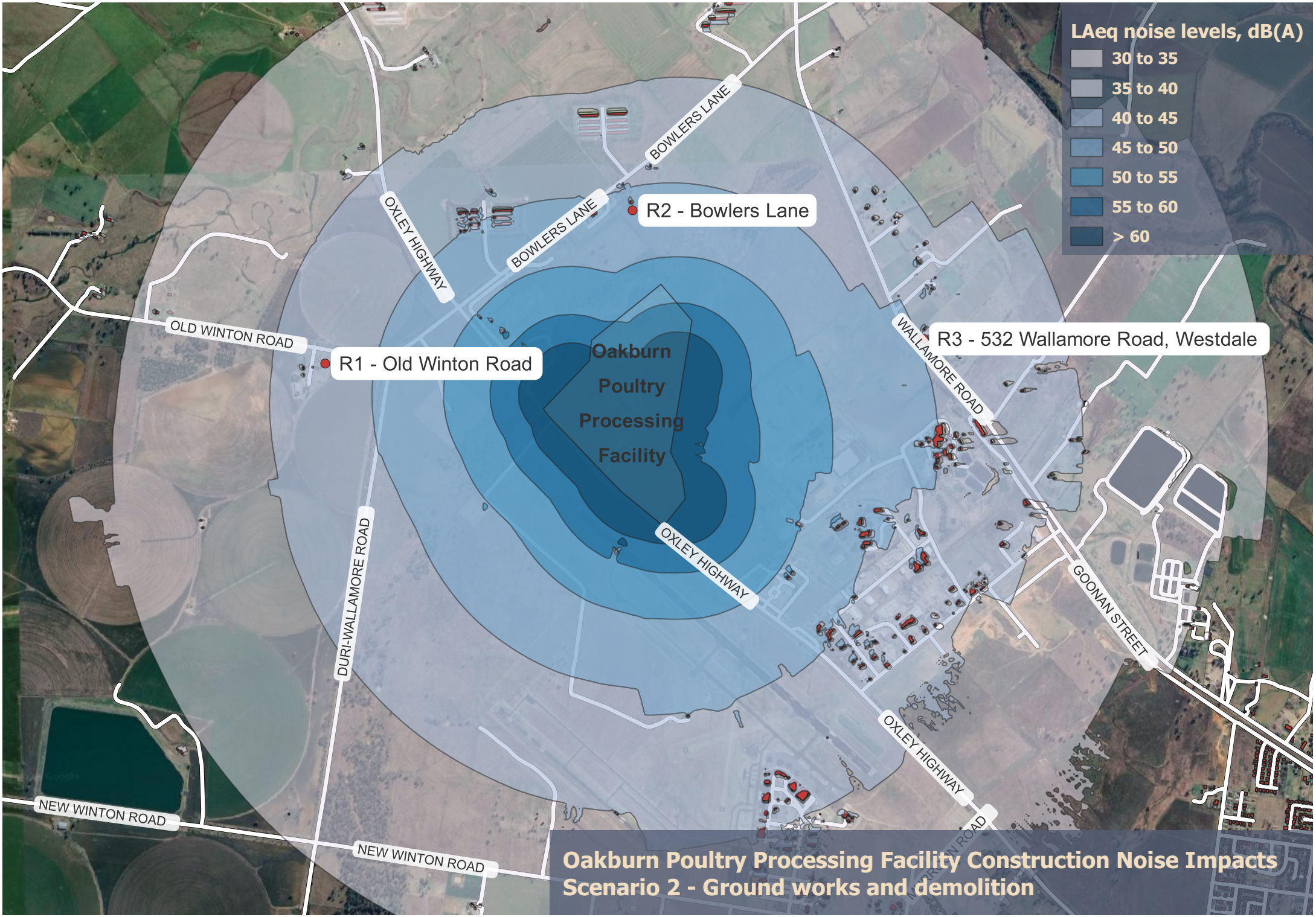
APPENDIX A. ACOUSTIC TERMINOLOGY

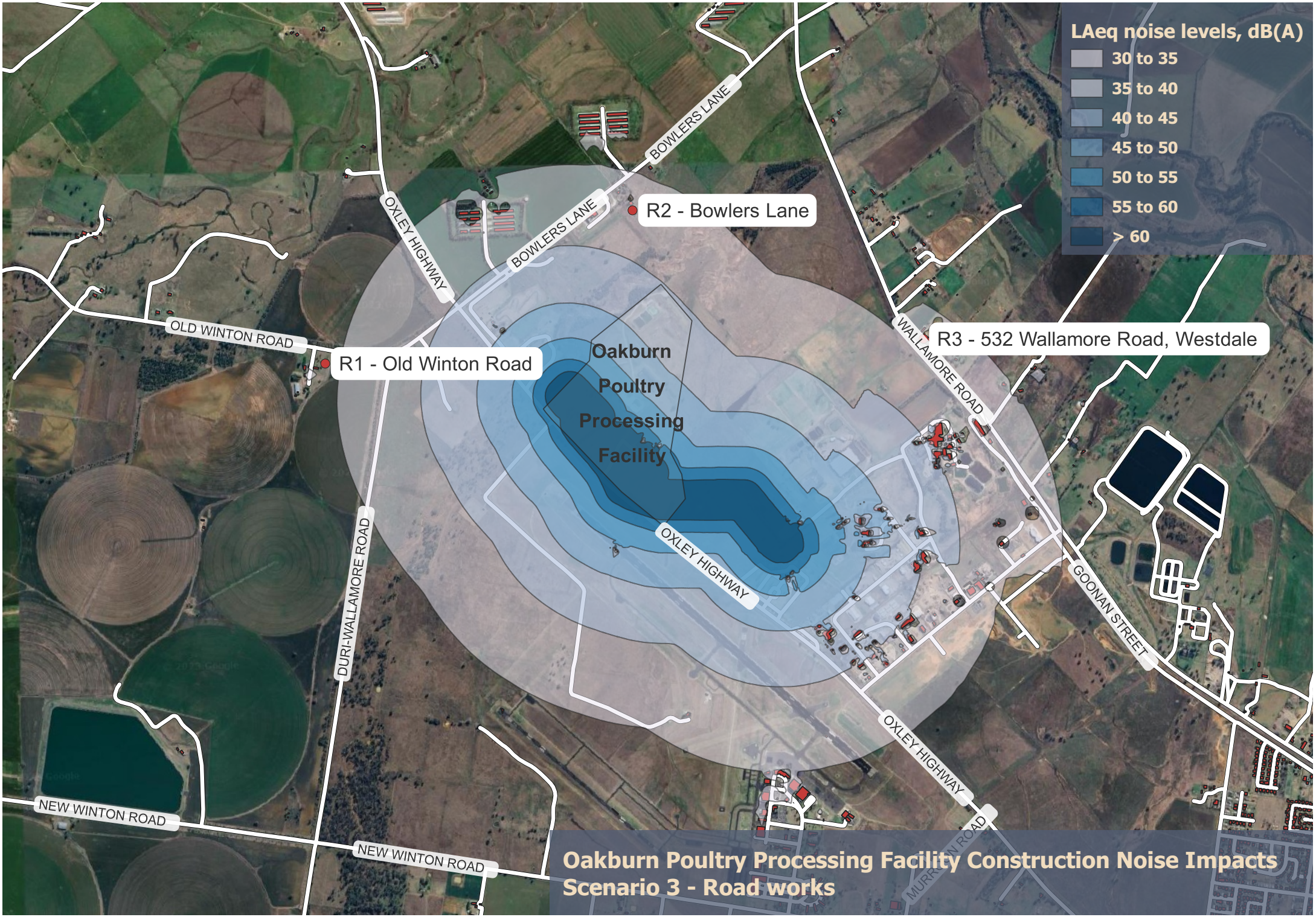
The following is a brief description of the acoustic terminology used in this report:

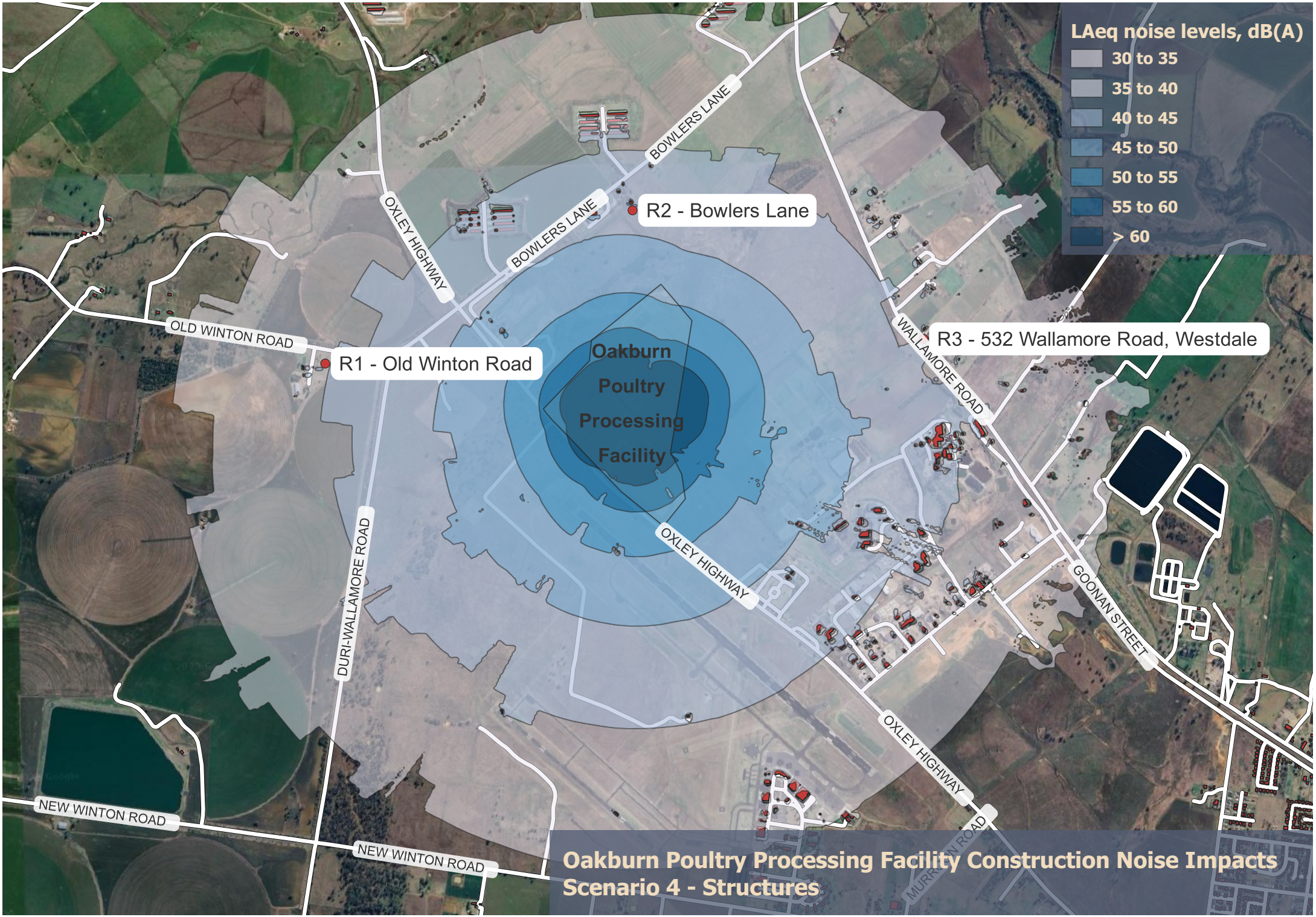
Ambient Sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Audible Range	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
Character, acoustic	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; 0dB the faintest sound we can hear 30dB a quiet library or in a quiet location in the country 45dB typical office space. Ambience in the city at night 60dB Martin Place at lunch time 70dB the sound of a car passing on the street 80dB loud music played at home 90dB the sound of a truck passing on the street 100dB the sound of a rock band 115dB limit of sound permitted in industry 120dB deafening
dBA	*A-weighted decibels* The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dBA. Practically all noise is measured using the A filter. The sound pressure level in dBA gives a close indication of the subjective loudness of the noise.
Frequency	Frequency is synonymous to *pitch*. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
L_{max}	The maximum sound pressure level measured over a given period.
L_{min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dBA.
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Sound Pressure Level, LP dB	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
Sound Power Level, Lw dB	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt.

