CONSTRUCTION, ENVIRONMENTAL MANAGEMENT PLAN

Project Name: Stage 2, Courtney Dr, Upper Coomera
Contract Number: 41901-01
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CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

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1.0 INTRODUCTION

This Construction Environmental Management Plan (CEMP) details the environmental management requirements to be followed for the Stage 2, Courtney Dr, Upper Coomera Project. This CEMP includes:

a) A statement of scope and objectives.

b) A schedule of environmental elements that are expected to be affected by the works under the Contract including an outline of proposed mitigation treatments and proposed timeframes.

c) The identification of work activities and an assessment of their potential impacts and associated risks to onsite and offsite environmental receptors (e.g. community, land uses, waters, flora and fauna, cultural heritage, etc. including times when we are not on site.

d) Processes and responsibilities for the implementation, onsite review and maintenance of EMP and associated controls.

e) An adaptive approach for the review and up-date of the EMP as works progress and / or following non-conformances, complains, or previously unidentified issues.

f) After hours response including arrangements for containing environmental damage and attendance on site in the event of an emergency.

g) Legal and other requirements – details of approvals, licenses and permits necessary to meet statutory requirements and associated conditions.

h) Competence, training and awareness – an induction and training plan to ensure that all site personnel (including sub-contractors) understand the EMP and are aware of how the EMP is to be implemented in relation to the works, including any possible emergency response procedures.

i) Operational control – the EMP documents the environmental procedures to manage all identified impacts and environmental protection requirements.

j) Scaled drawings that clearly show the location and extent of environmental controls, modifications to existing control devices and monitoring locations.

2.0 OBJECTIVES

This CEMP has been prepared in order to provide an accurate, detailed assessment of the environmental impacts of the project and to select appropriate environmental control measures such that the desired environmental outcomes are achieved.

The objectives of this CEMP are:

- Provide a project-specific guide to control of environmental risks associated with the project.
- To prevent the occurrence of environmental incidents.
- To ensure that all stages of the construction have been assessed for their environmental impact and adequate control measures devised.
- To ensure full compliance with Legal and Other Requirements for Environmental Management.
- To demonstrate compliance with the Contract Specification and meet client expectations.
- To demonstrate our commitment to our Environmental Policy to protect and improve the state of the environment in which we operate.
- Ensure systems are developed and implemented in accordance with AS/NZS/ISO 14001:2016

3.0 SCOPE OF WORK

Project Name:	Courtney Dr, Upper Coomera Stage 4-5 Bulk Earthworks & Stage 2 Civils
Scope of Works	Works under the contract for subdivision involve, clearing, earthworks and associated civil infrastructure works (retaining walls, sewer, stormwater, water, electrical & comms retic, roadworks and concreting works)
Location of Works:	97 Courtney Dr, Upper Coomera QLD 4209

PROJECT DELIVERY

Contract No: 41901-01 Job No: 18545	Contract Duration: 32 Weeks
Start Date: 01/04/2024	Completion Date: 28/10/2024
Defects Liability Period: 12 Months	Final Completion Date: 14/10/2025

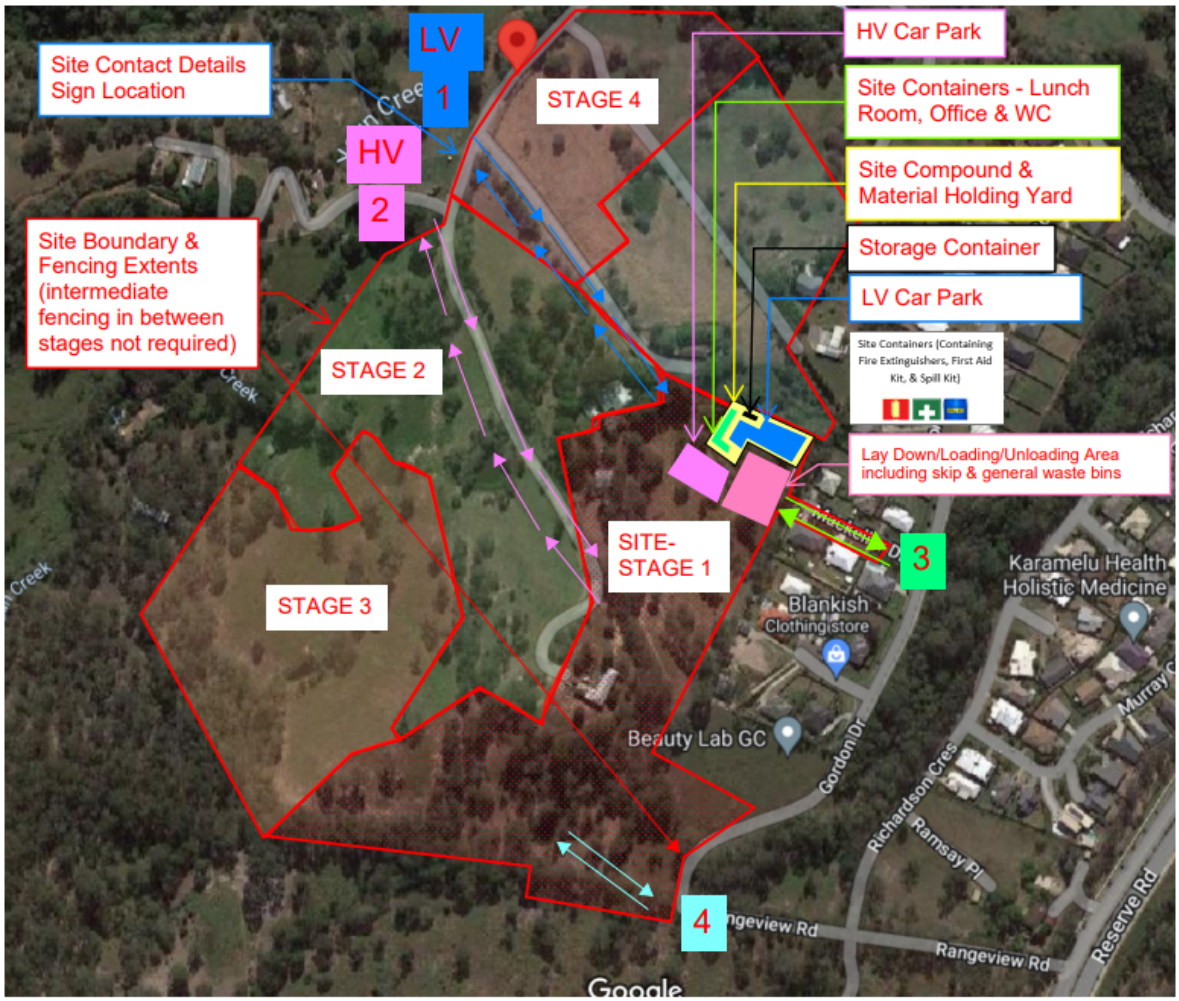
PROJECT DETAILS:

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4.0 SITE-SPECIFIC CONDITIONS

The unique Environmental Aspects of the project and the impact they will have on the construction planning and methodology will be detailed where required under the contract.

4.1 Site Plan



Site plan of proposed facilities & layout within the stage.

5.0 ROLES & RESPONSIBILITIES

Roles and responsibilities specifically pertaining to Environmental Management for this project are as follows:

Project Manager

The Project Manager has overall responsibility for site environmental management. The Project Manager is authorised to liaise with authorities, the client and other external bodies as required.

Project Engineer

The Project Engineer is responsible for Monitoring and Reporting of Environmental performance and review of the CEMP. The process will be as follows:
The CEMP shall be reviewed to incorporate any changes to.

- Scope of works
- Construction Methodology
- The Environmental Aspects and Impacts Register
- Change in environmental conditions
- Non-conformance issued

Foreman

The Foreman must assist Project Manager / Engineer in site environmental management, implementation of the CEMP and ensure its compliance through diligent maintenance of on-site controls.

HSE Co-ordinator

Monitoring the CEMP as per the audit plan and provision of legal updates as and when necessary, assisting the project team as required ensuring compliance with the Contract, and Legal and Other Requirements

6.0 ENVIRONMENTAL TRAINING

Environmental Management training is managed in accordance with procedure WINBMS-EP-03 Environmental Incident Reporting (refer Appendix A).

Winslow personnel directly involved in the implementation of this CEMP and installation and maintenance of environmental control measures will have demonstrated competence and suitable experience in environmental management in a construction environment or have completed a nationally accredited training course which addresses management practices for erosion and sediment control.

Site-specific Environmental Training for field and project staff is provided during the Site Induction (see Appendix D for Site Induction Form). During the site induction, the inductees are introduced to the environmental control measures in place on site by reference to our environmental management procedures and the Environmental Control Plan (see Appendix G).

7.0 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

Each revision of the CEMP will address the administrative requirements and each environmental element in:

- An Environmental Aspects & Impacts Register performed for each stage of construction (refer to CEMP Section 8 and Appendix B)
- An Environmental Control Plan (ECP) – a scaled drawing showing the environmental controls to be adopted at different stages of construction. See Appendix G
- Environmental Control Procedures which satisfy the requirements of the specification, to ensure compliance at each stage of construction.

The environmental aspects addressed in the CEMP may include:

- Soil Management
- Contaminated Soils and Materials
- Storage & Handling of Hazardous Substances
- Water Quality
- Groundwater Quality
- Non-Potable Water
- Erosion and Sediment Control
- Noise and Vibration
- Air Quality
- Flora and Fauna
- Waste and Resource Use
- Fuels and Chemicals
- Weeds, Pests and Diseases
- Cultural Heritage

8.0 ENVIRONMENTAL RISK ASSESSMENT

Environmental Hazards associated with the project have been identified and analysed for level of risk according to BMS Procedure.

The Project has been assessed using the Environmental Aspects & Impacts Register (WINBMS-SP-05-A, see Appendix B) to assign project-specific risk ratings to associated environmental risks.

The Register identifies existing system and operational procedures that have been developed to avoid or minimise risks associated with each identified hazard, and highlights potential for the requirement of special control measures to be devised.