APPENDIX B. NOISE CONTOURS


LAeq noise levels, dB(A)
30 to 35
35 to 40
40 to 45
45 to 50
50 to 55
55 to 60
> 60
R1 - Old Winton Road
R2 - Bowlers Lane
R3 - 532 Wallamore Road, Westdale
Oakburn Poultry Processing Facility
OLD WINTON ROAD
BOWLERS LANE
BOWLERS LANE
OXLEY HIGHWAY
WALLAMORE ROAD
OXLEY HIGHWAY
DURI-WALLAMORE ROAD
GOONAN STREET
OXLEY HIGHWAY
NEW WINTON ROAD
NEW WINTON ROAD
Oakburn Poultry Processing Facility Construction Noise Impacts
Scenario 1 - Site Establishment


LAeq noise levels, dB(A)
30 to 35
35 to 40
40 to 45
45 to 50
50 to 55
55 to 60
> 60
R1 - Old Winton Road
R2 - Bowlers Lane
R3 - 532 Wallamore Road, Westdale
Oakburn Poultry Processing Facility
OLD WINTON ROAD
BOWLERS LANE
BOWLERS LANE
OXLEY HIGHWAY
WALLAMORE ROAD
DURI-WALLAMORE ROAD
OXLEY HIGHWAY
GOONAN STREET
OXLEY HIGHWAY
NEW WINTON ROAD
NEW WINTON ROAD
Oakburn Poultry Processing Facility Construction Noise Impacts
Scenario 2 - Ground works and demolition


LAeq noise levels, dB(A)
30 to 35
35 to 40
40 to 45
45 to 50
50 to 55
55 to 60
> 60
R1 - Old Winton Road
R2 - Bowlers Lane
R3 - 532 Wallamore Road, Westdale
Oakburn Poultry Processing Facility
OLD WINTON ROAD
BOWLERS LANE
BOWLERS LANE
OXLEY HIGHWAY
WALLAMORE ROAD
DURI-WALLAMORE ROAD
OXLEY HIGHWAY
GOONAN STREET
OXLEY HIGHWAY
NEW WINTON ROAD
NEW WINTON ROAD
MURRAY ROAD
Oakburn Poultry Processing Facility Construction Noise Impacts
Scenario 3 - Road works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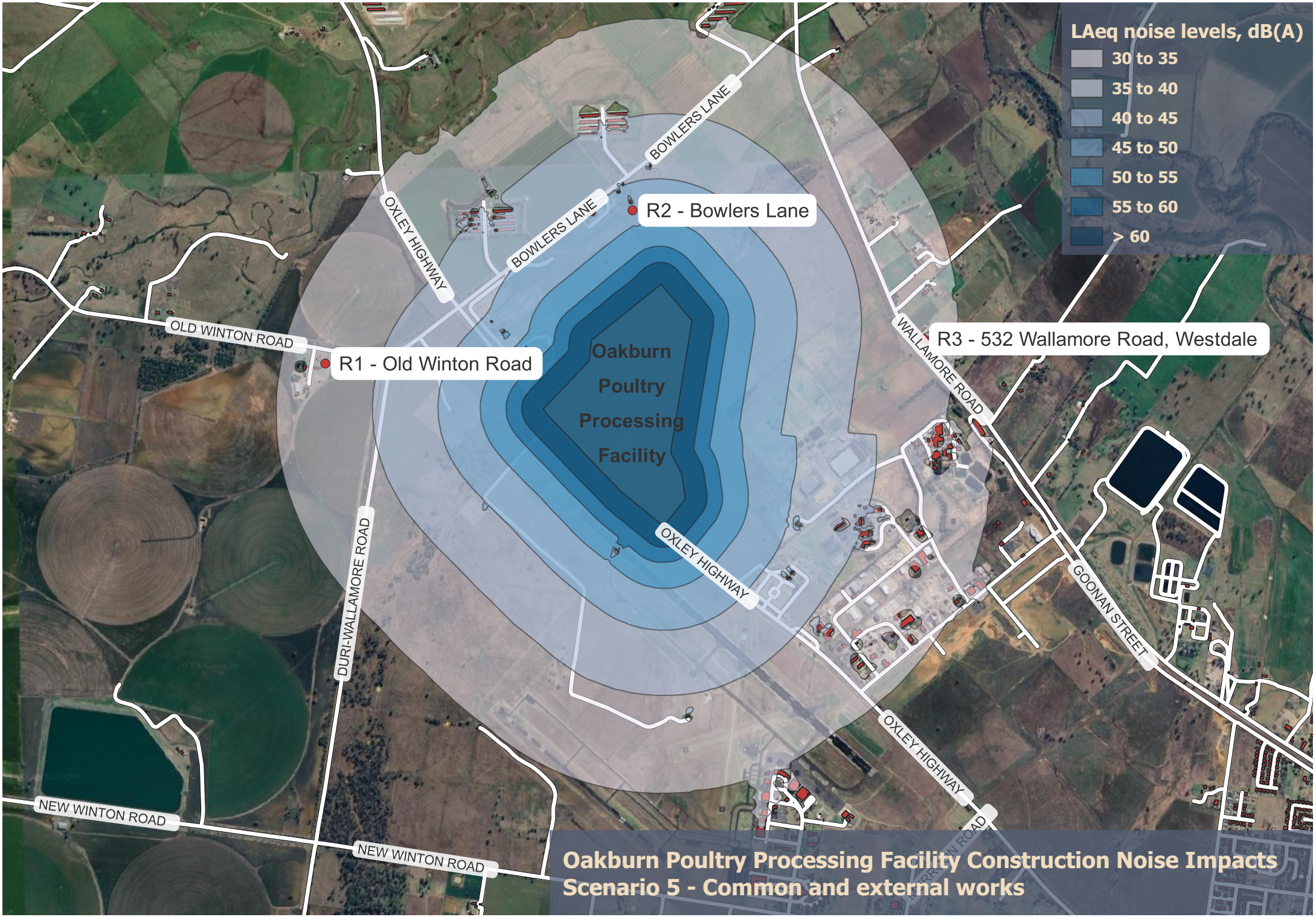
40 to 45
45 to 50
50 to 55
55 to 60
> 60
R1 - Old Winton Road
R2 - Bowlers Lane
R3 - 532 Wallamore Road, Westdale
Oakburn Poultry Processing Facility
OLD WINTON ROAD
BOWLERS LANE
BOWLERS LANE
OXLEY HIGHWAY
WALLAMORE ROAD
DURI-WALLAMORE ROAD
OXLEY HIGHWAY
GOONAN STREET
OXLEY HIGHWAY
NEW WINTON ROAD
NEW WINTON ROAD
Oakburn Poultry Processing Facility Construction Noise Impacts
Scenario 4 - Structures


LAeq noise levels, dB(A)
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35 to 40
40 to 45
45 to 50
50 to 55
55 to 60
> 60
R1 - Old Winton Road
R2 - Bowlers Lane
R3 - 532 Wallamore Road, Westdale
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DURI-WALLAMORE ROAD
OXLEY HIGHWAY
GOONAN STREET
OXLEY HIGHWAY
NEW WINTON ROAD
NEW WINTON ROAD
Oakburn Poultry Processing Facility Construction Noise Impacts
Scenario 5 - Common and external works

13 APPENDIX D – CONSTRUCTION TRAFFIC MANAGEMENT PLAN

Oakburn Poultry Processing Facility Westdale Construction Traffic Management Plan

Prepared for:

Richard Crookes Constructions Pty Ltd

26 June 2023

The Transport Planning Partnership

Oakburn Poultry Processing Facility Westdale

Construction Traffic Management Plan

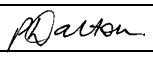
Client: Richard Crookes Constructions Pty Ltd

Version: V02

Date: 26 June 2023

TTPP Reference: 23199

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	21/06/23	Paul Cai	Jessica Ng	Penny Dalton	Penny Dalton
V02	26/06/23	Paul Cai	Jessica Ng	Penny Dalton	

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1 Introduction

1.1 Project Background

On 18 December 2020, development consent was issued by the NSW Department of Planning, Industry and Environment for construction and operation of Baiada Integrated Poultry Processing Facility at 1154 Gunnedah Road, Westdale (SSD-9394).

The project includes:

- a new poultry processing facility
- retention of the existing protein Recovery Plant
- wastewater treatment plant
- advanced water treatment plan
- a new access road connected to Workshop Lane
- earthworks, and
- connection to infrastructure.

The Transport Planning Partnership (TTPP) has prepared this Construction Traffic Management Plan (CTMP) on behalf of Richard Crookes Constructions for construction of the approved development to satisfy **Condition No. B47** of the consent for SSD-9394.

This CTMP has been prepared by engineers who hold the *SafeWork NSW Work Health & Safety – Traffic Control Work (PWZ) Training Card*, as follows:

- Paul Cai – Card No. TCT0056802
- Jessica Ng (Szeto) – Card No. TCT0034755

1.2 Purpose of the CTMP

The purpose of this CTMP is to assess the traffic and pedestrian implications of the project and outline how vehicular, cyclist and pedestrian traffic and access will be managed during the construction period. This CTMP provides a structured approach to manage traffic and access during construction, to provide a safe road environment, minimise impact on the surrounding road network and maintain access for all road users and the local community.

Specifically, the purpose of this CTMP is to:

- maintain vehicle and pedestrian access to/from adjacent properties at all times
- restrict construction vehicle movements to designated routes to/from the site
- manage and control construction vehicle activity in the vicinity of the site

- provide an appropriate and convenient environment for pedestrians and cyclists around the construction site
- minimise the impact of construction activity on traffic flows, emergency vehicle access and pedestrian movements
- maintain appropriate public transport access, and
- carry out construction activity in accordance with the approved work hours.

1.3 Development Consent Conditions

The CTMP is prepared in accordance with the condition No. B47 – CTMP of SSD-9394 issued by Department of Planning, Industry and Environment.

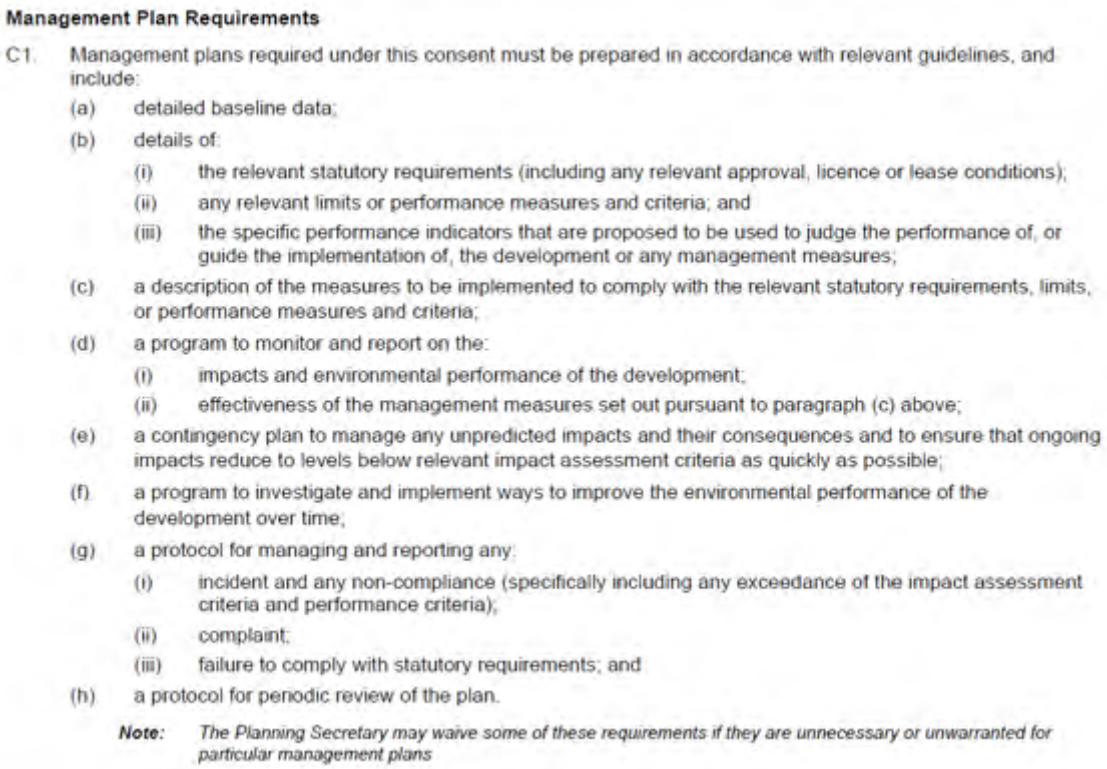
Table 1.1 describes each of the specific requirements of Condition No. B47 and provides reference to the specific section of this document that address each CTMP requirement.

Table 1.1: Consent Condition B47

Condition B25	Report Reference
Prior to the commencement of construction, the Applicant must prepare a Construction Traffic Management Plan (CTMP) for the development to the satisfaction of the Planning Secretary. The plan must form part of the CEMP required by condition C2 and must:	This Plan
a) be prepared by a suitably qualified and experienced person(s)	The report has been prepared and reviewed by engineers who hold the SafeWork NSW Work Health & Safety – Traffic Control Work (PWZ) Training Card. These details are provided in Section 1.1.
b) be prepared in consultation with TfNSW	Noted – This CTMP has been prepared in consultation with TfNSW. Further details are provided in Section 0.
c) detail the measures that are to be implemented to ensure road safety and network efficiency during construction;	Refer to Section 5
d) detail heavy vehicle routes, access and parking arrangements;	Refer to Section 3.4, 3.5 and 3.7
e) include a Driver Code of Conduct to:	Refer to Appendix D
i- minimise the impacts of earthworks and construction on the local and regional road network;	
ii- minimise conflicts with other road users;	
iii - minimise road traffic noise; and	
iv- ensure truck drivers use specified routes	
f) include a program to monitor the effectiveness of these measures; and	Refer to Section 5.11 and 5.12
g) if necessary, detail procedures for notifying surrounding businesses of any potential disruptions to routes.	Refer to Section 5.11

This plan has also been prepared in accordance with Consent Condition No.C1, as shown in Figure 1.1.