8.1 Stages of Construction

Risk assessment using WINBMS-SP-05 is carried out in a manner that allows for each of the relevant Environmental Aspects associated with different types of activities, which are carried out in varying order, to be appropriately addressed.

At Winslow, we understand that different areas of a project can reach different stages of construction simultaneously, rather than set a regular time frame for review, or deferring review until each stage is imminent, our EMP contains risk assessment of each of the following stages of construction:

- Project Setup.
- Site Preparation.
- Clearing

The Environmental Aspects & Impacts Register (contained in Appendix B) presents the risk assessment in such a way that it can be displayed along-side the Environmental Control Plan for each stage (see Appendix G).

8.2 Location of buildings and structures on adjacent properties.

There are a number of residents that are adjoining directly to the works zone as identified in the markup below, works will be completed in a manner to minimize the effect of construction activities on neighbouring properties. The primary protection measure for adjacent perimeter property damage will be limiting the use of large construction machinery within a 2m buffer of the site. Where machines are required to be utilized within the buffer zone, machines will be downsized as appropriate to complete the task. Clearing of trees along the existing fence lines will be felled by hand by an appropriately qualified arborist. Existing boulder & sleeper retaining walls along boundaries will be taken into consideration for structural design of internal sleeper walls to ensure the structural integrity of the new walls is not compromised.



Neighbouring properties identified as being impacted by works.

Key contact details from the above Section 3.0 will be displayed on a notice board at the light vehicle entrance to site. Any associated community liaisons that will be required (for works impacting neighbouring properties, traffic changes etc) will be communicated via a letter drop notification with the appropriate contact details also included.

8.3 Temporary vehicular access points and frequency of use (Haulage Routes & Plan);

A sketch of the proposed temporary vehicle access point to the Site Compound and Material Laydown Areas is shown below, which is located at the entry to the Development Site at Stage 2, Courtney Drive, Upper Coomera. The frequency of use will be guided by the works onsite.

1. Light Vehicles, (1), are to use 79 Courtney Drive as the designated access and exit points.
2. Heavy vehicles, (2), are to use 97 Cortney Drive as the designated access and exit points.
3. Mackellar Dr, (3), is to be use when construction of the civil component of works commences. This access point will be used for the import materials used in the construction on the project. These materials can range from concrete, roadbase material, gravel, stormwater, water, sewer materials etc. The materials will change depending on the life cycle of the project.
4. Rangeview Rd, (4), is to be use when construction of the civil component of works commences. This access point will be used for the import materials and plant used in the construction on the project. These materials can range from concrete, roadbase material, gravel, stormwater, water, sewer materials etc. The materials and plant will change depending on the life cycle of the project.

*Access for via Rangeview Rd and Mackellar Dr will change depending on the where the project is in its lifecycle and the requirement for specific deliveries to mitigate impacts to the neighbouring community. Due to external works, detours and road closures (not associated with this development) along Baileys Mountain Rd, Old Coach Rd & Reserve Rd the haulage plan to site will need to vary to cater to the changing conditions.

On average there will be 20-30 vehicles using 79 & 97 Courtney Drive as the access points for the duration of the 28 week (scheduled) project. During the road base import operation, its estimated that 6-8 truck & trailer loads per hour will be delivered to the work area through Rangeview and Mackellar Dr. During the concrete items i.e. stormwater structures, sewer structures, footpaths, kerb and so on the requirements for concrete agi truck deliveries may range from 1 delivery per day (minor works) up to 3 loads per hour during kerb and footpaths construction.



8.4 Gantries;

The project **does not** propose to utilize any gantries or overhead protective awnings over the public roads or footpath throughout the period of construction.

8.5 Perimeter Fencing;

The project will utilize existing boundary fencing to delineate the site between adjoining properties, where existing fence is not adequate and at interface locations between the site and public road reserves etc. 1.8m high aluminium temporary fencing will be erected similar to the image below.



This example of temporary fencing is deemed compliant in accordance with the project's safety risk assessment.

HEALTH & SAFETY HAZARDS REGISTER

Project:	**Courtney Drive Upper Coomera**	**Date:**	**24/11/2023**
Prepared By:	**Michael Jabbour**	**Project Revision No:**	**2**
Reviewed By:	**Michael Williams**	**Approved By:**	**Michael Williams**

					Project Risk Assessment				Secondary Assessment, considering all project specific controls		
Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
te Access and Egress Health & Safety Act / Regulations S 3745 Emergency Planning	Slips, Trips and Falls.	Public fatality or injury due to accessing work sites	Project Management Plan		Unlikely	Catastrophic	Medium 10	No public access. Adequate warning signage, Induction prior to site access. Perimeter fencing to be maintained at all times.	Rare	Catastrophic	Low
		Public and worker injuring themselves due to trip hazards	WINBMS-SP-06		Possible	Major	Medium 12	Adequate warning signage, Induction prior to site access, general housekeeping being maintained throughout the duration of the job. Weekly safety inspections, trip hazards identified and rectified immediately.	Possible	Major	Medium
		Public and worker fatality or injury due to being struck by vehicles exiting or entering work sites.	WINBMS-SP-08 TMP		Unlikely	Catastrophic	Medium 10	PPE, Adequate warning signage, Induction prior to site access, Worksite speed limited to be maintained, Adequate warning signs, separation of workers/pedestrians and traffic to be maintained where practicable. Traffic controllers to be used where required as per TGS.	Rare	Catastrophic	Low

8.6 Management of Overhead/ Underground Services

All activities in the vicinity of Overhead / Underground Services will be undertaken in accordance with (WINBMS-OP-04). This Winslow Operating Procedure provides the correct procedures required for works relating to trenching and also works in proximity to power poles, overhead wires and towers.

Adequate service proving must be undertaken (including ground penetrating radar, pot-holing and non-destructive excavation where required), locations of services must be marked using conduits, and current Before –You-Dig-Australia (BYDA) plans must be available on site.

An Asset Protection Plan (APP) showing the location of all known services must be prepared using the information from the BYDA and transposing that information onto a civil face plan. All know services and assets must be then adequately protected for the duration of the job. The APP with “as built” added as needed and an APP Log Sheet (WINBMS-OP-04-G) must be maintained with details of services installed and date of installation together with Operators Daily Services Inspection CL (WINBMS-OP-04- I).

No work will be undertaken without receipt of an approved Permit to Work (Services) (WINBMS-OP-04-C). All personnel associated with excavation works will be signed onto permit.

9.0 ENVIRONMENTAL MANAGEMENT

9.1 Water Quality

Winslow maintain a BMS procedure, WINBMS-EP-17 Water Quality Management (refer Appendix A), which outlines the processes to follow to ensure Winslow’s construction activities do not have a detrimental impact on water quality in waterways.

9.1.1 Water Quality Monitoring

Winslow will conduct water quality monitoring during all stages of construction for the parameters listed in the table below to ensure water quality in the receiving waterways does not vary between the upstream and downstream limits of the worksite during the period (where the upstream results become the background limits), or is as agreed between Winslow, the Superintendent and the EPA.

Parameter	Method
Turbidity - NTU	Measured with on-site meter
Electrical Conductivity – (EC) µS/cm	Measured with on-site meter
pH	Measured with on-site meter
Dissolved Oxygen (DO) – mg/L	Measured with on-site meter
Temperature - °C	Measured with on-site meter
Litter	Visual
Oils and Greases	Visual

Monitoring shall be carried out within waterways and/or drainage infrastructure upstream and downstream of the limits of the site for each rain event within twelve hours of returning to work after a rain event, outside working hours.

Water Quality Monitoring results are recorded on WINBMS-ER-05 Water Quality Register (refer Appendix E).

9.1.2 Dewatering

Water quality monitoring shall take place when dewatering ponded water to receiving waterways.

The quality of ponded water shall not exceed 50 NTU or shall not exceed the turbidity of the water in the receiving waterway.

9.2 Non-Potable Water

Options for use of non-potable water have been investigated and are not feasible for the following reasons:

- A viable source of non-potable water has not been located within reasonable proximity to the works.

9.3 Air Quality

Winslow maintain a BMS Procedure, WINBMS-EP-15 Air Quality Management (refer Appendix A), which describes the manner in which Winslow undertakes its works to ensure air quality is not adversely impacted by construction works.

Winslow will ensure that:

- Dust generated from road construction activities does not create a hazard or nuisance to the public, disperse from the site or across roadways, nor interfere with crops and stock or commercial or residential properties or other dust sensitive receptors.
- Emissions of visible smoke from construction plant and equipment shall be for periods no greater than 10 consecutive seconds.
- Emissions of odorous substances or particulates shall not create or be likely to create objectionable conditions for the public.
- Materials of any type shall not be disposed of through burning.
- Materials that may create a hazard or nuisance dust shall be covered during transport.

9.3.1 Air Quality Monitoring

Air quality will be monitored visually for fugitive dust leaving the site during works. Air quality and plant emissions are monitored visually during weekly environmental inspections and recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.4 Erosion and Sediment Control

Erosion and sediment control measures will be defined and implemented as part of the Environmental Control Plans prepared for each work area.

9.4.1 Erosion and Sediment Control Monitoring

Winslow will inspect all erosion and sediment control works at least weekly, during the weekly environmental inspection, and at the following intervals during rain events:

- Within twelve hours of returning to work after a rain event outside working hours.
- When runoff is leaving site.

Winslow will ensure that any defects or deficiencies in control measures identified by monitoring undertaken is rectified immediately and the control measures are cleaned, repaired and augmented to ensure effective control measure operation.

Monitoring of erosion and sediment controls is recorded during weekly environmental inspections recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.4.2 Stockpile management

Winslow BMS procedure WINBMS-EP-12 Erosion and Sediment Control (refer Appendix A) provides guidance on the management of stockpiles to reduce the risk of environmental impacts of dust, erosion and sediment pollution. Stockpiles will be located no less than 10 metres away from waterways and drainage points. Where it is not possible to provide a clearance of 10 metres, stockpiles will be located above the normal high-water level of waterways and protection provided to prevent stockpiled material entering the waterways.

9.5 Contaminated Soils and Materials

Winslow maintain a BMS procedure WINBMS-EP-05 Contaminated Soils and Materials (refer Appendix A) which establishes guidelines for the handling and disposal of contaminated soils and materials. Discovery of contaminated soils and materials during excavation will be managed in accordance with this procedure, and with TMR and EPA Guidelines.

In the event contaminated soil or material is encountered during excavation Winslow will notify the Superintendent and the EPA if required. Prior to use the contaminated material shall be analysed to verify that the proposed use is in accordance with legislative requirements. The use of contaminated material within the works area shall be subject to the approval of the Superintendent. Where contaminated material is re-used on site or disposed off-site, records will be kept of the source, type of contamination, volume of contaminated material incorporated, the locations placed/legal point of disposal and any investigations/testing undertaken. Details are recorded on WINBMS-EP-14 Waste Minimisation (refer Appendix A).

Winslow BMS procedures WINBMS-EP-01 Fuel and Chemicals and WINBMS-EP-08 Spill Management (refer Appendix A) describe the processes Winslow follow to ensure soils are not contaminated as a result of the works.

9.5.1 Contaminated Soils and Materials monitoring

Winslow will monitor the site for contaminated soils and materials during excavation, and during weekly environmental inspections recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.6 Waste and Resource Use

Winslow BMS procedure WINBMS-EP-14 Waste and Resource Use (refer Appendix A) describes the manner in which Winslow will ensure the generation of waste is managed in accordance with the hierarchy of Avoid, Reuse, Recycle or Dispose of waste material.

All waste material will be managed in accordance with the table below:

Material	Waste Management Option
Asbestos	EPA licensed landfill
Asphalt	Recycle or reuse – not to landfill
Concrete and concrete washings	Recycle or reuse – not to landfill
Contaminated soil	Recycle or reuse on site if opportunity exists, If removed from site, transported by an EPA licensed contractor and disposed in accordance with EPA Regulations
Felled Woody Vegetation (except fragments of noxious or environmental weeds capable of regeneration)	Mulched for reuse, or used for habitat logs
Woody weed fragments capable of regeneration	Burial on site, (deeper than 500mm and not in fill, pavement or other critical areas) composting or landfill
Formwork	Reuse or dispose to landfill
Plastics (Recycle No's 1,2,3,4,5,6,7)	Recycling facility - not to landfill
Metal	Recycle or reuse- not to landfill
Oils and containers and lead acid batteries	Recycling facility – not to landfill
Packaging materials	Recycle where possible or dispose to landfill
Petroleum products from spills (absorbed in spill kit materials or contaminated soil)	Recycle or reuse with rehabilitation of contaminated soils if opportunity exists Transported by an EPA licensed contractor and disposed in accordance with EPA Regulations
Timber (untreated)	Recycle – not to landfill
Litter	Recycle or dispose to landfill
Office Waste	Recycle where possible or dispose to landfill
Other waste excluding the above wastes	Recycle or reuse where the opportunity exists

Skip bins & general waste bins will be located at the vicinity of site laydown area for a localized collection point of rubbish and trade waste to be disposed of legally offsite. Frequency of collection will be determined as required throughout the project lifecycle.

9.6.1 Waste and Resource Monitoring

Winslow will monitor the site for instances of inappropriate waste management during weekly environmental inspections, recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.7 Fuels and Chemicals

Winslow BMS procedures WINBMS-OP-05 Dangerous Goods and Hazardous Substances, WINBMS-EP-01 Fuels and Chemicals, and WINBMS-EP-08 Spill Management (refer Appendix A) provide guidance on how aspects associated with the handling and storage of chemicals is managed on site in order to reduce the risk of chemical spills having an adverse impact on the environment.

Winslow will ensure that:

- Fuel and chemical storage areas comply with the Dangerous Goods (Storage and Handling) Regulations 2012 and EPA Bunding Guidelines.
- Fuel and fluid top-up points are nominated and are located not less than 20 metres from the nearest waterway or drainage point.
- Readily accessible and maintained spill kits are provided for the purpose of cleaning up chemical, fuel and oil spills.
- Personnel are trained in the efficient deployment of spill kits. and
- A contingency plan is prepared that addresses the containment, treatment, and disposal of any spill.

9.7.1 Fuels and Chemicals Monitoring

Winslow will monitor the storage and handling of fuels and chemicals weekly during weekly environmental inspections recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.8 Noise

Winslow procedure WINBMS-EP-16 Ground and Noise Vibration (refer Appendix A) describes how Winslow manages noise and vibration generated by its construction activities, and methods to reduce the impacts.

Winslow will undertake the works under the contract in accordance with the following requirements in accordance with the contract:

- Hours of work shall be between 6:30am and 6pm Monday to Saturday.
- Advise local residents in advance when unavoidable out-of-hours work will occur.
- Obtain Superintendents and Council approval before undertaking works outside the hours above.

9.8.1 Noise Monitoring

Winslow will monitor the site and its plant and equipment for generation of excessive noise during weekly environmental inspections recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.9 Flora and Fauna

Winslow BMS procedure WINBMS-EP-13 Protection of Flora and Fauna (refer Appendix A) provides guidance on how Winslow identifies and protects sensitive/protected Flora and Fauna during the undertaking of its construction activities.

Winslow will:

- Avoid, minimise and offset (where appropriate) the removal of native vegetation during construction.
- Avoid injury to fauna or damage to protected vegetation or habitat.
- Protect significant flora and fauna sites, species or habitat not previously identified.
- Obtain any necessary permits or approvals from the relevant authorities prior to disturbance of flora/fauna sites or relocation of native fauna affected by works under the contract.
- Areas of existing vegetation and native fauna habitat identified to be retained shall be identified as No-Go Zones and protected by temporary fencing and signage.
- Avoid placing or storing materials or debris within the limit of the root zone of vegetation to be retained.
- Avoid trafficking and compacting, storing materials on soil in areas that are currently vegetated or are to be re-vegetated.

Prior to removing any vegetation or habitat, Winslow shall arrange an on-site inspection with the Superintendent and other relevant authorities to confirm and clearly identify and mark trees, vegetation or habitat to be removed. Any removal shall be consistent with the Contract drawings and any relevant permits, and sites nominated as No-Go Zones shall be fenced and signed.

9.9.1 Flora and Fauna Monitoring

Winslow will monitor the site Flora and Fauna management and protective measures during weekly environmental inspections recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.10 Cultural Heritage

No Cultural Heritage sites have been identified within the construction footprint of Stage 1 to 5 of the project. In the event that suspected cultural heritage is encountered Winslow BMS procedure. Protection of Archaeological Heritage Sites describes the process Winslow follows to protect archaeological/cultural heritage.

9.10.1 Cultural Heritage Monitoring

Winslow will monitor the site for cultural/archaeological heritage during excavation and during weekly site environmental inspections recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.11 Weed, Pest and Disease Management

Winslow procedure WINBMS-EP-18 Weeds, Pests and Diseases (refer Appendix A) provides guidance on how Winslow manages weeds, pests and diseases on site, and measures taken to eliminate or reduce the risk of the spread of weeds, pests and diseases.

Winslow shall prevent the spread of declared weeds, pests and diseases within the site and off-site through the implementation of controls that shall include as a minimum:

- Treatment of declared weeds prior to the commencement of ground disturbing activities.
- Response to their identification through monitoring of the site.
- Management of weed and soil pathogen potential within imported materials.
- Provision for cleaning of plant and equipment at the following times:
    - Prior to arrival on site.
    - Prior to departure from site. and
    - Prior to movement within the site from infested to non-infested areas.

9.11.1 Weeds, Pests and Diseases Monitoring

Winslow will monitor the site for weeds, pests and diseases during weekly environmental inspections recorded on CCABMS-SP-15-A Weekly HSE Inspection Check Sheet (refer Appendix E).

9.12 Environmental Control Measures

Appendix G contains the Environmental Control Plan/s for the work (as detailed in Section 9 of the CEMP). This plan contains a scaled, diagrammatic representation of different types of protection measured that will be implemented, including but not limited to:

- Water Quality Monitoring
- De Watering locations
- Ground Water Monitoring
- Locations of sediment controls, such as silt fencing, silt logs, hay bales.

Appendix A of the CEMP contains detailed procedures employed by Winslow to implement Environmental Controls effectively.

All measures to be implemented during the works will be in accordance with the council approved project drawings, which outlines the environmental controls to be implemented.

A site specific Certified Professional Erosion & Sediment Control Plan will be devised and implemented by EnviroConsult Pty Ltd.

Ongoing monthly audits will be conducted by the CPESC to monitor compliance and implement any additions/revisions if required. It is Winslow's policy to mitigate sediment and stormwater runoff on ALC Class A & B Land and implement industry best practice standards

Alisha Croft (EnviroConsulting) will be the project's nominated Environmental Consultant

enviro consulting

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E: alisha@envconsult.com.au

10.0 MONITORING AND REPORTING

All environmental monitoring results, non-conformance reports and environmental data relating to environmental performance shall be submitted to the Superintendent monthly or as agreed.

Reporting data/information and frequency is summarised in the table below.

Data/Information	Frequency
Pollution Infringement Notices or Pollution Abatement Notices and/or any notices of prosecution.	Within 24 hours of receipt by Winslow
Statutory documents obtained by Winslow as part of the project (e.g. permits).	Within 1 week of receipt by Winslow
Results of any air quality and water quality monitoring undertaken as part of the project.	At completion of works
Itemised fuel (diesel, unleaded and LPG) use on-site by Winslow and its subcontractors.	At completion of works
Itemised volumes/quantities, including recycled materials, for the following: • Concrete • Steel (reinforced and other) • Road surface material i.e. spray seal, asphalt • Aggregate • Cement treated crushed rock • Fill material • Lime stabilised aggregate • Plastic products • Copper wire	At completion of works
Itemised quantities and types of materials sent off-site including prescribed waste certificates.	At completion of works
Itemised quantities and sources of all water used on-site.	Monthly
Itemised quantities of energy use (electricity and gas) including the proportion of renewable sources.	At completion of works

10.1. Weekly Inspections

In accordance with Winslow procedures, an inspection of the site is carried out weekly.