Figure 1.1: Consent Condition C1



Management Plan Requirements

C1. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:

(a) detailed baseline data;

(b) details of:

(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);

(ii) any relevant limits or performance measures and criteria; and

(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;

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

(d) a program to monitor and report on the:

(i) impacts and environmental performance of the development;

(ii) effectiveness of the management measures set out pursuant to paragraph (c) above;

(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;

(f) a program to investigate and implement ways to improve the environmental performance of the development over time;

(g) a protocol for managing and reporting any:

(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);

(ii) complaint;

(iii) failure to comply with statutory requirements; and

(h) a protocol for periodic review of the plan.

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

1.4 Consultation Summary

TTPP has prepared this CTMP in consultation with TfNSW.

This CTMP has been updated following feedback received from TfNSW on 18 May 2023, as detailed in Table 1.2, and further feedback received from TfNSW on 5 June 2023, as detailed in Table 1.3.

Table 1.2: Response to TfNSW Comments Received on 18 May 2023

TfNSW Comment	TTPP Response
1. TfNSW notes that during stage one of the construction phase, it is proposed that the Oxley Highway (HW11) will be used for access and egress. In line with consent condition B47(c), the increase in vehicle movements, the number of vehicles entering / exiting from either direction, and the spill should be documented to ensure intersection performance is maintained.	This CTMP has been updated with further details provided in Section 4.1.1. Traffic modelling has been undertaken, which demonstrates that intersection performance is maintained during this construction stage on Oxley Highway.
2. The construction Traffic Management Plan and supporting Traffic Guidance Scheme are to be prepared and implemented by suitably qualified persons. The author and their qualifications need to be included in the CTMP to validate the plan, as outlined in condition B47(a) of the development consent.	This has been updated and provided in Appendix C.
3. If the existing access from Oxley Highway is to be used for the purpose of site access during stage one, the access must comply with Austroads Guide to Temporary Traffic Management (AGTTM) or Traffic Control at Worksites Manual (TCWS).	This has been updated and provided in Appendix C.

4. The CTMP should include how the existing access it to be managed during the delivery of stage one through the use of Temporary Traffic Management.	This has been updated and provided in Appendix C.
5. Table 4.1 of the CTMP identifies approximately 220 trips of both heavy and light vehicles entering and exiting the location (3.6 Construction Vehicle Types). TfNSW notes that all movements in and out of the site are provided at one intersection. The safety and efficiency impacts of this should be considered and included in the CTMP, as specified in condition B47(c) of the development consent.	As per Point 1. This CTMP has been updated with further details provided in Section 4.1.1.
6. Based on the traffic generation, a site specific Traffic Guidance Scheme (TGS) would be required and overlayed with a Vehicle Management Plan. It is noted, a Road Occupancy License (ROL) will be required for stage one where the risk assessment of the existing access determines Temporary Traffic Management (TTM) is required.	The swept path assessment is provided in Appendix B, with the Traffic Guidance Scheme provided in Appendix C. The Contractor shall be responsible to obtain all relevant ROL permits as necessary.
7. Truck symbolic (W5-22) & Truck symbolic (T2-25) must be used when roadworks generate greater than 20 truck turning movements per day and may be used in conjunction with sign (W8-207). Note: The sign (T2-25) is restricted to short term work only.	This has been updated and provided in Appendix C.
8. Part 6 (conclusion) will need to include assessment/ impacts and outcomes with respects to the utilisation of the existing access and the Oxley Highway during delivery of stage one.	This has been updated accordingly and is provided in Section 6.

Table 1.3: Response to TfNSW Comments Received on 5 June 2023

TfNSW Comment	TTPP Response
1. TfNSW notes that once the new access road, Workshop Lane, is constructed, the existing access from Oxley Highway will continue to be used. The CTMP does not indicate how this access will be managed to ensure only the intended vehicles will enter and exit, particularly during the construction phase. This should be outlined in the CTMP.	Once the new access road and Workshop Lane is constructed, use of the existing access from Oxley Highway during the remainder of the construction phase will be limited to operational traffic to and from the existing rendering plant. Further management details are provided in Section 3.4 and 5.2.
2. TfNSW notes that in Part 1.3 – Development Consent Conditions, Table 1.1, the suitably qualified person(s) hold a Roads and Maritime Services Prepare a Work Zone Traffic Management Plan (PWZTMP) card. From July 1, 2020, PWZTMP cards were no longer issued by TfNSW (formerly RMS). They are now issued by SafeWork NSW and are called a Traffic Control Work Training Card (TCT). Any persons holding a PWZTMP qualification were required to update their status and apply for a SafeWork card. More information on this can be found on the SafeWork NSW website.	This has been updated with details provided in Section 1.1.
3. TfNSW advises that section 3.3.6 - TMP approval and review scheduling outlined in the Traffic Control at Worksites Manual (TCWS) will need to be followed to ensure the CTMP is sufficient.	Noted. The Contractor shall be responsible to comply and satisfy with all requirements as set out in this CTMP, and the Traffic Control and Worksites Manual (TCWS). This is further detailed in Section 5.4.

2 Existing Conditions

2.1 Site Description

The subject site is located at 1154 Gunnedah Road, Westdale, approximately 9 km west of Tamworth. The site has a road frontage to Oxley Highway (also known as Gunnedah Road), with an existing vehicle crossing off Oxley Highway and an internal roadway to the existing rendering plant on the site.

The initial construction activities involve construction of a new vehicular access road extending between the existing cul de sac of Workshop Lane and the site.

The location of the site and the new access road are shown in Figure 2.1.

Figure 2.1: Location Plan

Base Map Source: Nearmap

2.2 Road Network

Oxley Highway forms part of the HW11 State road link between Port Macquarie in the east and Nevertire in the west, via Tamworth, Gunnedah and Coonabarabran. In the vicinity of the site, Oxley Highway is known as **Gunnedah Road**, and has a single travel lane in each direction and sealed shoulders. The posted speed limit is 100 km/h.

The subject site has direct access to Gunnedah Road via a T-intersection. At the intersection, Gunnedah Road is locally widened to provide a right turn deceleration and storage lane for vehicles entering the site. The intersection treatment is generally consistent with an Austroads Channelised Right Turn (CHR) treatment in Gunnedah Road, which allows through traffic to pass around vehicles that have slowed to turn in to the site.

Through Tamworth, Oxley Highway is also known as Duri Road, Bridge Street, Brisbane Street, and Marius Street. Gunnedah Road crosses the Main Northern Railway just to the west of its intersection with Duri Road, at a road over rail crossing.

Wallamore Road provides a connection between Gunnedah Road west of Tamworth and Manilla Road via **Appleby Lane**, following the alignment of the West Tamworth Barraba Railway. Wallamore Road has a single travel lane in each direction, typically with dashed centre linemarking or no centre linemarking, and localised widening at major intersections and accesses. Wallamore Road has a posted speed limit of 80 km/h west of Kingsford Smith Street.

Goddard Lane is a local road which links Oxley Highway/Gunnedah Road and Wallamore Road, and has a single travel lane in each direction, with dashed centre linemarking and a wide sealed carriageway. At the intersection of Goddard Lane with Oxley Highway/Gunnedah Road, an auxiliary right turn (AUR) and an auxiliary left turn treatment (AUL) are provided in Gunnedah Road. A westbound acceleration lane is also provided for vehicles exiting Goddard Lane onto Oxley Highway.

At the intersection of Goddard Lane with Wallamore Road, an auxiliary right turn (AUR) and an auxiliary left turn (AUL) treatment are provided in Wallamore Road.

Goddard Lane provides access to the West Tamworth Glen Artney Industrial Estate, which includes **Armstrong Street**, **Ponda Rosa Road**, and **Phoenix Street**. These roads are each constructed with a wide carriageway and single travel lane in each direction, suitable for use by heavy vehicles including 25/26m B-doubles. Armstrong Street, Goddard Lane and Phoenix Street are also included in the approved Type 1 A-double road network.

2.3 Public Transport

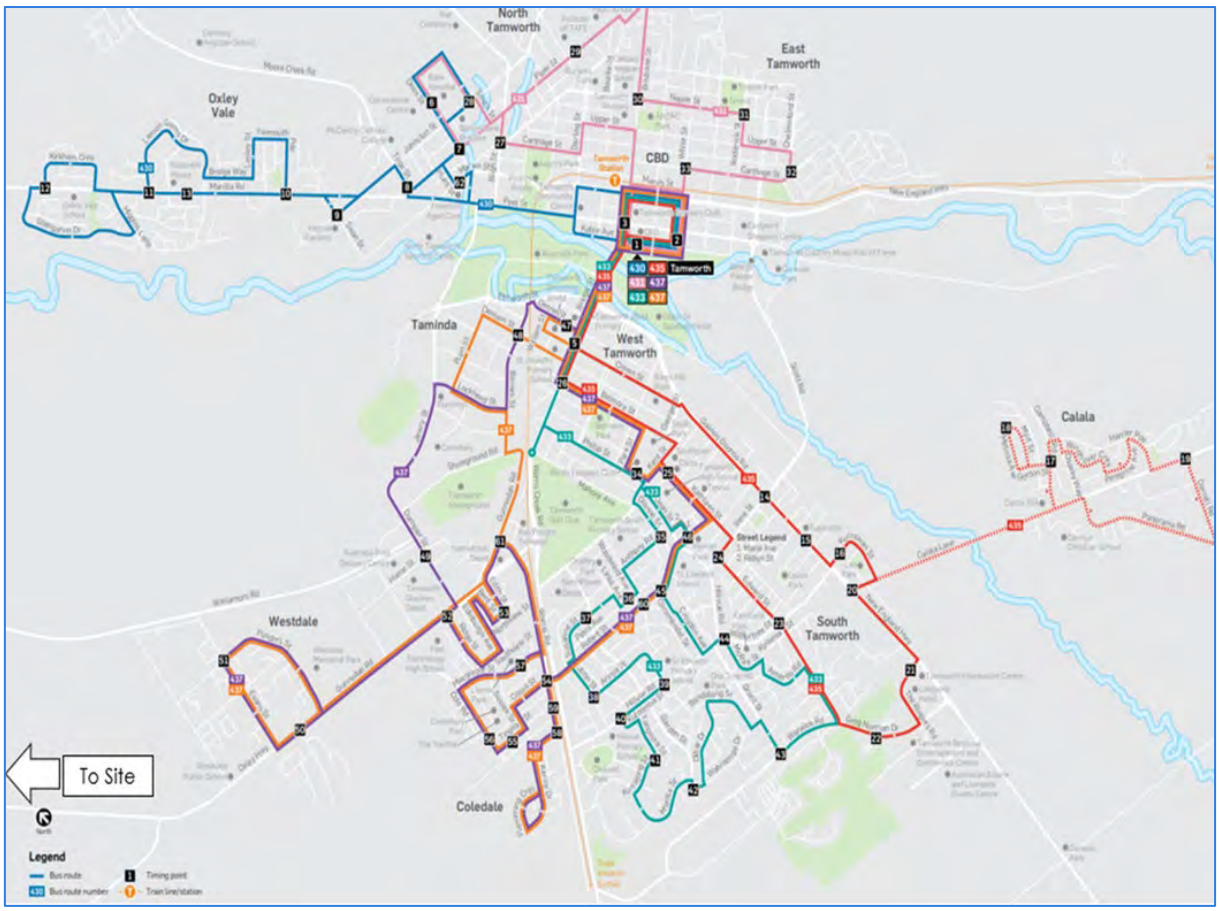
The existing public transport services in the region have been reviewed with regard to the site's accessibility by public transport. Table 2.1 summarises the existing bus and rail services and frequencies in the region. Figure 2.2 presents the bus routes.

The site is not well located to existing public transport services. Bus Route 437 is the closest service to the site, traveling from Tamworth along Gunnedah Road as far as Evans Street at Westdale, over 5 km from the site.

Table 2.1: Public Transport Facilities

Service	Route	Route Description	Proximity to Site (km)	Frequency	
				Weekday AM	Weekday PM
Rail	North Western NSW	Sydney to Armidale	11.5	No service	1 service
		Armidale to Sydney		1 service	No service
Bus	428	Quirindi to Tamworth	9.2	3 services	3 services
	430	Oxley Vale via Hospital	10.8	6 services	9 services
	431	North and East via Hospital	10.7	2 services	3 services
	433	South 2 Dibar Drive	9.2	5 services	7 services
	435	South 1	9.2	6 services	6 services
	437A	Westdale and Coledale via Taminda	5.4	4 services	No service
	437B	Coledale and Westdale via Taminda	5.4	No service	6 services
	443	Manilla to Tamworth	11.5	1 service	1 service
	444	Bendemeer to Tamworth	11.5	Up to 2 services	Up to 2 services

Figure 2.2: Tamworth Bus Guide Map



3 Proposed Construction Activities

This section of the report outlines the proposed construction methodology.