During the inspection, CCABMS-SP-15-A Weekly HSE Inspection Check Sheet must be filled out for permanent record. This checklist is contained in Appendix E of the CEMP. Any non-conformances, issues or follow-up action required must be reported to the Foreman and Project Manager / Project Engineer for immediate action.

10.2. Environmental Monitoring & Records

All environmental monitoring shall be performed in accordance with the contract, in addition to the weekly inspection, additional specific environmental monitoring, such as Water Quality, Air Quality, and Vibration monitoring may be required. The BMS contains appropriate registers for recording or environmental monitoring. If this monitoring is required, these forms will be found in Appendix E. The Environmental procedures contained within Appendix A each contain monitoring requirements for each aspect of environmental protection / management.

10.3. Incident Response, Reporting and Investigation

In the event of an incident or a near miss, an incident investigation must be carried out and the relevant form submitted to Winslow HSEQ Department for review. WINBMS-EP-03 (see Appendix A) specifies the use of the WINBMS-EP-03-A Environmental Incident Report (see Appendix F).

It is essential that all incidents are reported to Head Office immediately and that written reports are submitted within 48 hours.

The Principal will be notified of any incident within 24 hours. Incidents of an Environmental nature will be reported to the EPA immediately.

The Emergency Contacts List (see Appendix C) contains all the required contact numbers in case of an emergency, including the EPA. A register of all incidents and near misses will be maintained throughout the duration of the project, this can be found in Appendix C.

11.0 RESTORATION OF SITE

All areas disturbed by construction, both on-site and off-site will be restored at the completion of the works.

Erosion and sediment controls must remain in place and be maintained at least until the new vegetation provides sufficient protection from erosion.

Upon completion of the project, areas such as compounds, material storage areas, access roads and haul roads will be restored as close as possible to their original condition.

12.0 COMPLIANCE AND CONTINUAL IMPROVEMENT

12.1 System Audits

The audit program includes management system audits, operational and technical audits (including workplace and housekeeping inspections), and legal compliance evaluations to verify compliance.

Appendix F contains the Surveillance Audit form (WINBMS-SP-17-B) used for internal system audits.

Sub-contractors engaged by the project will participate in such audits and safety inspections and provide feedback to the project management team.

External compliance audits of the Project Management Plans shall be carried out by an independent third-party auditor if required under the contract.

12.2 Non-Conformance

Winslow Procedure WINBMS-SP-16 Non-Conformance provides guidelines for identification and resolution of non-conformances.

In the event of a non-conformance with the Contract, or the CEMP / BMS, a Non-Conformance Report will be raised using (WINBMS-SP-16-A, Appendix F) and submitted to both Winslow HSEQ Department and the Client and to ensure timely close-out is achieved.

APPENDIX A

BMS ENVIRONMENTAL SYSTEM PROCEDURES INCLUDED IN CEMP

MANAGEMENT OF FUELS AND CHEMICALS (WINBMS-EP-01)

1.0 Objective & Scope

To establish guidelines for management of fuels and chemicals on project sites and is applicable to all construction activities that require fuels or chemicals to be stored onsite.

2.0 Procedure

2.1 It is the responsibility of site project team to ensure that chemicals used onsite are stored and handled appropriately to reduce the risks of spills and leaks and potential impacts to human health and the environment.

2.2 Storage Locations

avoid locations:

- next to stormwater inlets, drainage lines, waterways, and sensitive receivers such as vegetation and animal habitat
- without secondary containment systems (e.g. bunding)
- with potential for direct water pollution or land contamination (e.g. in or on structures that are built over water such as boat sheds, jetties, pontoons)
- on bare ground or unsealed surfaces.

Where required a bund should be constructed to hold at least 25% of the drums stored on site and 100% of the tanks volume installed on site.

Mismanagement of chemicals on site has the potential to contaminate surface waterways, leach toxins into the groundwater, result in fitness or mortality of Flora and Fauna and result in OH&S issues. The environmental protection measures outlined in this procedure may be used to mitigate these effects.

The installation and maintenance of storage locations can be as follows.

- Nominated points for refuelling and fluid top up of vehicles and plant which shall be undertaken in a designated area at least 10 metres from any drainage point, from sensitive receivers (e.g., waterways, vegetation or animal habitats).
- with sealed surfaces
- with suitably designed and maintained secondary containment and covered roofing to exclude rainwater contact.
- Such Nominated Fuel and Chemical Storage areas comply with relevant Dangerous Goods (Storage & Handling) Regulations 2012 and EPA Bunding Guidelines (EPA Publication 347) including signing of compounds and bulk storage containers.
- Disposal of contaminated materials resulting from refuelling areas.
- Provision of readily accessible and maintained hydrocarbon spills kits for the purpose of cleaning fuel and other spillages on site.
- Trained personnel on site for deployment of spill kits in the event of an emergency.
- A contingency plan that shall address the containment, treatment and disposal of any spill.
- The facility should be constructed away from any drainage lines or major water bodies, Excavate bund to a depth of 300mm. Use excess spoil from excavation to build the walls of the bund to 600mm.

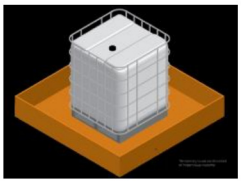
2.3 Establishing Secondary Containment Areas

- **Bunds** – Select suitable location for bunded area.

Raised impermeable barriers forming the perimeter of secondary containment areas (e.g. walls, speed humps, guttering, curbing, flexible rubber barriers constructed with robust, impermeable, UV and chemical resistant material or lined with such material)

- Two layers of thick orange plastic, impervious to chemicals contained in the bund, are required to line the excavation. A layer of sand maybe required before installation of plastic to eliminate the potential for the plastic to be ripped or pierced.
- Provide safe access to ladder and valves by positioning the tank close to the edge and installing a crushed rock platform to comfortably access the container.
- Maintain and monitor the bund area at least once a fortnight for volume and contact the Project Manager if the excavation becomes near full and requires pumping-out.

- **Encasement** – storage containers with built-in (integral) secondary containment (e.g. encasing plastic pipes that carry liquid within a larger pipe which drains to a collection sump, placing drums inside larger, sealed plastic drums during transport by forklift)
- **Grading** of sealed surface areas to form a contained area, either as part of a building or an external structure.



2.4 Handling & Disposal of Chemicals

- Handle and dispose of chemicals appropriately by:
- using the appropriate personal protective equipment (PPE) for worker safety
- keeping current SDS of the chemicals in a location accessible to all staff and emergency services and informing workers of their availability and location
- purchasing smaller quantities and safer chemicals (e.g., granular products instead of dusty powders, water-based products, more dilute chemicals)
- minimising spills and splashes by using safe pouring or decanting techniques e.g., fitting drip collectors to containers with taps, and decanting over a collection tray.
- for mobile bowsers onsite, ensuring that the bowsers have a valve or a tap that either closes off automatically or is lockable to prevent leaks.
- disposing of any unused chemicals in an appropriate manner (contact your local council, local landfill, chemical waste disposal company or EPA QLD for specific advice).

2.5 Spill Response & Clean up

Ensure all spills are contained and do not spread around the site or beyond the site boundary impacting the surrounding environment. Spill response includes containment, clean-up and appropriate disposal.
Ensure employees are trained in the use of spill response equipment.
Spill kits containing absorbent material appropriate to the type of chemical being used on site must be maintained.

3.0 Mobile Refuelling

Where a fuel or a chemical bund for containment is not required to be installed on site, all items of plant or vehicles shall be refuelled on site with the help of mini oil tankers in a designated area on site in accordance with the Environmental Management & Control Plan (EMP)

4.0 Monitoring

Fuel and Chemical storage and Equipment fill areas shall be monitored for compliance at intervals of not more than 7 days.

4.0 REFERENCES

EPA Bulletin Publication 347- Bunding Guidelines, Dec. 1992.
Dangerous Goods (Storage & Handling) regulations 2012
Dangerous Goods (Storage and Handling) Amendment Regulations 2020
EPA Publication 1834 Civil Construction, Building & Demolition Guide. 2020
EPA Publication 1698 Liquid Storage and Handling Guidelines
EPA Publication 1730 Solid Storage & Handling Guidelines.
EPA Act 2017 (Section 25-27 General Environmental Duty)

PROTECTION OF FLORA & FAUNA (WINBMS-EP-13)

1.0 Objective & Scope

Protection of Flora and Fauna as per the contract specifications and is applicable to all Winslow Project sites.

2.0 Procedure

- Avoid, minimize and offset (where appropriate) the removal of native vegetation during construction.
- Avoid injury to fauna or damage to protected vegetation or habitat and
- The discovery of significant flora and fauna sites, species or habitat not previously identified shall be managed to protect flora and fauna.

2.1 Permits and Approvals

Permits from relevant authorities shall be obtained in prior to disturbance if any flora or fauna sites or relocation of native fauna effected by works under the contract.
Works shall comply with all permits and approvals and associated conditions in accordance with the contract.

2.2 Discovery of Significant Flora and Fauna

In the event that significant flora and fauna is discovered, Winslow shall cease work immediately and notify the superintendent.
An appropriately qualified ecologist shall be engaged to accurately identify and provide advice for the management of the discovered significant flora and fauna species.
Winslow shall submit to the superintendent a management plan/procedure that has been approved by the relevant authority to manage the flora and fauna species.

2.3 Protection of Flora and Fauna.

Particular care shall be taken to avoid any damage to the roots, trunks and branches. Protection shall include the erection of fencing outside the limit of the canopy of the vegetation or outside of the fauna site. Fencing shall consist of not less than three strands of wire (located top, middle and bottom) weaved through the Para webbing and appropriately strained, and be located to avoid disturbance and damage to the vegetation or fauna site. The fence shall be erected prior to commencing work on site.

2.4 Removal of Flora and Fauna

Winslow shall engage a qualified ecologist with appropriate permits/licenses to be present on site during the removal of vegetation to;

- Identify and examine any trees (Incl: hollow bearing trees) and fallen logs affected by the works under the contract to identify, capture and relocate fauna identified within the zone to be cleared.
- Provide advice on alternative fauna habitat sites

If appropriate, relocation of any fauna or nests shall be made to adjacent habitat and shall be undertaken in accordance with the requirements of Department of Sustainability and Environment (DSE), where practicable any nests found to be inhabited by native birds or mammals (e.g. possums or gliders) shall be removed outside of species breeding season.
No vegetation removal from within the nominated No-Go Zones attached in this plan shall be undertaken to ensure no impact on any other flora or habitat within the No-Go Zone.
Pruning of any vegetation to be retained shall be undertaken by a suitably qualified practising arborist. (with a minimum qualification of AQF Level 3, Cert III in Horticulture (Arboriculture).
All trees, shrubs and other vegetation outside the limits of stripping are nominated for identification and protection. An Internal PERMIT TO CLEAR **(WINBMS-EP-13-A)** must be completed prior to clearing within or outside the stripping area.

2.5 Damage to Protected Vegetation

Where damage to flora and fauna habitat has occurred as a result of the works under the contract, the superintendent reserves the right to direct Winslow to repair or replace the vegetation or provide fauna habitat to an equivalent or better quality in accordance with the document 'Victoria's Native Vegetation: A Framework for Action' and 'Native Vegetation Revegetation Planning Standards June 2006'.

3.0 Monitoring Requirements

The contractor shall undertake monitoring of the condition of Flora and Fauna habitat sites and protective measures at the sites during construction activities and at other times as per the following intervals.

When construction activities are occurring in the vicinity of the sites**: Daily.**

At other times: **Once in 7 Days**

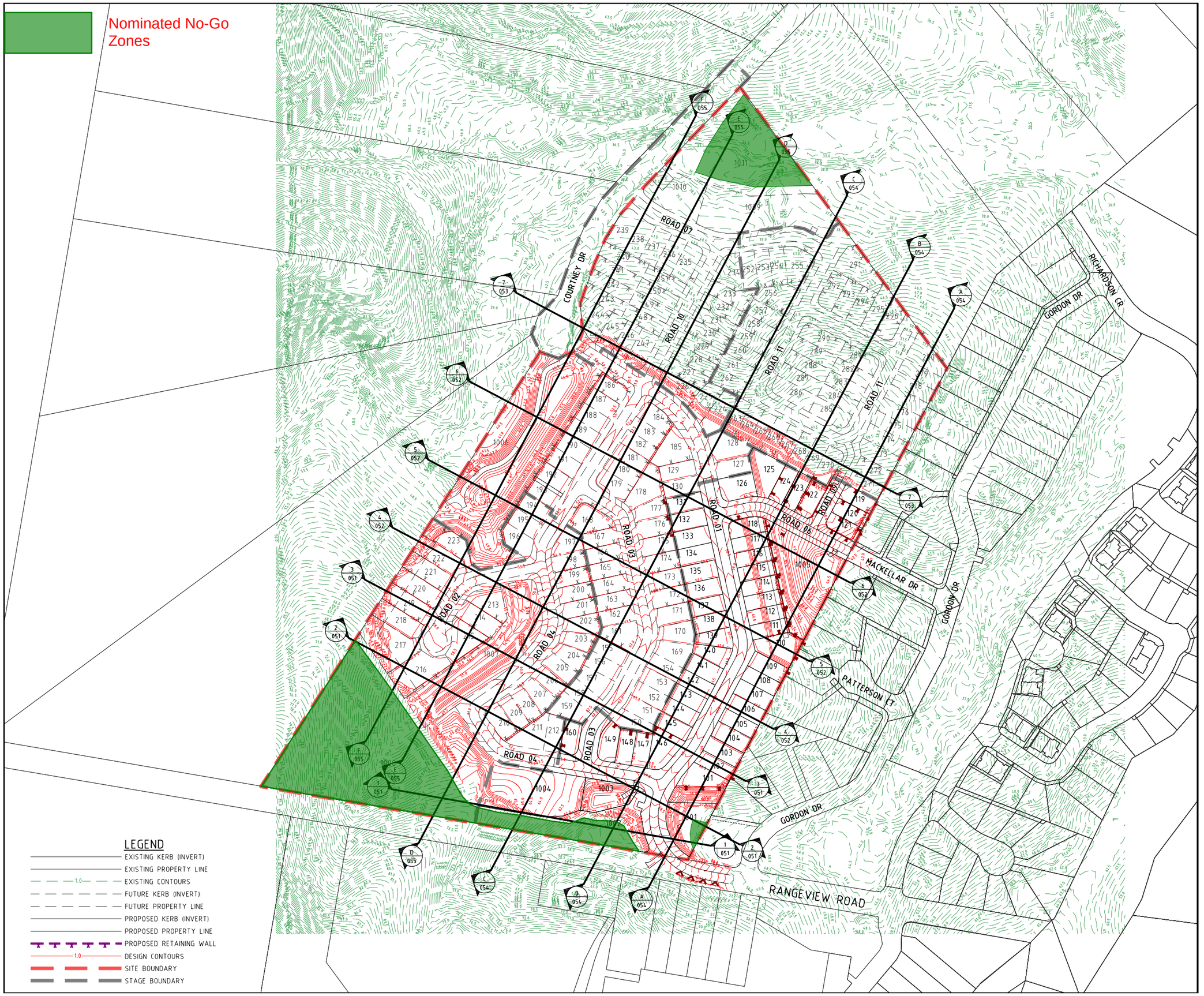
Identify wildlife habitats, remove them sympathetically and relocate displaced animals. All personnel involved in site clearing shall be inducted into these processes. Habitat trees shall be felled with care to minimize impact.

Wherever required, all flora assets shall be protected during the course of the works as far as practical. Confirm the removal of any tree/shrub with the Client Representative prior to its removal. Selection and Relocation of Tree Trunks for Wildlife Habitat

4.0 References:

Flora and Fauna Guarantee Act 1988
Wild Life Act 1975 (Amended 2002)
EPA Act 2017 (Section 25-27 General Environmental Duty)
EPA Amendment Act 2018

Nominated No-Go Zones



LEGEND

- EXISTING KERB (INVERT)
- EXISTING PROPERTY LINE
- 1.0 EXISTING CONTOURS
- FUTURE KERB (INVERT)
- FUTURE PROPERTY LINE
- PROPOSED KERB (INVERT)
- PROPOSED PROPERTY LINE
- PROPOSED RETAINING WALL
- 1.0 DESIGN CONTOURS
- SITE BOUNDARY
- STAGE BOUNDARY

PROJECT NAME

COURTNEY DR UPPER COOMERA

STAGE 01

RP DESCRIPTION

LOT 188, 189, 190, 191 & 192 ON RP173728
COURTNEY DRIVE
LOCALITY OF UPPER COOMERA
LOCAL AUTHORITY - GOLD COAST CITY COUNCIL

CLIENT

HB Land

NORTH

0 15 30 45 60 75m

Scale 1:1500 - A1 (1:3000 - A3)

REV	DATE	DESCRIPTION	INT
B	14-07-23	RFI AMENDMENTS	EP
A	03-03-23	COUNCIL ISSUE	JB

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BIOME WATER AND ENVIRONMENTAL CONSULTING
Robin Russell & ASSOCIATES PTY. LTD.
BENNETT+BENNETT

DRAWING TITLE

BULK EARTHWORKS SECTION KEY PLAN

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DESIGNED	RB	DRAWN	EMH
APPROVED	RPEQ 4706	DATE	03-03-23

DRAWING NUMBER	REV
41901-01-050	A

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AIR QUALITY MANAGEMENT (WINBMS-EP-15)

1.0 Objective & Scope

To consider all factors impacting air quality including climatic conditions, physical characteristics of the site and the nature of activities to be undertaken. This is applicable to all Winslow project sites.

2.0 Procedure

To minimize air pollution generated from construction works that could impact the health and wellbeing of sensitive environments and receptors, control measures may be implemented in accordance with the project aspects register **WINBMS-SP-05-A** and the requirements outlined in the State Environment Protection Policy (Air Quality Management) and EPA Publication 1834/2020.

Where required:

- grass seeding of earth stockpiles or other protective measures to prevent dust.
- the progressive topsoiling and revegetation of the Site as work proceeds.
- watering of Works areas and temporary paving of haul roads to suppress dust.
- cessation of works at areas of the Site where climatic conditions are such that construction operations generate unacceptable levels of dust pollution; and
- Minimise the extent of exposed stripped surface to be covered with appropriate fill material.
- Avoid generating greenhouse gases where practicable including disposal of any material through burning.

Conduct operations on site in such a manner as to ensure that no visible dust escapes the site into adjacent residences, properties and roadways. At any time where visible dust crosses into adjacent properties or roadways, take immediate action to stop the movement of dust from the site, including cessation of plant movement and work.

Results of dust monitoring shall be submitted for testing within 24 hours of collection and sampling.

Undertake ongoing monitoring and measurement of dust from the site during the course of the Works shall not exceed the limits, in accordance with the requirements of Australian Standard **AS3580.10.1 - 2003.**

3.0 Operate and maintain dust monitoring stations if required in accordance with State Environmental Protection Policy and the project aspects register. Ensure that all monitoring stations are secure from vandalism and tampering at all times.

The monitoring stations shall be at locations where dust is likely to have the greatest impact on adjacent properties or create inconvenience to the general public. One monitoring station may be a reference station placed in proximity to the site which is unaffected by work under the contract. Where required under the contract, results of dust monitoring shall be submitted to the client superintendent within 14 days of collection.

The risk identification process for dust is carried out in the weekly environmental check and recorded on the Environmental Checklist (CCABMS-SP-15-A). If an issue arises the NCR procedure shall follow to resolve the issue.

Ensure that all dust levels experienced throughout the Contract period do not exceed levels as per the table below or as required contractually. Should the monthly dust monitoring reports show that this level has been exceed, undertake measures to reduce the dust to the required level.