3.1 Description of Works

The proposed construction activities shall be staged across three stages, that being:

- **Stage 1 Early Works**
  - Construction of a new access road from Workshop Lane to the southeast corner of the site
  - Site establishment
- **Stage 2 Early Works**
  - Bulk earthworks
  - Relocation and / or diversion of services
  - Construction of gatehouse precinct – building and weighbridges
- **Stage 3 Main Works**
  - Construction of all new buildings
  - Infrastructure services
  - Construction of remaining hardstand areas and internal access roads
  - Landscaping and Installation of car park areas.

The extent of the work site will be wholly contained within the site boundary. Any impact to the surrounding road network is expected to be minimal and to be managed accordingly.

The site layout plan is provided in Appendix A.

3.2 Duration and Staging of Works

The construction is expected to commence in May 2023 and be completed by August 2025, for a total period of 28 months.

Construction of the new access road will be undertaken initially.

Once the new access is commissioned, the rest of the Stage 1 and Stage 2 construction works (including site demolition, establishment works and earthworks) will then be conducted within the site. The Stage 3 main construction works will occur after the early preparation works.

The indicative construction staging and estimated duration of construction is summarised in Table 3.1.

Table 3.1: Indicative Construction Program

Construction Activities	Start Date	End Date	Duration (months)
Stage 1 – Establishment and Road Works	May 2023	September 2023	5
Stage 2 – Earthworks and related works	June 2023	November 2023	6
Stage 3 – Main construction works	October 2023	August 2025	23
Total	**May 2023**	**August 2025**	**28**

3.3 Construction Work Hours

Construction works will be carried out in accordance with the approved work hours specified in the conditions of consent for the development. Consent condition B1 (SSD-9394) specifies the following work hours:

- Monday to Friday 7am-6pm
- Saturday 8am-1pm, and
- Sunday and Public Holiday No work.

Works outside of the hours identified in Condition B1 may be undertaken in the following circumstances:

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

Any works outside these times will only occur with approval from the relevant authorities (i.e. Council / TfNSW), prior to the commencement of any works.

3.4 Construction Site Access Arrangements

Construction vehicles accessing the site will principally travel directly to and from the new access location via Armstrong Street and Workshop Lane.

For approximately four to five months during the early stages of construction of the new access road, the existing site access driveway on Oxley Highway will be used as a secondary

access by construction traffic, including construction workers access to on-site parking as the new access road would not be built yet. At the intersection, Oxley Highway is locally widened to provide a channelised right turn deceleration and storage lane for westbound vehicles entering the site. That access is currently used by heavy vehicles for the existing rendering plant, up to and including B-doubles.

It is anticipated that there will be only small volumes of heavy vehicles (up to three to five trucks per day) accessing the site via the existing site access during construction of the new access road. The majority of the heavy vehicles would travel to and depart from the new access road construction area via Workshop Lane. Once the new access road is constructed to suitably carry heavy vehicles, all construction traffic will access the site via the new access road only.

Once the new access road has been built, use of the existing site access on Oxley Highway during the remainder of the construction phase will be restricted to operational traffic of the exiting rendering plant only. That is, no construction vehicles will be able to use the existing Oxley Highway access.

Construction workers and heavy vehicle drivers will be informed of the updated access arrangements during site induction and regular meetings. Additionally, the Site Manager will be responsible to manage and oversee all traffic movements in and out of the site to ensure that no construction vehicle movements use the existing Oxley Highway site access during this time.

The location of the new site access via the new road is shown in Figure 3.1, and the secondary site access via the existing site access on Oxley Highway is shown in Figure 3.2

The new access road will be designed to accommodate vehicles up to and including a 25m long B-double vehicle. All construction vehicles are required to enter and exit the site in a forward direction. Richard Crookes Constructions will be responsible for liaising with relevant authorities to organise relevant approvals accordingly.

TTPP's swept path assessment of the proposed site access arrangements is provided in Appendix B.

Figure 3.1: Principal Site Access via New Access Road

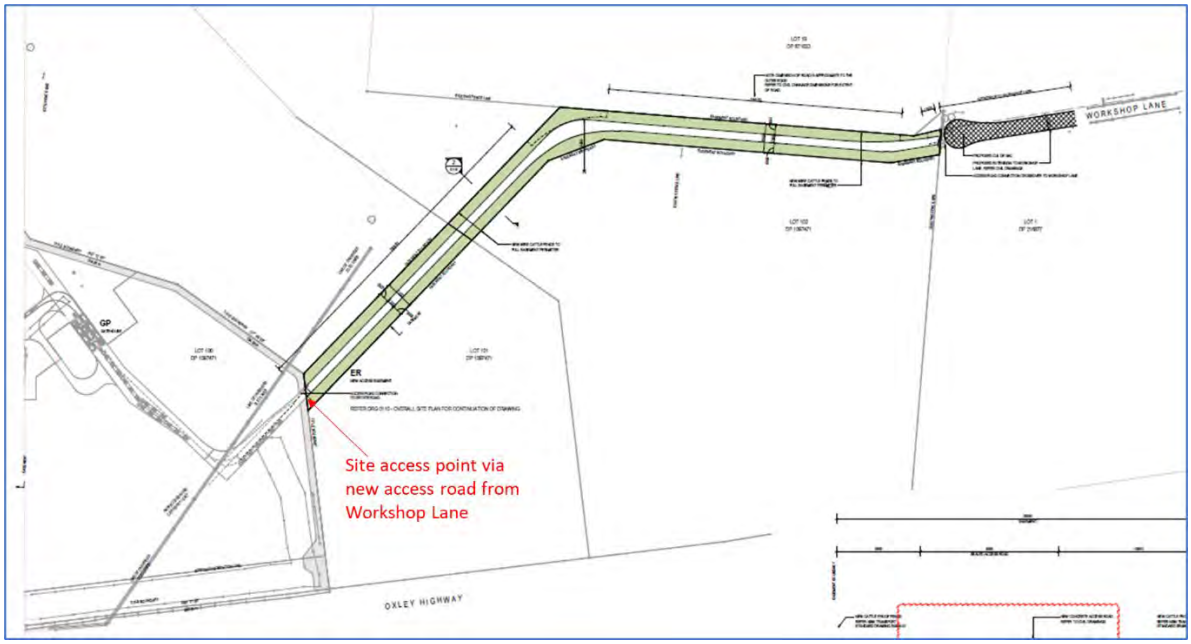


Figure 3.2: Secondary Site Access via Existing Driveway off Oxley Highway

3.5 Construction Vehicle Routes

Dedicated construction vehicle routes have been developed to provide the shortest distances to/from the arterial road network, whilst minimising the impact of construction traffic on streets within the immediate vicinity of the site.

During construction of the new access road (Stage 1), access will be provided via the existing Oxley Highway site access. Construction vehicle access will be restricted to minimise impacts on the surrounding road network during this stage.

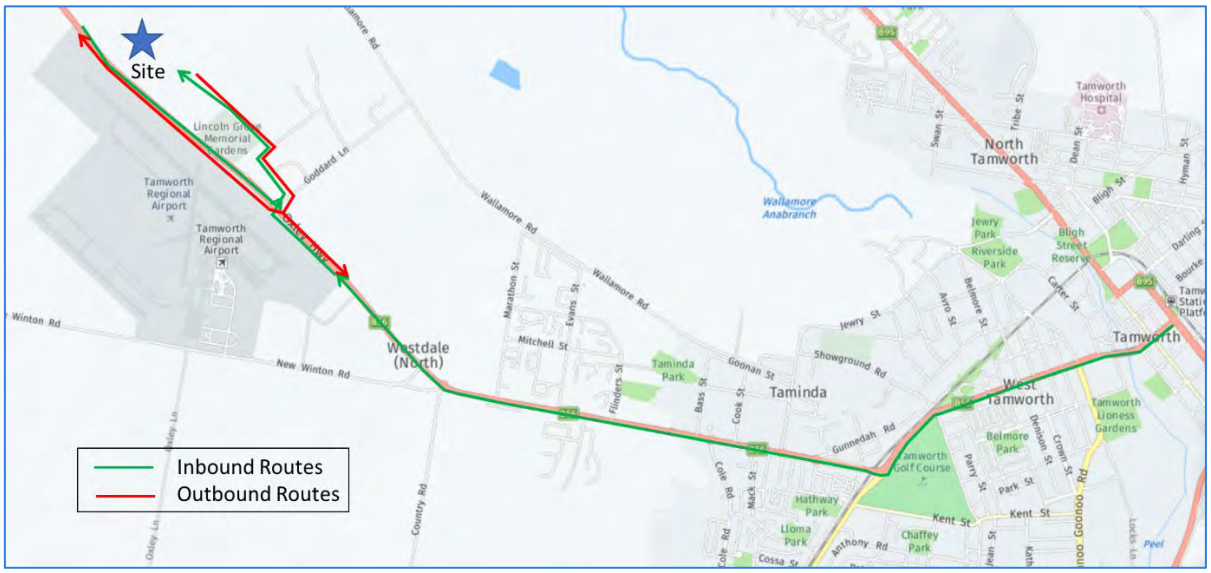
Once the new access road from Workshop Lane is commissioned, all vehicles generated by the construction activity will access the site via the new access road off Workshop Lane.

Construction vehicles will travel to and from the construction site via Workshop Lane, Armstrong Street and Goddard Lane. Construction vehicles will travel to and from Goddard Lane via Oxley Highway (known as Gunnedah Road adjacent to the site). It is noted that the existing roads for the site (including Oxley Highway, Goddard Lane and Armstrong Street) are those of the purpose-built West Tamworth Glen Artley industrial subdivision, which are approved for use by B-doubles[1].

Although the partially constructed Workshop Lane is not included in the currently-approved B-double routes, it is constructed to a similar standard as Armstrong Street. Therefore the proposed site access roads will be suitable to accommodate the construction vehicles without additional treatment.

The nominated principal approach and departure routes for construction vehicles are shown in Figure 3.3. All truck drivers will be advised of the designated truck routes to/from the site and be required to adhere to the nominated routes.

Figure 3.3: Principal Construction Vehicle Routes



Base Map Source: Google Maps

Prior to completion of the new access road to a standard suitable for heavy vehicle use, construction vehicles including minor heavy vehicles and construction workers' passenger

[1] https://roads-waterways.transport.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/map/index.html

vehicles would need to utilise the existing driveway off Oxley Highway to access the site. This route is nominated as a secondary route prior commission of the new access road. At the intersection, Oxley Highway is locally widened to provide a channelised right turn deceleration and storage lane for vehicles entering the site. The intersection treatment is generally consistent with an Austroads Channelised Right Turn (CHR) treatment in Oxley Highway, which moves the slower turning vehicles from the through traffic stream. The intersection is currently used by heavy vehicles up to and including B-doubles entering and exiting the existing rendering plant on the site, and is suitable for use by the construction heavy vehicles without additional treatments

The secondary approach and departure routes for construction vehicles prior to completion of the new access road are shown in Figure 3.3.

All truck drivers will be advised of the permitted truck routes to/from the site and be required to adhere to the designated routes.

Figure 3.4: Secondary Construction Vehicle Routes – Prior to New Access Road Commissioning

Base Map Source: Google Maps

3.6 Construction Vehicle Types

Construction vehicles likely to be generated by the construction activities include:

- Semi-trailer, truck and dog and B-double vehicles for larger delivers, and
- Heavy to small rigid vehicles and concrete mixers/trucks for remaining construction activities and deliveries.

A range of plant and equipment will be required for the construction of the project.

During Stages 1 and 2, construction works will also require dump trucks, dozers, compactors, excavators, loaders and scrapers. These will only be transported to the site at the start of the work and be transported from the site at the end of the work. That is, the delivery of machinery will not occur on a daily basis.

During the main works, numerous types of trucks ranging from standard rigid trucks, concrete mixers, semi-trailers and B-doubles will be used to deliver concrete, steel, service materials, plant items and construction materials to the site.

TTPP has undertaken swept path analysis using the largest vehicle (B-double) expected during the works, which demonstrates appropriate access to/from the site. This is enclosed in Appendix B.

3.7 Staffing and Parking Arrangements

It is expected that up to 100 construction workers will be on site each day during the early works (Stage 1 and 2), and up to 350 construction workers on site each day during main works (Stage 3). The construction workforce would be significantly fewer people than the forecast operational workforce at the processing plant (i.e. approximately 1,000 to 1,200 staff).

Adequate parking will be made available within the site during the course of the works for all construction workforce and delivery vehicles, so construction traffic would not impact on local on-street parking conditions. All workers will however be encouraged to carpool to travel to/from the site to minimise parking and traffic impacts during construction. This will be incorporated into the site induction program.

3.8 Materials and Handling Area

All materials handling and plant equipment, including waste storage, shall be wholly stored on-site within the enclosed construction area. It is not expected that any public road will be required for such purposes. However, if temporary use of any public road is required for temporary storage purposes or the like, prior consultation with Council will be undertaken. All relevant permit approvals will also be obtained prior to the commencement of such activities.

3.9 Road Occupancy License Requirements

Any construction activities that will impact on the operational efficiency of the State road network will require a road occupancy license (ROL) prior to the commencement of such construction activities.

Richard Crookes Constructions will be responsible for obtaining all relevant ROLs as necessary. This would be a separate application to this CTMP. The Contractor shall be responsible to obtain all necessary ROL's as required.