Table:

Period	Total Solids (Max)
November to March	2 grams/square metre, for any 14 day consecutive period
April to October	4 grams/square metre, for any 30 day consecutive period

Figures for total solids (max) are exclusive of background dust (dust unrelated to the construction works). Emissions of visible smoke to the atmosphere from construction plant and equipment shall be for periods no greater than the periods as shown in Table below.

Table

Construction Plant & Equipment Type	Maximum period for visible smoke
Plant not registered for use on public roads	15 Consecutive seconds
Plant registered for use on public roads	10 Consecutive seconds

Plant Emissions

All construction plant and equipment shall be effectively maintained such that they do not emit to the atmosphere visible smoke for any period greater than fifteen consecutive seconds (in the case of plant not being registered for use on public roads), and ten consecutive seconds (in the case of plant registered for use on public roads).

Odorous Substances and Particulate

The emission of odorous substances or particulate which creates or is likely to create objectionable conditions for the public shall not be permitted.

Noise Pollution

Construction vehicles and equipment shall have appropriate measures fitted and be effectively maintained to minimize engine noise and comply with the appropriate regulations and by-laws relating to noise. In addition, work shall be programmed to avoid noisy operations outside normal construction hours. Where possible, noise attenuation measures shall be programmed early in the construction period to minimize disturbance to adjacent properties.

4.0 References:

EPA Technical Guidelines. Publication 1834/2020, 1254/2008 (except Section 2,) specifically for noise limits applying to times outside normal working hours. All noise emissions generated within the project boundaries shall comply with EPA publication as above.
Winslow legal registers.
EPA Publications 440.1 and 852 Air Quality
EPA Act 2017 (GED Section 25-27 and Section 31-33)
EPA Amendment Act 2018

WATER QUALITY MANAGEMENT (WINBMS-EP-17)

1.0 Objective & Scope

To establish guidelines to minimise the discharge of elements and other pollutants to surface waters and is applicable to all Winslow Project Sites

2.0 Procedure

2.1 All water runoff from the site discharged directly and indirectly into any surrounding waterway and/or drainage network, shall meet the water quality criteria as per Table below **or as required under the contract.** Winslow to sample and test the water quality at the earliest opportunity and submit such test results to the client's Superintendent as required.

Where the measured background levels are above the objectives stipulated vide table below, the background levels shall become the objective for each individual parameter.

2.2 The sampling/monitoring of significant storm events shall include the collection, of samples from each point where water leaves the site. Regularly collect data from at least two control points, upstream and downstream respectively of the stormwater treatment and drainage system.
All water run-offs from the site discharged both directly and indirectly into any surrounding waterway and/or drainage network and for all rain events up to and including the 1 in 2 year ARI, (Average Recurrence Interval) shall meet the parameter criteria requirements of the EPA PUBLICATION 480- Section 4.3 both for the periods during and after construction.
Stockpiles located on site shall provide where possible a clearance of not less than 10 metres from the watercourses. Where it is not possible to provide a 10-meter clearance, the stockpile shall be above the high normal water level of the watercourse and additional protection shall be provided to prevent the stockpile entering the watercourses.

Results of routine water quality monitoring shall be submitted to the Superintendent as required within twenty four hours of test results being available except that any nonconforming test results shall be reported immediately.

3.0 Monitoring Requirements

Monitoring shall be carried out at locations as follows or as required under the contract,

- In waterways upstream and downstream of the limits of the site.
- At appropriate locations within the site including immediately upstream and downstream of each discharge point.
- At all discharge points from the site to surrounding waterways and drainage networks, immediately to the waterway/drainage network.
- Winslow to maintain equipment capable of providing instantaneous monitoring of turbidity, and have such equipment available on site at all times.

The frequency of monitoring shall be in accordance with Table as below or as required under the contract.

WATER QUALITY MANAGEMENT (WINBMS-EP-17)

Table - **WATER QUALITY MONITORING**		
FREQUENCY	LOCATION	WATER QUALITY PARAMETER
Prior to work commencing	All Discharge Points	All
Daily	All Discharge Points	Litter, Oil & Grease
Weekly	All Discharge Points	Flow, PH, Electrical Conductivity, Turbidity & Dissolved Oxygen, Suspended Solids.
Each Rain Event* as follows Within one hour of commencement during working hours	Discharge points to waterways and drainage networks.	Turbidity and Suspended Solids
Every four hours for periods of continuous rain during working hours.		
Within 12 hours of a rain event outside of working hours.		
At 24 hours and 48 hours after a rain event to determine stream recovery.		
* a rain event is defined as a rainfall of 10mm or more over a maximum period of 24 hours and /or run off is evident on site. * Testing of Water Quality parameters subject to site specific contaminants of concern or in accordance with requirements in the contract.		

Details of all monitoring locations shall be maintained on a site plan.

4.0 Dewatering

Water Quality Monitoring shall be undertaken when dewatering ponded water to receiving waterways

The quality of ponded water to be dewatered to receiving waterways shall not exceed 30 NTU or shall be equal to or better than the water quality in the receiving waterways if the turbidity in the receiving waterway is less than 30 NTU.

The pH of the ponded water to be dewatered shall be within the range 0f 6.4-7.7

Monitoring for dewatering activities shall be undertaken at the following frequencies.

a) The ponded water at the pump intake

a) At appropriate locations within the site including immediately upstream and downstream of each discharge point.

b) At the pump outlet where dewatering occurs into drainage infrastructure

5.0 Bypass Pumping

Water Quality monitoring shall be undertaken when bypass pumping of water around works is being undertaken within a waterway

Monitoring shall be carried out

- In waterways upstream and downstream of limits of the site;
- At appropriate locations in waterways within the site including immediately upstream and downstream of each point source (or flow) entering along the length of waterways within the project site.

Details of all monitoring locations shall be maintained on the scaled drawings associated with the EMP. Monitoring sites shall be accessible during all on site activity and in all weather conditions.

6.0 References:

The Winslow Legal Register.
Water Quality Monitoring Register
EPA publication 441- a guide to sampling and analysis of waters,
Waste waters, soils and wastes.
EPA Publication 1834 Civil Construction, Building & Demolition Guide
EPA Act 2017 (Sec 25-27 General Environmental Duty)

FIRE ANT MANAGEMENT (WINBMS-EP-21)

1.0 Purpose and Scope

The objective of this procedure is to identify and appropriately manage Fire Ants on all Winslow construction sites.

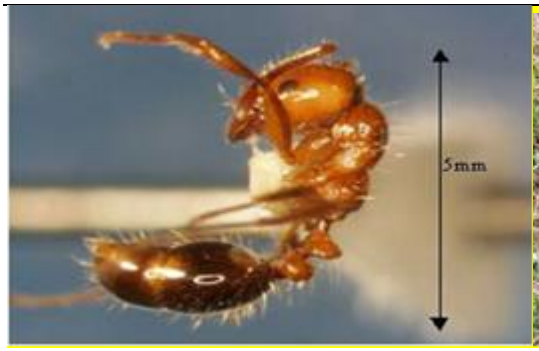
2.0 Definitions

None

3.0 Procedure

PROCESS STEP	RESPONSIBILITY	TASK DETAILS	REFERENCE DOCUMENT
3.1 Environmental Aspects	**Project Manager** **Site Supervisory Staff**	Fire Ants are a declared 'notifiable pest' under the Plant Protection Act 1989 and pose serious social, economic and environmental impacts. These impacts include: • Painful burning and itching stings to people and domestic animals. In some cases, serious allergic reactions can occur if medical attention is not sought; • Reduce and/or loss of native species of small ground fauna, such as insects, spiders, lizards, frogs, birds and mammals through fire ants aggressively preying and feeding on such fauna. Feeding on insects and animals that pollinate native plants is also a major threat; • Consuming or damaging seeds can results in major changes to ecosystems; • Effects on agriculture such as attacking newborn or hatching animals, infestation of food and water supplies, tunnelling through roots systems of plants and consuming seeds, assist in spread of diseases.	**Environmental Protection Act 1994 (Department of Environment and Heritage Protection)** **Site Specific IPMP or CEMP**
3.2 Control Measures	**Project Manager** **Site Supervisory Staff**	Control of Fire Ants on our construction sites involves firstly identification followed by the correct management procedures. Failure to manage fire ants may be considered an offence under the Plant Protection Act 1989 and Biosecurity Queensland.	**Environmental Protection Act 1994 (Department of Environment and Heritage Protection)**
3.3 Fire Ant Identification	**Project Manager** **Site Supervisory Staff**	Fire ants are generally found around South East Queensland ((refer Fire and map – Biosecurity Qld). Fire ants are small ants approximately 2-6mm in size with a coppery-brown coloured head and body and darker abdomen. Fire ants are particularly aggressive near their nests and nests can be of various shape and size but are usually dome shaped mounds up to 40cm high. There are no obvious entry or exit holes and nest can contain a variety of ant sizes. Nests can be found in areas such as lawns, pastures, along roadsides, next to or under other objects such as logs, rocks or bricks, and also in buildings or electrical equipment. The fire ant and their nests are shown in the following pictures:	**Work Health and Safety Act and Regulations 2011** **Site Specific IPMP or CEMP**

FIRE ANT MANAGEMENT (WINBMS-EP-21)





PROCESS STEP	RESPONSIBILITY	TASK DETAILS	REFERENCE DOCUMENT
3.4 Fire Ant Management	**Project Manager** **Site Supervisory Staff**	Fire Ant Management on our construction sites is generally an issue where we may be required to move restricted items into and out Fire Ant Restricted Areas. Restricted items that may be encountered on our sites include: • soil (includes fill, clay, overburden, scrapings, topsoil, decomposed granite (deco), potting media and any other material from the ground) • mulch • manure • bark • baled hay • turf • sleepers/logs • gravels If our activities require the movement of restricted items into or out of the Fire Ant Restricted Area, refer to Section 4.0 Monitoring and Reporting.	**Environmental Protection Act 1994 (Department of Environment and Heritage Protection)** **Site Specific IPMP or CEMP**
2.5 Monitoring and Reporting	**Project Manager** **Site Supervisory Staff**	To report a Fire Ant sighting contact Biosecurity Queensland through the Department of Agriculture, Fishing and Forestry (DAFF) on their website http://www.daff.qld.gov.au/31_846.htm. If our activities require the movement of restricted items into or out of the Fire Ant Restricted, a Biosecurity Inspector's approval is required prior to movement. An inspector can be requested from Biosecurity Queensland on 13 25 23.	**Environmental Protection Act 1994 (Department of Environment and Heritage Protection)**

APPENDIX B

RISK MANAGEMENT FORMS

HAZARDOUS SUBSTANCES and SDS REGISTER

Project: Stg 1,Courtney Dr, Upper Coomera	Job No: 17987

Item No:	Project Description (Name, Manufacturer)	Supplier (Date, Supplier)	Quantity (Litres or Kg's)	Use of Product (Product used for what? application method, e.g. Spray)	Containers Label, Ok? (Yes, No)	Storage Location	SDS (Ref. No. & Issue Date)	Main Hazards (List main hazards stated in SDS, e.g., harm to eyes/skin; emissions of gases; any req'd PPE?)
1	Petrol	Shell	Various	Fuel	Yes	Container	June 21	Flammable Liquid
2	Diesel	Shell	Various	Fuel	Yes	Container	June 21	Flammable Liquid

HAZARDOUS SUBSTANCES and DANGEROUS GOODS RISK ASSESSMENT

Product Name:				
Date of Assessment:		Storage Location:		
Hazardous substance:	☐ Yes ☐ No	SDS Reference Number & Date:		
Dangerous Good:	☐ Yes ☐ No	Class:	UN Number:	Scheduled Poison:
Signal Word: DANGER / WARNING		Used by (occupation):		

Hazard Class:	**(tick the appropriate box)**
 Severe Health Hazards	☐
 Health Hazards	☐
 Acute Toxicity	☐
 Explosive	☐
 Flammable	☐
 Oxidising	☐
 Corrosive	☐
 Gases under pressure	☐
 Environmental Hazard	☐

Adequacy of current controls		
Current controls are inadequate if not present when SDS requires them or if not functioning well. A 'no' under OK means action is needed. Consider each control – does the SDS recommend it, and is it present?		
	Present	OK
Isolation	☐ Yes ☐ No	☐ Yes ☐ No
Local extraction ventilation	☐ Yes ☐ No	☐ Yes ☐ No
General ventilation	☐ Yes ☐ No	☐ Yes ☐ No
Natural ventilation	☐ Yes ☐ No	☐ Yes ☐ No
Other engineering controls	☐ Yes ☐ No	☐ Yes ☐ No
Safe work methods (e.g. pumping instead of pouring)	☐ Yes ☐ No	☐ Yes ☐ No
Reduce quantity and/or concentration	☐ Yes ☐ No	☐ Yes ☐ No
Information (at least MSDS and label)	☐ Yes ☐ No	☐ Yes ☐ No
Ongoing training (hazards, safe use, PPE, health surveillance if applicable)	☐ Yes ☐ No	☐ Yes ☐ No
Personal protective equipment (list):	☐ Yes ☐ No	☐ Yes ☐ No
Other measures		
First aid supplies/equipment (e.g. safety shower)	☐ Yes ☐ No	☐ Yes ☐ No
First aid training	☐ Yes ☐ No	☐ Yes ☐ No
Evacuation plan, emergency plan, and required emergency equipment	☐ Yes ☐ No	☐ Yes ☐ No
Other controls (specify):	☐ Yes ☐ No	☐ Yes ☐ No

Monitoring	Needed	Present	Results ok
Health surveillance program	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Air monitoring program	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

Conclusion:☑

- ☐ Risks not significant now and not likely to increase
- ☐ Risks significant but effectively controlled at the moment
- ☐ Risks significant and not adequately controlled at the moment
- ☐ Uncertain about risks; more detailed assessment required

Action required to reduce risks: *(list changes needed, by when and by whom, attach further pages if needed)*

☐ Yes (specify): Date completed:

☐ No Signature:

Comments:

Assessment carried out by:	Signature:	Date:
Assessment approved by (person in charge):	Signature:	Date:
Next assessment due:		

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

1 OBJECTIVE OF ASSESSMENT

To identify, evaluate for significance, monitor and communicate the environmental impacts and aspects of Winslow's construction activities on the Stg 1,Courtney Dr, Upper Coomera.

2 SCOPE OF ASSESSMENT

This applies to all products, services and activities that Winslow has control over which it can be expected to have an influence, including those carried out by subcontractors.

Note: Any project undertaken by Winslow with an activity that is not addressed by this Risk Assessment - or a subcontractor Environmental Plan and risk assessment shall have a risk assessment completed by the Project Manager and be included in the Integrated Project Management Plan (IPMP).

3 PROCESS

3.1 Environmental Impacts

Winslow has adopted a process line model to facilitate continuous improvement of its business activities. The assessments of products / activities undertaken by Winslow that have an environmental impact include:

1. Clearing
2. Bulk Earthworks
3. Trenching
4. Drainage

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

ENVIRONMENTAL RISK ASSESSMENT

The following risk assessment of Winslow's activities has been reviewed for implementation on the Stg 1,Courtney Dr, Upper Coomera project. Also refer to the attached;

- Probability and consequences tables, and

(Note: all implemented control measures must reduce the residual risk to a moderate or low level)

RISKS	OBJECTIVE	Inherent Risk (Tables 1 & 2)	STRATEGY	Residual Risk
PRELIM WORKS				
Site Establishment	Minimise the risk of environmental harm from site establishment activities	B3 High	Ensure IPMP is completed prior to commencing site establishment and all nominated site control measures are in place.	D1 Low
Licenses, Permits and Approvals Work being undertaken on South Place Stage 1 & 2 without the correct licenses and fines being issued.	To ensure all licenses required are identified and applied for well prior to commencement of construction.	B4 Extreme	Upon receipt of licenses, all conditions they are to be appropriately communicated to all personnel on site during the site induction process.	D1 Low

WINSLOW

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

RISKS	OBJECTIVE	Inherent Risk (Tables 1 & 2)	STRATEGY	Residual Risk
PROCUREMENT		B		B
Plant and Equipment Leaking of oil and/or fuel from equipment. Excessive air pollution from exhaust emissions. Excessive noise from operating plant. Excessive vibration from operating equipment.	Minimise the risk of environmental harm from the operation of plant and equipment.	B3 High	To ensure plant and equipment procured for the project is fully inspected and is in good condition and well maintained before commencement of work on site and throughout the project. Refer to the Plant Authorisation Inspection Checklist (WINBMS-OP-03-F). Ensure appropriate spill kits available at the workface and that all of the environmental requirements of project are well communicated during the site induction process.	E2 Low
Labour Workers untrained in environmental controls and management. Low commitment to environmental protection.	To ensure that all employees working on the project are committed to environmental protection and willing to undertake appropriate training.	D3 Medium	Induction, training and ongoing education of all project workers to ensure good knowledge of environmental issues onsite, as well as the appropriate use and maintenance of environmental controls. In addition, provide site employees with easy and clear access to project employees with appropriate environmental knowledge.	D2 Low
Subcontractor Subcontractors untrained in environmental controls and management.	To ensure that all subcontractors working on the project are committed to environmental protection and	A2 High	Induction, training and ongoing education to ensure good knowledge of environmental issues on-site, as well as the appropriate use and maintenance of environmental	D2 Low

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

RISKS	OBJECTIVE	Inherent Risk (Tables 1 & 2)	STRATEGY	Residual Risk
Low commitment to environmental protection.	willing to undertake appropriate training.		controls. Provide contractors with easy access to project employees with appropriate environmental knowledge.	
Materials Weed seeds and/or weeds being brought onto site in imported materials. Hazardous materials being stored on site inappropriately with environmental damage occurring subsequently.	To ensure that all materials procured for the project are weed and fire ant free and stored appropriately on-site to minimise environmental risks.	B3 High	All materials, as appropriate, should be certified as weed-free prior to acceptance on-site. All materials with the potential to impact on the environment should be stored in compliance with the applicable licenses, standards and IPMP. Implement Winslow's Fire Ant management Requirements for the site.	E1 Low
Work being conducted that does not comply with license conditions and environmental damage occurring.	To ensure all licenses requirements are identified and implemented prior to construction.	B2 High	Upon approval of licenses, all conditions are complied with at all times and fully communicated during the site induction process.	E2 Low

WINSLOW

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

Risk (Aspect)	Potential Impact	Inherent Risk (Tables 1 & 2)	Control Measures	Residual Risk
Construction				
Air quality	Fumes and dust can be generated by construction and maintenance equipment. Dust can be generated from clearing operations. Clearing activities at the site have the potential to create large amounts of dust, which could affect flora and fauna and surrounding stakeholders. If significant amounts of dust settle on vegetation, it could affect the health of the vegetation and impact on fauna that feed on the vegetation.	D3 Medium	Visual Monitoring Weekly Inspection Records Water Dust Suppression Education / Site Inductions	E2 Low
Water contamination	Inadequate sediment control procedures or heavy rainfall periods may lead to contamination of the local creeks or other nearby waterways. Contamination could be from oil associated with construction equipment. Recycled water potential to transport pathogens and microbes	B4 Extreme	Implement Acid Sulphate Soil Management Plan if required Site Erosion & Sedimentation Control Plan Site Inspections / monitoring Education / Site Inductions Use of potable water versus recycled water	E2 Low

WINSLOW

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

Risk (Aspect)	Potential Impact	Inherent Risk (Tables 1 & 2)	Control Measures	Residual Risk
Soil erosion and stability	Where exposed by removal of vegetation and consequent loss of stabilising root systems, or where exposed by clearing are the subject of erosive forces by wind and water due to the lack of soil stability. Erosion will contribute to the sedimentation and increased turbidity of water courses. Erosion and sedimentation can adversely affect drainage capacity and drainage patterns as well as impact on any adjacent vegetation habitat areas and species composition.	B3 High	Site Erosion & Sedimentation Control Plan Site Inspections Education / Site Inductions	E2 Low
Flora and Fauna	Noise and vibration levels are likely to increase during clearing operations which may disturb native fauna. Physical disturbance within areas of the native vegetation would generally promote weed colonisation from other areas.	A4 Extreme	Education / Site Inductions Education and Site Inspections No Go zones Habitat and species translocation Relative approved permits Any necessary approvals (both written and verbal)	D2 Low
Noise and vibration	The major potential generation of noise during the construction period	D3	Hours of Work – 6:30am to 6pm	D2