4 Construction Traffic Assessment and Implications

4.1 Construction Traffic Generation

The estimated vehicle movements associated with each stage of the construction works are summarised in Table 4.1.

Table 4.1: Summary of Construction Traffic Trips

Construction Activities	Duration	Daily construction truck trips (heavy vehicles)	Daily construction workforce trips (light vehicles)	Total Daily Vehicle Trips
Stage 1 – Establishment and Road Works	5 months	20 trips	Up to 200 trips	Up to 220 trips
Stage 2 – Earthworks and related works	6 months	20 trips	Up to 200 trips	Up to 220 trips
Stage 3 – Main construction works	23 months	20 trips	Up to 700 trips	Up to 720 trips

Note: A trip is a one-way movement, one vehicle arriving then departing the site generates two vehicle trips.

The proposed construction activity is expected to generate up to 720 vehicle trips per day during peak construction works (i.e. main works). It is however noted that of those 720 trips, 700 are expected to be generated by workers, i.e. 350 workers during peak construction – which has been conservatively assumed that all construction workers will drive (alone) to the site. In reality, it is expected that some workers will carpool with others to/from the site, which will reduce the overall number of trips generated. Car pooling will be encouraged as part of the site induction program.

Peak vehicle trips will typically occur at the start of the day when the majority of the construction workforce arrive on site and at the end of the day when the workforce leave the site. The typical work hours will be between 7 am and 6 pm from Monday to Friday. It is expected that the morning peak will occur before 7 am and the evening peak will occur after 6 pm. Therefore, the peak vehicle movements generated by construction activities will be earlier than the network morning peak hour (8 am to 9 am) and later than the network afternoon peak hour (3 pm to 4 pm) on a weekday.

Heavy vehicles visiting and departing the site will be spread throughout the construction hours between 7 am and 6 pm from Monday to Friday, and between 8 am and 1 pm on Saturday.

As shown in the Road Transport Assessment report[2] prepared by TTPP for the development application, operation of the processing plant is expected to generate about 408 heavy

[2] The Transport Planning Partnership (20 June 2019), *Oakburn Poultry Processing Plant – Road Transport Assessment.*

vehicle trips and about 1,966 light vehicle trips per day. The number of heavy vehicle trips generated during all phases of construction will be significantly lower than the heavy vehicle trips expected to be generated by the processing plant when operational. Similarly, the number of light vehicle trips generated during the construction activity is anticipated to be significantly lower than the traffic generated by the operational processing plant.

The Road Transport Assessment report prepared by TTPP found that the traffic generated by the processing plant can generally be accommodated by the existing road network, without requiring any specific measures to address safety or capacity concerns. Considering that construction vehicles will use the same access routes as the operational traffic, and the number of trips generated during the construction stage will be significantly lower than during the operational stage, separate assessment of the impacts of construction traffic on the operation of the surrounding road network is not warranted. The construction traffic is not expected to have noticeable impacts on the existing road network.

4.1.1 Impacts on Existing Site Access off Oxley Highway in Early Stage

Prior to completion of the new access road during Stage 1 works, temporary construction access via the existing site access off Oxley Highway is necessary to facilitate construction works. It is anticipated that there will be up to 50 light vehicles (construction workforce) and three to five heavy vehicles per day utilising the existing Oxley Highway access.

As the typical work hours will be between 7 am and 6 pm from Monday to Friday, it is assumed the morning peak traffic generated by the construction workforce would occur between approximately 6:30 am and 7:30 am, and the evening peak would occur between approximately 5:30 pm and 6:30 pm.

TTPP has assessed the impacts associated with the anticipated construction vehicle numbers at the existing Oxley Highway site access using SIDRA traffic analysis, with results shown in Table 4.2. This traffic analysis has been based on intersection surveys undertaken on Wednesday 27 June 2018 as part of the previous Road Transport Assessment for the project.

It has been conservatively assumed that there will be 50 light vehicles (40 approaching from the east and 10 approaching from the west) and two heavy vehicles (approaching from the east) inbound and one heavy vehicle (departing to the east) outbound during the AM Peak (6:30am – 7:30am). Similarly, it has been assumed that there will be 50 light vehicles (40 departing to the east and 10 departing to the west) and two heavy vehicles (departing to the east) leaving the site during the PM Peak (5:30pm – 6:30pm).

The results of the SIDRA analyses are summarised in Table 4.2, and full movement summaries are provided in Appendix E.

Table 4.2: Oxley Highway and Baiada Site Access – SIDRA Analysis Summary

Scenario	AM Peak (6:30 am – 7:30 am)			PM Peak (5:30 pm – 6:30 pm)		
	Degree of Saturation	Average Delay	Level of Service	Degree of Saturation	Average Delay	Level of Service
Existing No Construction Traffic	0.07	6.6	A	0.07	6.7	A
Future With Construction Traffic	0.07	6.8	A	0.07	6.8	A

Average delay is in seconds per vehicle for the movement with the highest average delay per vehicle.

Table 4.2 indicates that with the construction traffic as described above, the existing Oxley Highway access will continue to operate at Level of Service A during both AM and PM peaks. Level of Service A indicates that the intersection operates satisfactorily, with acceptable delays and spare capacity. The construction traffic would have negligible impact on the delays experienced by drivers using the intersection.

Drivers travelling along Oxley Highway past the intersection will experience no increase in delays as a result of the construction traffic during the peak hours.

On this basis, the proposed construction impacts on Oxley Highway during Stage 1 are expected to be acceptable from a traffic capacity perspective.

A Traffic Guidance Scheme (TGS) has also been prepared in accordance with TfNSW's *Traffic Control at Work Sites Manual* for the use of existing site access by construction vehicles, with advisory truck turning signs on Oxley Highway to warn drivers approaching the T-intersection of truck turning. The TGS is provided in Appendix C.

4.2 Pedestrian and Cycle Access

Pedestrian and cycle safety will be maintained at all times. There will be site fencing installed around the construction area, to ensure pedestrian safety around the work area.

4.3 Public Transport Facilities

The proposed construction activities will not impact existing public transport services. All existing bus facilities and bus stops will be maintained at all times during the works.

4.4 Emergency Vehicles

No special provisions for emergency service vehicles are required as part of the proposed construction works. Emergency vehicle access will be maintained at all times.

4.5 Adjoining Properties and Local Access

The proposed construction works will not impact existing local access to/from properties. Local access to properties will be maintained at all times during the works. Additionally, during extension works to the existing Workshop Lane, access to/from the existing cemetery (Lincoln Grove Memorial Gardens) in Workshop Lane will be maintained at all times.

5 Construction Traffic Management Measures

5.1 Traffic Guidance Scheme

A site-specific TGS has been prepared in accordance with TfNSW's *Traffic Control at Work Sites Manual.* The TGS is provided in Appendix C.

Advisory truck turning signs will be installed on Armstrong Street near the intersection with Workshop Lane and at the existing Oxley Highway site access to warn drivers approaching the intersections of truck turning.

All advisory signage will be installed in accordance with *AS1742.3 Manual of uniform traffic control devices – Traffic control devices for works on roads* and the *Traffic Control at Worksites Manual*. Signs will be installed and maintained throughout on days that truck movements are scheduled to occur.

Temporary traffic controls will be inspected by Richard Crookes Constructions prior to construction works commencing to identify potential safety hazards and enable implementation of corrective solutions. The Site Supervisor will check all relevant traffic control management measures are in place prior to commencement of works.

5.2 Vehicle Access

Construction vehicle drivers will radio / call the site office on approach to the site to ensure access to the works site is available. All loading and unloading will be undertaken within the site during the approved work hours. As noted previously, the queuing or marshalling of construction vehicles will not be permitted on public roads.

Furthermore, as noted previously, once the new access road has been built, no construction vehicles will be permitted to use the existing Oxley Highway site access. The Site Manager will be responsible to manage and oversee all traffic movements to/from the site to ensure compliance.

Notwithstanding this, if there are any materials spilt onto the road, site personnel and equipment will appropriately rectify the issue, subject to appropriate Work Health and Safety (WHS) provisions.

5.3 Truck Routes

Protocols must be in place to ensure that:

- site induction includes procedures for accessing the site
- drivers adhere to the nominated truck routes, as shown in Figure 3.3
- drivers are aware of pedestrians and cyclists in the immediate vicinity of the site
- drivers are aware of the sign posted speed limits.

5.4 Site Inspections and Record Keeping

The construction operation will be monitored to ensure that it proceeds as set out in the Construction Management Plan provided by Richard Crookes Constructions. A daily inspection before the start of construction activity will take place to ensure that conditions accord with those stipulated in the plan and that there are no potential hazards.

A review of the CTMP must occur at least every 12 months or where any on-site or works changes occur, to ensure that the CTMP is kept up to date. Any changes will be made by an appropriately qualified person and recorded accordingly. 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 site manager or the person responsible for the works.

The Contractor shall be responsible to implement the traffic control measures as identified in the CTMP and monitor the effectiveness of the traffic control measures in accordance with the Traffic Control at Worksites Manual (TCWS).

5.5 Site Induction

All construction workers employed on the site will be required to undergo a site induction. The induction will include permitted access routes to and from the work site for site personnel and construction vehicles as well as standard environmental, WHS, driver protocols and emergency protocols.

5.6 Heavy Vehicle Load Requirements

All drivers will be required to adhere with the posted vehicle load limits on all roads and not overload vehicles beyond its maximum loading limits and/or relevant approvals.

5.7 Spoil Management

Truck wheels will be washed prior to exiting the site to avoid tracking any spoil onto adjacent roadways. Street sweepers will be used where required. The roadway (including footpath) will be kept in a serviceable condition for the duration of demolition. Remedial treatments such as patching will be undertaken at the direction of Council.

5.8 Driver Code of Conduct

All drivers employed on the project, whether direct employees or not, have a responsibility to drive safely, comply with State road regulations and the Australian Road Rules and any other directives issued by Richard Crookes Constructions. In particular, before any deliveries are undertaken all heavy vehicle drivers will be required to read and endorse the Driver's Code of Conduct.

To reinforce these obligations a Driver's Code of Conduct has been prepared and is included in Appendix D.

5.9 Traffic Impact Reduction Strategy

A range of measures will be applied to encourage carpooling to/from the site, including:

- provision of car parking spaces within the site, with car parking spaces allocated to employees
- education of personnel to strongly encourage carpooling
- project induction to reinforce themes regarding parking allotments, carpooling and courteous and professional behaviour when leaving and accessing the site.

5.10 Managing Construction Worker Parking

To manage construction worker car parking, it is proposed to implement the following measures to encourage workers to use public transport and/or carpool:

- provide an on-site tool drop-off and storage facility to allow tradespeople to drop off and store their tools/specific machinery for the project
- inform staff and workers during the induction and regular management meetings of on-site parking arrangements and that no staff at any given time should park on surrounding streets
- encourage staff and workers to carpool to access the site during the induction and regular management meetings.

5.11 Liaison with Stakeholders

Richard Crookes Constructions will manage all community queries and/or issues relating to the project for actioning, as necessary. Written notification will be provided to likely and potentially affected sensitive receivers prior to commencement of any activities associated with construction. This will include local residents, local businesses and relevant authorities.

The Community Liaison Manager will be responsible to manage all community queries, including to notify all relevant stakeholders. The format of notification may include such measures such as email notification or letter box drops.

5.12 Incident Response Management Plan

An Incident Response Plan will be developed by Richard Crookes Constructions to include all operating procedures for management emergencies and unplanned incident during construction. In addition to this, this Incident Response Plan will include strategies and measures to respond to any emergency repair requirement or maintenance issues.

The Incident Response Plan will identify and define the roles and responsibilities of the relevant project personnel and outline the communication protocols and systems during an emergency and unplanned incident. Formal arrangements will be in place for the review and maintenance of the Incident Response Management Plan.

6 Conclusion

The key findings of the assessment are as follows:

- The proposed construction activities include:
  - Stage 1 – new access road and site establishment
  - Stage 2 – bulk earthworks, relocation of services, and gatehouse precinct construction
  - Stage 3 – main buildings, internal roads, car park and landscaping
- The proposed works are anticipated to be undertaken over approximately 28 months.
- The proposed construction works will be fully contained within the new access road and the site, and will not cause any noticeable impacts on the surrounding road network.
- On-site parking will be provided for construction workers.
- All loading/unloading activities will occur within the site and along the new site access road, no delivery truck parking will occur on the public roads.
- Construction vehicles will use the existing site access on Oxley Highway as a secondary access in Stage 1 prior to completion of the new access road. The anticipated construction traffic can be accommodated by the existing intersection treatments with negligible impacts on the surrounding road network. Traffic modelling indicates that the existing intersection of Oxley Highway with the site access will continue to operate satisfactorily at Level of Service A during the peak periods for traffic generated by the construction activity.
- Once the new access road is constructed to suitably carry heavy vehicles, all construction traffic will access the site via the new access road.
- Construction vehicle movements to and from the site can be accommodated by the surrounding road network.
- Construction works and construction vehicle movements will not result in any adverse safety or operational impacts on the surrounding road network, pedestrians and cyclists, public transport capacity, and emergency services.
- Driver protocols would be established as part of the site induction procedure for drivers to ensure the safety of road users.

In summary, it is concluded that the proposed traffic control measures will adequately address potential implications associated with proposed construction activities. This CTMP fulfils the requirements of **Condition No. B47** for SSD-9394.

Appendix A

Site Plan

PAVEMENT LEGEND

BIT.	HOT MIX BITUMEN
CONC.	CONCRETE FOR HEAVY VEHICLES
EX-CONC.	EXISTING CONCRETE

HEAVY DUTY CONCRETE (25,515sqm)

EXISTING CONCRETE (6,525sqm)

LIGHT DUTY PAVEMENT (36,000sqm)

SBA ARCHITECTS
Commercial Industrial Residential Retail Interior Design
Suite 702, 83 Mount Street, North Sydney NSW 2060
T 02 9929 9988 F 02 9929 8899
E info@sbaarch.com.au W www.sbaarch.com.au

ISSUE REV. DESCRIPTION DATE

CLIENT

OAKBURN PROCESSING PLANT

OXLEY HIGHWAY, TAMWORTH

DRAWING TITLE

SITE PLAN

DATE	SCALE	JOB NO.	DRAWING NO.	
22.06.20	1:2000@A1	19106	SK 10	F

PAVEMENT LEGEND

BIT.	HOT MIX BITUMEN
CONC.	CONCRETE FOR HEAVY VEHICLES
EX-CONC.	EXISTING CONCRETE

STAGE 1 - SITE COMPOUND, WORKSHOP, LANE EXTENSION, INTERNAL ACCESS ROADS TO EXISTING RENDERING BUILDING

STAGE 2 - BULK EARTHWORKS, SITE PREPARATION, DETENTION BASINS, PERIMETER LANDSCAPE, SCREENING MOUNDS AND PLANTING

STAGE 3 - PROCESSING BUILDING, CARPARK & ROADS, OFFICE BUILDING, MAINTENANCE, WASTE WATER TREATMENT, PLANT BUILDINGS, PONDS

SBA ARCHITECTS
Commercial Industrial Residential Retail Interior Design
Suite 702, 83 Mount Street, North Sydney NSW 2060
T 02 9929 9988 F 02 9929 8899
E info@sbaarch.com.au W www.sbaarch.com.au

ISSUE REV. DESCRIPTION DATE

CLIENT

OAKBURN PROCESSING PLANT

OXLEY HIGHWAY, TAMWORTH

DRAWING TITLE
STAGING PLAN

DATE	SCALE	JOB NO.	DRAWING NO.	
22.06.20	1:2000@A1	19106	SK 16	A

Appendix B

TTPP Swept Path Assessment

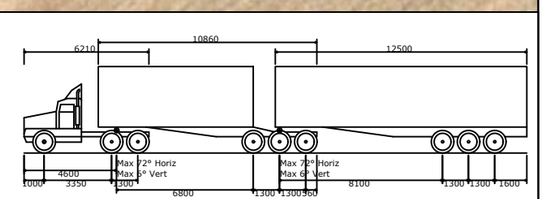
ARMSTRONG STREET

GODDARD LANE

OXLEY HIGHWAY

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



B-Double (25.0m)

Overall Length	25000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	HT	PC	PD	29/03/23

ttpp transport planning

PROJECT

1154 GUNNEDAH ROAD, WESTDALE
OAKBURN PROCESSING FACILITY

TITLE

SWEPT PATH ANALYSIS
25m B-DOUBLE VEHICLE

DWG No. 22514CAD003
FIGURE _1

DATE STAMP 29 MARCH 2023

PROJECT No.	SCALE	REV.
22514	1:700 @A3	A

Date: 29 March 2023

Filename: 22514CAD003-230329-SWEPT PATH.dwg

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		

B-Double (25.0m)

Overall Length	25000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	HT	PC	PD	29/03/23

ttpp transport planning

PROJECT

1154 GUNNEDAH ROAD, WESTDALE
OAKBURN PROCESSING FACILITY

TITLE

SWEPT PATH ANALYSIS
25m B-DOUBLE VEHICLE

DWG No. 22514CAD003
FIGURE _2

DATE STAMP 29 MARCH 2023

PROJECT No.	SCALE	REV.
22514	1:700 @A3	A

Filename: 22514CAD003-230329-SWEPT PATH.dwg

Date: 29 March 2023

8996

NEW WIRE CATTLE FENCE TO FULL EASEMENT PERIMETER

OT 102
97471

EASEMENT BOUNDARY

11500

EXTENSION TO WORKSHOP LANE

EXISTING FENCE LINE

PROPOSED CUL DE SAC

PROPOSED EXTENSION TO WORKSHO

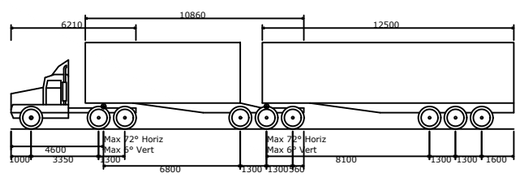
LANE. REFER CIVIL DRAWINGS

ACCESS ROAD CONNECTION CROSSO

13000

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



B-Double (25.0m)

Overall Length	25000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	HT	PC	PD	29/03/23

ttpp transport planning

PROJECT
1154 GUNNEDAH ROAD, WESTDALE
OAKBURN PROCESSING FACILITY

TITLE
SWEPT PATH ANALYSIS
25m B-DOUBLE VEHICLE

DWG No. 22514CAD003
FIGURE _3

DATE STAMP 29 MARCH 2023

PROJECT No.	SCALE	REV.
22514	1:700 @A3	A

Filename: 22514CAD003-230328-SWEPT PATH.dwg Date: 29 March 2023

UNDARY 171° 28' 00"
134.39 m

LINE OF OVERHEAD
ELEC LINES

2
0116

292690

902

EASEMENT BOUNDARY

24

EASEMENT BOUNDARY

898

EASEMENT

ER

NEW ACCESS EASEMENT

ACCESS ROAD CONNECTION
TO ESTATE ROAD.

REFER DRG 0110 -OVERALL SITE PLAN FOR CONTINUATION OF DRAWING

LOT 101
DP 1097471

NEW WIRE CATTLE FENCE TO
FULL EASEMENT PERIMETER

EASEMENT BOUNDARY

5000

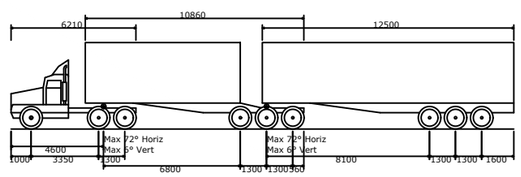
ING FENCE LINE

EXISTING FENCE LINE

EASEMENT

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



B-Double (25.0m)

Overall Length	25000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15000mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	HT	PC	PD	29/03/23

ttpp transport planning

PROJECT
1154 GUNNEDAH ROAD, WESTDALE
OAKBURN PROCESSING FACILITY

TITLE
SWEPT PATH ANALYSIS
25m B-DOUBLE VEHICLE

DWG No. 22514CAD003
FIGURE _4

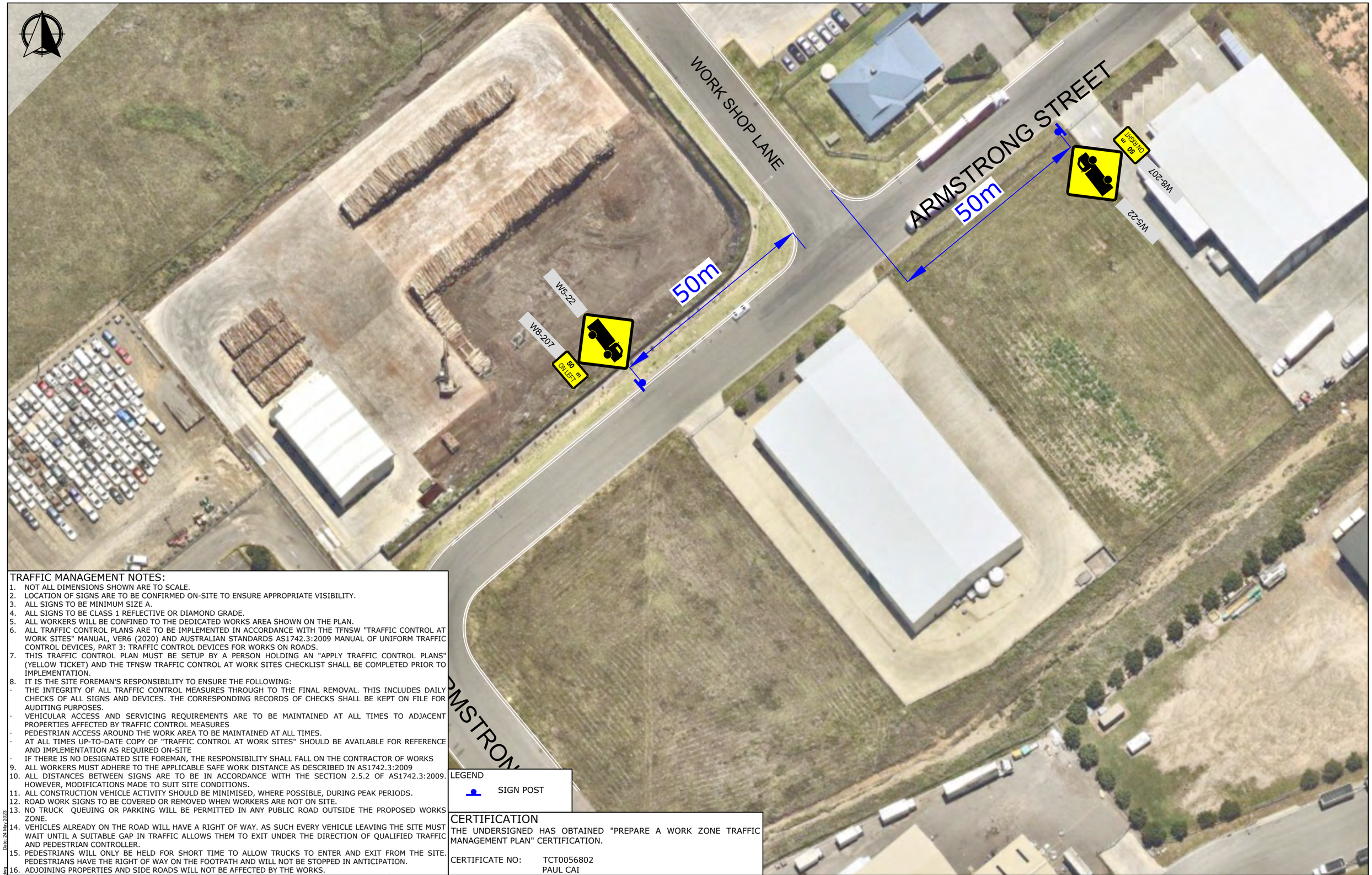
DATE STAMP 29 MARCH 2023

PROJECT No. 22514 | SCALE 1:1000 @A3 | REV. A

Filename: 22514CAD003-230329-SWEPT PATH.dwg Date: 29 March 2023

Appendix C

Traffic Guidance Scheme



TRAFFIC MANAGEMENT NOTES:

1. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
2. LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
3. ALL SIGNS TO BE MINIMUM SIZE A.
4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
5. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
6. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE TFNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER6 (2020) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
7. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "APPLY TRAFFIC CONTROL PLANS" (YELLOW TICKET) AND THE TFNSW TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
8. IT IS THE SITE FOREMAN'S RESPONSIBILITY TO ENSURE THE FOLLOWING:
   - THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
   - VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES
   - PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
   - AT ALL TIMES UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE
   - IF THERE IS NO DESIGNATED SITE FOREMAN, THE RESPONSIBILITY SHALL FALL ON THE CONTRACTOR OF WORKS
9. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009
10. ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH THE SECTION 2.5.2 OF AS1742.3:2009. HOWEVER, MODIFICATIONS MADE TO SUIT SITE CONDITIONS.
11. ALL CONSTRUCTION VEHICLE ACTIVITY SHOULD BE MINIMISED, WHERE POSSIBLE, DURING PEAK PERIODS.
12. ROAD WORK SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
13. NO TRUCK QUEUING OR PARKING WILL BE PERMITTED IN ANY PUBLIC ROAD OUTSIDE THE PROPOSED WORKS ZONE.
14. VEHICLES ALREADY ON THE ROAD WILL HAVE A RIGHT OF WAY. AS SUCH EVERY VEHICLE LEAVING THE SITE MUST WAIT UNTIL A SUITABLE GAP IN TRAFFIC ALLOWS THEM TO EXIT UNDER THE DIRECTION OF QUALIFIED TRAFFIC AND PEDESTRIAN CONTROLLER.
15. PEDESTRIANS WILL ONLY BE HELD FOR SHORT TIME TO ALLOW TRUCKS TO ENTER AND EXIT FROM THE SITE. PEDESTRIANS HAVE THE RIGHT OF WAY ON THE FOOTPATH AND WILL NOT BE STOPPED IN ANTICIPATION.
16. ADJOINING PROPERTIES AND SIDE ROADS WILL NOT BE AFFECTED BY THE WORKS.

LEGEND

SIGN POST

CERTIFICATION

THE UNDERSIGNED HAS OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN" CERTIFICATION.

CERTIFICATE NO: TCT0056802
PAUL CAI

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	HT	PC	PD	23/05/23

ttpp transport planning

PROJECT

1154 GUNNEDAH ROAD, WESTDALE
OAKBURN PROCESSING FACILITY

TITLE

TRAFFIC GUIDANCE SCHEME
WORKSHOP LANE AND ARMSTRONG STREET INTERSECTION

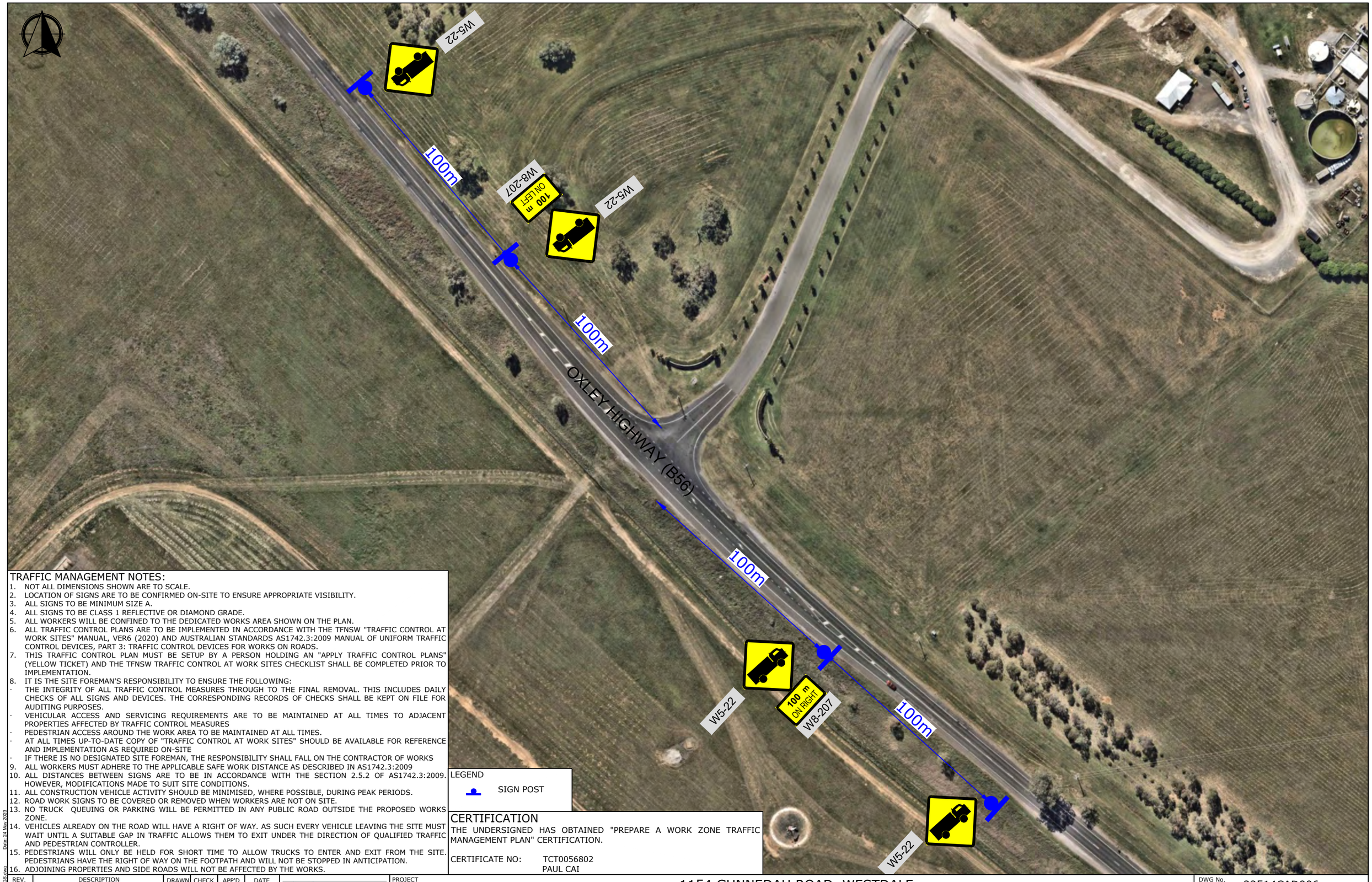
DWG No. 22514CAD006
FIGURE 1

DATE STAMP 23 MAY 2023

PROJECT No. 22514 | SCALE 1:800 @A3 | REV. A

Date: 24 May 2023

Filename: 22514CAD006-230523-TGS.dwg



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3. ALL SIGNS TO BE MINIMUM SIZE A.
4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
5. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
6. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE TFNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER6 (2020) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
7. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "APPLY TRAFFIC CONTROL PLANS" (YELLOW TICKET) AND THE TFNSW TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
8. IT IS THE SITE FOREMAN'S RESPONSIBILITY TO ENSURE THE FOLLOWING:
   - THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
   - VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES
   - PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
   - AT ALL TIMES UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE
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11. ALL CONSTRUCTION VEHICLE ACTIVITY SHOULD BE MINIMISED, WHERE POSSIBLE, DURING PEAK PERIODS.
12. ROAD WORK SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
13. NO TRUCK QUEUING OR PARKING WILL BE PERMITTED IN ANY PUBLIC ROAD OUTSIDE THE PROPOSED WORKS ZONE.
14. VEHICLES ALREADY ON THE ROAD WILL HAVE A RIGHT OF WAY. AS SUCH EVERY VEHICLE LEAVING THE SITE MUST WAIT UNTIL A SUITABLE GAP IN TRAFFIC ALLOWS THEM TO EXIT UNDER THE DIRECTION OF QUALIFIED TRAFFIC AND PEDESTRIAN CONTROLLER.
15. PEDESTRIANS WILL ONLY BE HELD FOR SHORT TIME TO ALLOW TRUCKS TO ENTER AND EXIT FROM THE SITE. PEDESTRIANS HAVE THE RIGHT OF WAY ON THE FOOTPATH AND WILL NOT BE STOPPED IN ANTICIPATION.
16. ADJOINING PROPERTIES AND SIDE ROADS WILL NOT BE AFFECTED BY THE WORKS.

LEGEND

SIGN POST

CERTIFICATION

THE UNDERSIGNED HAS OBTAINED "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN" CERTIFICATION.

CERTIFICATE NO: TCT0056802
PAUL CAI

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	HT	PC	PD	23/05/23

ttpp transport planning

PROJECT
1154 GUNNEDAH ROAD, WESTDALE
OAKBURN PROCESSING FACILITY

TITLE
TRAFFIC GUIDANCE SCHEME
OXLEY HIGHWAY INTERSECTION

DWG No. 22514CAD006
FIGURE 2

DATE STAMP 23 MAY 2023

PROJECT No. 22514 | SCALE 1:1500 @A3 | REV. A

Date: 24 May 2023
Filename: 22514CAD006-230523-TGS.dwg

Appendix D

Driver Code of Conduct

Driver Code of Conduct

This document sets out the requirements for all employees and contractors working at the site.

DECLARATION

I, the undersigned, hereby agree to abide by the Driver Code of Conduct for the transportation of construction materials to/ from the site in a safe manner.

I have read and understand the requirements outlined in the Code and will, to the best of my ability, comply and assist with their implementation, requirements and ongoing administration.

Driver

Full Name: _____

Organisation: _____

Signature: _____

Date: _____

General Requirements

The Driver Code of Conduct would be distributed to all sub-contractors with fleet accessing the site prior to the commencement of works. The Code would be provided to each driver to read and sign to confirm they have understood and pledge to follow the haulage instructions. Once completed, a copy of the signed Code would be supplied to the contractor for record keeping.

All drivers travelling to and from the subject site must:

- Have read and signed the Driver Code of Conduct (this document) prior to entry to the site;
- Hold a valid driver's license for the class of vehicle that it being operated;
- Operate the vehicle in a safe manner while on site and public road network;
- Comply with the direction of authorised site personnel when onsite;
- All drivers are to use seat belts when driving; and
- All drivers are to drive to the sign posted speed limit, both on public roads and within the site.

Site Access

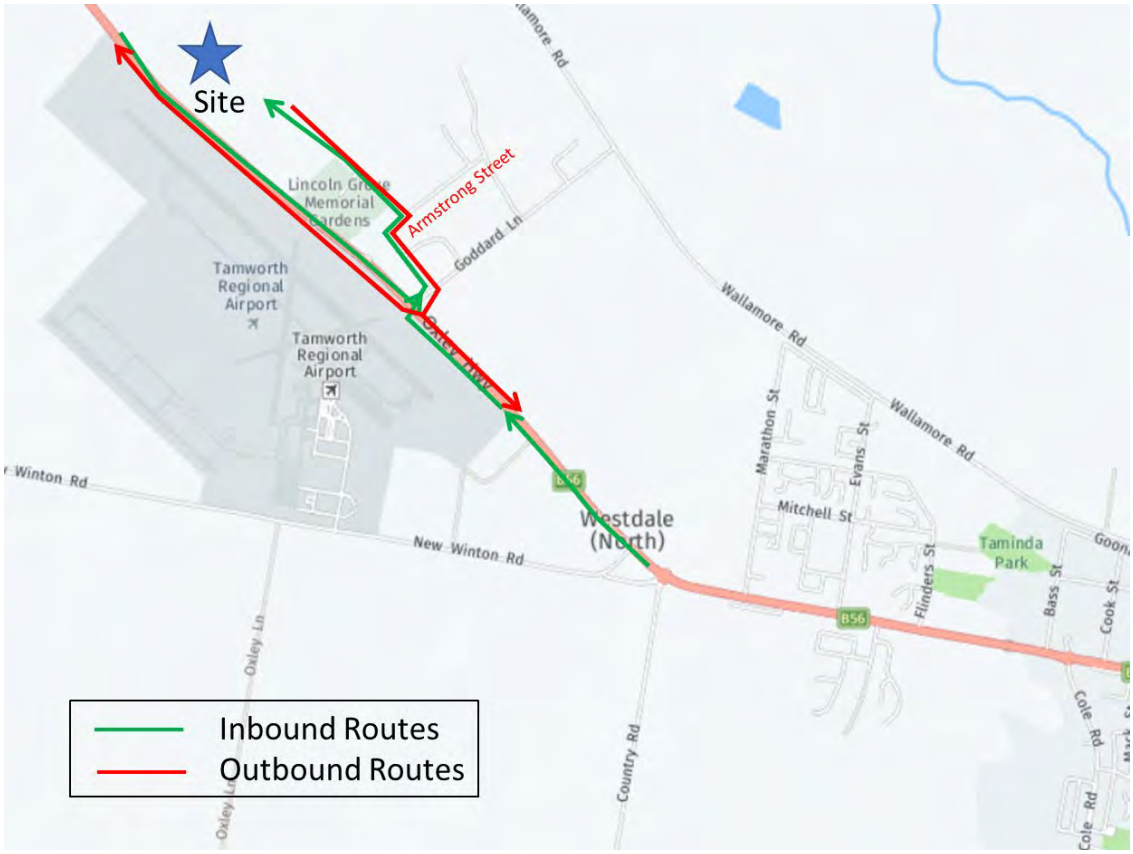
All access to the construction site is to be via the new site access road off Workshop Lane only.

Heavy Vehicle Haul Routes

All heavy vehicle drivers must adhere to the designated truck routes to/from the site which are via Oxley Highway (B65), Goddard Lane, Armstrong Street and Workshop Lane.

All vehicles must enter and exit the site in a forward direction.

The truck routes are shown in the figure below.



Vehicle Speed

Truck drivers must comply with the Australian Road Rules with travelling along public roads. Drivers are to observe the posted speed limits, and adjust speed appropriately to suit the road and weather conditions at the time.

The maximum speed that a vehicle must travel is the signposted speed. Warning signs indicating a reduction in speed ahead must also be obeyed.

The signposted speed limit on Goddard Lane is 80 km/hr, and 50 km/hr on Armstrong Street and Workshop Lane.

The speed limit within the site is 5km/hr (unless signposted otherwise in an area) which is to be strictly maintained.

Heavy Vehicles Driver Fatigue

The heavy vehicle driver fatigues law commenced in NSW in 2008 and applies to trucks and truck combinations over 12 tonnes GVM (however, Ministerial Exemption Notices may apply).

Under the law, industry has the choice of operating under three fatigue management schemes, namely:

1. Standard Hours of Operation
2. Basic Fatigue Management (BFM)

3. Advanced Fatigue management (AFM).

All heavy vehicle drivers associated with the construction works at the subject site must be aware of their adopted fatigue management scheme and operate within its requirements.

Noise Control

Where possible, heavy vehicle operators should not use engine brakes near residences and built up areas.

All heavy vehicles must be fitted with audible reversing alarms. However, to minimise disturbance to neighbouring residents, reversing should be minimised on-site where possible.

Permitted times of construction works at the site are as follows:

- Construction works shall be carried out on Monday to Friday 7:00am – 6:00pm and Saturday 8:00am – 1:00pm.

Load Covering

All loaded trucks arriving at and departing from the construction site are required to have an effective cover over their load for the duration of the journey. The load cover may be removed only upon arrival at the destination (ie. at the site).

Care must be taken to ensure that all loose debris from vehicles and wheels is removed prior to exiting the site.

Site management is to monitor loose material on the side of the haul route and take appropriate action regularly.

Other Safety Considerations Along the Haul Route

Heavy vehicle drivers should be aware of the following:

- Concealed driveways – drivers are to drive with caution around any signed concealed driveways
- Wet weather safety – drivers should adjust their driving speed to suit weather condition at the time.
- Other motorists – drivers should stay alert to other drivers, motorcyclists and cyclists on whilst driving to/ from the site.
- Safe driving practices – apply minimum distance between vehicles, minimise distractions within the vehicle, ensure checks for vehicles and equipment quality prior to journey, observe dispatch and product transportation schedule.

Appendix E

Oxley Highway Site Access Movement Summaries

MOVEMENT SUMMARY

Site: 101 [Existing AM (Site Folder: Oxley-Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Existing AM 6.30am-7.30am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Oxley Highway (SE)															
22	T1	All MCs	121	18.2	121	18.2	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
23	R2	All MCs	7	0.0	7	0.0	0.004	5.7	LOS A	0.0	0.1	0.17	0.55	0.17	52.2
Approach			128	17.2	128	17.2	0.069	0.3	NA	0.0	0.1	0.01	0.03	0.01	59.5
NorthEast: Existing Site Access															
24	L2	All MCs	3	0.0	3	0.0	0.003	5.7	LOS A	0.0	0.1	0.19	0.53	0.19	52.3
26	R2	All MCs	1	0.0	1	0.0	0.003	6.6	LOS A	0.0	0.1	0.19	0.53	0.19	52.2
Approach			4	0.0	4	0.0	0.003	5.9	LOS A	0.0	0.1	0.19	0.53	0.19	52.3
NorthWest: Oxley Highway (NW)															
27	L2	All MCs	1	0.0	1	0.0	0.041	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.4
28	T1	All MCs	75	9.3	75	9.3	0.041	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach			76	9.2	76	9.2	0.041	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
All Vehicles			208	13.9	208	13.9	0.069	0.3	NA	0.0	0.1	0.01	0.03	0.01	59.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Existing PM (Site Folder: Oxley-Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Existing PM 5.30pm-6.30pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Oxley Highway (SE)															
22	T1	All MCs	100	9.0	100	9.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
23	R2	All MCs	2	100.0	2	100.0	0.002	7.5	LOS A	0.0	0.1	0.29	0.54	0.29	47.0
Approach			102	10.8	102	10.8	0.054	0.2	NA	0.0	0.1	0.01	0.01	0.01	59.7
NorthEast: Existing Site Access															
24	L2	All MCs	1	0.0	1	0.0	0.002	5.9	LOS A	0.0	0.0	0.28	0.53	0.28	52.1
26	R2	All MCs	1	0.0	1	0.0	0.002	6.7	LOS A	0.0	0.0	0.28	0.53	0.28	51.9
Approach			2	0.0	2	0.0	0.002	6.3	LOS A	0.0	0.0	0.28	0.53	0.28	52.0
NorthWest: Oxley Highway (NW)															
27	L2	All MCs	1	0.0	1	0.0	0.069	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	57.4
28	T1	All MCs	121	15.7	121	15.7	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			122	15.6	122	15.6	0.069	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			226	13.3	226	13.3	0.069	0.2	NA	0.0	0.1	0.01	0.01	0.01	59.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Existing AM & Construction (Site Folder: Oxley-Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Existing with construction traffic: 6.30am-7.30am
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Oxley Highway (SE)															
22	T1	All MCs	121	18.2	121	18.2	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
23	R2	All MCs	49	4.1	49	4.1	0.030	5.8	LOS A	0.1	1.0	0.19	0.56	0.19	52.0
Approach			170	14.1	170	14.1	0.069	1.7	NA	0.1	1.0	0.05	0.16	0.05	57.4
NorthEast: Existing Site Access															
24	L2	All MCs	4	25.0	4	25.0	0.004	6.1	LOS A	0.0	0.1	0.20	0.53	0.20	51.3
26	R2	All MCs	1	0.0	1	0.0	0.004	6.8	LOS A	0.0	0.1	0.20	0.53	0.20	52.1
Approach			5	20.0	5	20.0	0.004	6.2	LOS A	0.0	0.1	0.20	0.53	0.20	51.5
NorthWest: Oxley Highway (NW)															
27	L2	All MCs	10	0.0	10	0.0	0.046	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	56.8
28	T1	All MCs	75	9.3	75	9.3	0.046	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach			85	8.2	85	8.2	0.046	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.0
All Vehicles			260	12.3	260	12.3	0.069	1.4	NA	0.1	1.0	0.04	0.14	0.04	57.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Existing PM & Construction (Site Folder: Oxley-Site Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Existing with Construction Traffic: 5.30pm-6.30pm
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Oxley Highway (SE)															
22	T1	All MCs	100	9.0	100	9.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
23	R2	All MCs	2	100.0	2	100.0	0.002	7.5	LOS A	0.0	0.1	0.29	0.54	0.29	47.0
Approach			102	10.8	102	10.8	0.054	0.2	NA	0.0	0.1	0.01	0.01	0.01	59.7
NorthEast: Existing Site Access															
24	L2	All MCs	42	4.8	42	4.8	0.040	6.0	LOS A	0.2	1.2	0.25	0.55	0.25	52.0
26	R2	All MCs	10	0.0	10	0.0	0.040	6.8	LOS A	0.2	1.2	0.25	0.55	0.25	52.0
Approach			52	3.8	52	3.8	0.040	6.2	LOS A	0.2	1.2	0.25	0.55	0.25	52.0
NorthWest: Oxley Highway (NW)															
27	L2	All MCs	1	0.0	1	0.0	0.069	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	57.4
28	T1	All MCs	121	15.7	121	15.7	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			122	15.6	122	15.6	0.069	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			276	11.6	276	11.6	0.069	1.2	NA	0.2	1.2	0.05	0.11	0.05	58.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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14 APPENDIX E – PROJECT COMPLAINTS REGISTER AND REPORT FORM

COMPLAINTS REGISTER

RICHARD CROOKES CONSTRUCTIONS

PROJECT: BAIADA OAKBURN POULTRY PROCESSING FACILITY

DATED: 21/06/2023

NO.	DATE	TIME	NAME OF COMPLAINANT	ADDRESS	DESCRIPTION OF COMPLAINT	CLIENT ADVISED	RECORDED BY	RESPONSE / ACTION PROVIDED	DATE CLOSED	COMMENTS

EXAMPLE

Inspection Details - 18.3.1 Environmental Incident

Inspection Status	Location	Description
In Progress		BAIADA OPP

Subcontractor Details

Subcontractor
Richard Crookes Constructions Pty Limited

Attendees

Name	Company	Position	Signature
Paul Sniekers	Richard Crookes Constructions	Senior Contracts Administrator	

Checklists

Environmental Incident

Date of Incident	
Location of Incident	
What work activity was being undertaken at time of the incident	
What actions have been taken to control/contain the incident?	
Incident Class	◯ Class 1 ◯ Class 2 ◯ Class 3

Class defined: Class 1: Dangerous occurrence, or actual harm to an ecosystem, property loss or clean up exceeds $10,000, any fines /notices received by external authorities .Class 1 incidents and some cases Class 2 (as determined by senior management) will be investigated, as directed by the BS Environmental Manager or where required reported to the EPA and to initiate the RCC Business Continuity Plan Form 03 0 Investigation Report will be completed by the BS Environmental Site Manager or Senior Safety Advisors and forwarded to the Project Manager for review by the BS Environmental Manager and then reported to Senior management and Executives/Board. Class 2: Major Leak, spill or escape off site of liquids, near miss/dangerous occurrence i.e. plant/equip damage, disruption to services. Note: Some Class 2 will be investigated at the discretion of the BSM Class 3: Minor Leak, spill or escape off site of liquids all less than >10lts, Dust, Vibration The Site Manager/Supervisor will ensure that all Class 2 and Class 3 incidents in or around the site, involving RCC personnel, subcontractors, visitors or passers-by, external authorities, Unions etc. are reported regardless of how minor they appear at the time of the occurrence

Other Observations

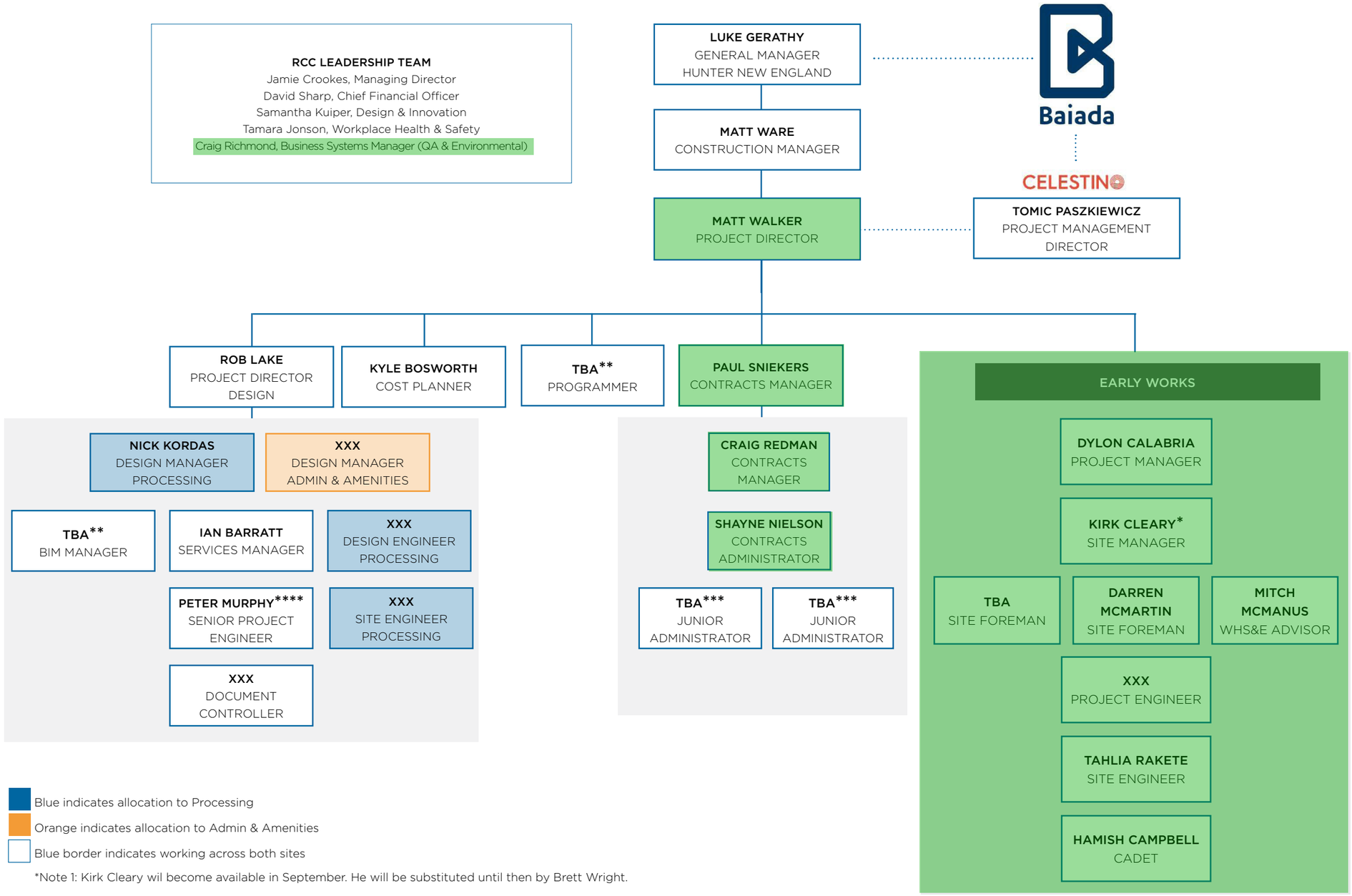
Ref	Classification	Responsible	Priority	Due Date	Date Closed

Outcomes

Metric	Count	%
Negative Observations	0	0%
Positive Observations	0	0%
Open Observations	0	0%
Closed Observations	0	0%
Yes	0	0%
No	0	0%
N/A	0	0%

15 APPENDIX F – PROJECT ORGANISATIONAL CHART

PROPOSED TEAM STRUCTURE: PRECONSTRUCTION & DESIGN



Blue indicates allocation to Processing

Orange indicates allocation to Admin & Amenities

Blue border indicates working across both sites

*Note 1: Kirk Cleary wil become available in September. He will be substituted until then by Brett Wright.

**Note 2: This may be an external resource

***Note 3: These additional Administration resources will be added as required, as the Early Works commence and subcontracts are being administered

****Note 4: Peter will provide input as required to the Griffith DA process until the Admin/Amenities Design Manager is in place.