WINSLOW

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

Risk (Aspect)	Potential Impact	Inherent Risk (Tables 1 & 2)	Control Measures	Residual Risk
	is the operation of vehicles, plant and equipment, trucks. Ground vibrations generated during clearing has the potential to cause disturbance to property and/or nuisance.	Medium	Monitor complaints Smaller plant to be utilised if required	Low
Natural Resources	Natural resources are affected by the removal of trees and vegetation and site generated waste.	A2 High	Education / Site Inductions	E2 Low
Community Resources	Community resources are affected by the removal of trees, use of community assets, use of local infrastructure and possible damage to other utility services. The visual impact that results from the loss of a natural environment and the potential for the loss of flora and fauna habitats.	B3 High	Education / Site Inductions Site Inspections	E3 Low
Transport	Work carried out during clearing operations may create a disruption to transport and pedestrian flow in work areas. The use of construction	B2 High	Traffic Management Plan Education / site induction Carbon reduction where possible by substituting plant used on site	E2 Low

WINSLOW

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

Risk (Aspect)	Potential Impact	Inherent Risk (Tables 1 & 2)	Control Measures	Residual Risk
	plant results in the emission of Greenhouse Gasses.			
Waste Generation	The potential still exists for litter from construction workers to impact upon the habitat conditions of local flora and fauna. Refuse, construction, sanitary and equipment waste should always be disposed of correctly. Decomposing plant material stored on site can produce contaminates	B3 High	Recycle and use recycle materials whenever viable. Education / Site Inductions Visual water monitoring	E1 Low
Wind Blown Dust / Soil	Soil and dust blowing over the existing houses	B4 Extreme	Keep mulch piles damp if possible. Site Inspections	E2 Low
Oil and Fuel Spills and Leaks	Occurs when machines blow hydraulic hoses, machinery leaks oil/fuel, re-fuelling plant, incorrect storage of oil/fuel.	B4 Extreme	Spill kits available, kept re-stocked on-site and staff well informed on their use. Mopped up spills to be disposed of correctly Fuelling of plant only to be done by experienced personnel in designated areas Spill kit on refuelling vehicle Plant checks to be done daily to identify any leaks	D2 Low

ENVIRONMENTAL ASPECTS AND IMPACTS REGISTER

Risk (Aspect)	Potential Impact	Inherent Risk (Tables 1 & 2)	Control Measures	Residual Risk
			Fuel/Oil stored on-site to be in proper containers and be isolated from entering stormwater etc. should leakage occur.	
Fire Ants	Spread of Fire Ants causing damage to native flora and fauna.	B4 Extreme	Implement Biosecurity Qld's Fire Ant Management Requirements	E2 Low

Notes: The above table is to be read in conjunction with Winslow's RISK (ASPECTS) Classification tables 1 & 2 and the RISK (ASSESSMENT) Classification Matrix diagram

TABLE 1 - QUALITATIVE MEASURES OF PROBABILITY

Almost Certain	A	The event is expected to occur in most circumstances.
Likely	B	The event will probably occur in most circumstances.
Possible	C	The event might occur at some time.
Unlikely	D	The event could occur at some time.
Rare	E	The event may occur only in exceptional circumstances.

TABLE 2 - QUALITATIVE MEASURES OF CONSEQUENCES

People Safety		
Insignificant	1	No lost time
Minor	2	Minor lost time injury or illness
Possible	3	Moderate lost time injury or illness
Major	4	Serious lost time injury or illness
Catastrophic	5	Fatality or permanent disability
Possible Environmental Consequences		
Insignificant	1	No environmental harm or effects
Minor	2	Theoretically could affect the environment or people but unlikely. Public complaints unlikely. Unlikely to affect legal compliance.
Moderate	3	Water, soil or air likely to be affected, probably in the short term. No damage to flora or fauna. Public complaints unlikely. Prosecution unlikely. Damage costs less than $5,000.
Major	4	Water, soil or air affected badly, possibly in the long term. Damage or death to limited numbers of flora or fauna. Public complaints likely. Damage or relocation of archaeological/heritage property. Likely prosecution. Damage costs between $5,000 and $50,000.
Catastrophic	5	Long term damage to water, soil or air. Damage or death to significant numbers of flora or fauna. Many public complaints, possible evacuation. Destruction of archaeological/heritage property. Almost certain environmental prosecution. Damage costs exceeding $50,000.

RISK (ASSESSMENT) CLASSIFICATION MATRIX

Risk Assessment Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
	-1	-2	-3	-4	-5
Almost Certain -5	Low (5)	Medium (10)	High (15)	High (20)	High (25)
Likely -4	Low (4)	Medium (8)	Medium (12)	High (16)	High (20)
Possible -3	Low (3)	Medium (6)	Medium (9)	Medium (12)	High (15)
Unlikely -2	Low (2)	Low (4)	Medium (6)	Medium (8)	Medium (10)
Rare -1	Low (1)	Low (2)	Low (3)	Low (4)	Low (5)

Scores: 1-5 = Low / 6-14 = Medium / 15- 25 = High

HEALTH & SAFETY HAZARDS REGISTER

Project:	**Courtney Drive Upper Coomera**	**Date:**	**24/11/2023**
Prepared By:	**Michael Jabbour**	**Project Revision No:**	**2**
Reviewed By:	**Michael Williams**	**Approved By:**	**Michael Williams**

					Project Risk Assessment				Secondary Assessment, considering all project specific controls		
Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
Site Access and Egress *State Health & Safety Act / Regulations * AS 3745 Emergency Planning	Slips, Trips and Falls.	Public fatality or injury due to accessing work sites	Project Management Plan		Unlikely	Catastrophic	Medium 10	No public access. Adequate warning signage, Induction prior to site access. Perimeter fencing to be maintained a all times.	Rare	Catastrophic	Low
		Public and worker injuring themselves due to trip hazards	WINBMS-SP-06		Possible	Major	Medium 12	Adequate warning signage, Induction prior to site access, general housekeeping being maintained throughout the duration of the job. Weekly safety inspections, trip hazards identified and rectified immediately.	Possible	Major	Medium
		Public and worker fatality or injury due to being struck by vehicles exiting or entering work sites.	WINBMS-SP-08 TMP		Unlikely	Catastrophic	Medium 10	PPE, Adequate warning signage, Induction prior to site access, Worksite speed limited to be maintained, Adequate warning signs, separation of workers/pedestrians and traffic to be maintained where practicable. Traffic controllers to be used where required as per TGS.	Rare	Catastrophic	Low
		Worker fatality or injury due to unsafe or blocked egress in case of emergency.	WINBMS-SP-08		Rare	Catastrophic	Low 5	PPE, Adequate warning signage, Induction prior to site access. An alternative emergency exit to be implemented. Emergency Action Plan training to be carried out on a regular basis and captured as part of the toolbox.	Rare	Catastrophic	Low
Hazardous Substances & Dangerous Goods *State Health & Safety Acts / Regulations for Dangerous Goods & Hazardous Substances /Asbestos Part of Relevant State Regulations/ * Safe Work Australia Code of Practice Manage & Control Asbestos in the Workplace / How to Safely Remove Asbestos *Safe Work Australia Model Code of Practice: Managing Risks of Hazardous Chemicals in the Workplace.	Handling, transport, storage, use, spills, disposal.	Worker fatality or injury due to asphyxiation or lung damage from inhalation of fumes.	WINBMS- SP-04 WINBMS-SP-15 WINBMS-OP-05	Induction Training	Rare	Catastrophic	Low 5	Exposure monitoring to be undertaken where it is believed that exposure levels may exceed exposure limits or where required by regulations. Restrained storage of chemicals on site, less hazardous goods to be substituted where possible. Dangerous goods to be used in ventilated area. Correct PPE to be worn where necessary. Correct signage to be installed at storage areas.	Rare	Catastrophic	Low
		Worker injury due to chemical burns to body from spill on skin.	WINBMS-OP-05	Induction Training	Unlikely	Moderate	Medium 6	Restrained storage of chemicals on site, less hazardous goods to be substituted where possible. Appropriate PPE and signage as required by SDS. Appropriate washing facilities to be provided where necessary.	Unlikely	Moderate	Medium
		Worker fatality or injury due to internal organ damage from ingestion of substances.	WINBMS-OP-05	Induction Training	Rare	Catastrophic	Low 5	Restrained storage of chemicals on site, less hazardous goods to be substituted where possible. All chemicals to be clearly marked and never to be decanted into unmarked containers. Appropriate PPE require by SDS.	Rare	Catastrophic	Low
		Worker injury with blindness due to chemical contact with eyes	WINBMS-OP-05	Induction Training	Unlikely	Catastrophic	Medium 10	Restrained storage of chemicals on site, less hazardous goods to be substituted where possible. Appropriate PPE required by SDS, all first aid kits to be easily accessible and have eye washing facilities available	Unlikely	Catastrophic	Medium
		Worker fatality or injury due to burns on body from inflammable chemicals	WINBMS-OP-05	Induction Training	Possible	Catastrophic	High 15	Restrained storage of chemicals on site, less hazardous goods to be substituted where possible. Appropriate tested and tagged Fire extinguishers available and working	Unlikely	Catastrophic	Medium
		Public fatality or injury due to chemical fire entering adjoining properties	WINBMS-OP-05	Induction Training	Rare	Catastrophic	Low 5	Restrained storage of chemicals on site Chemicals stored away from existing houses. Appropriate Hazchem signage where appropriate.	Rare	Catastrophic	Low
		Worker fatality or injury due to incorrect storage of chemicals	WINBMS-OP-05	Induction Training	Unlikely	Catastrophic	Medium 10	storage of chemicals on site as per SDS	Unlikely	Catastrophic	Medium
		Worker incapacitated or dying from contracting	WINBMS-OP-05 WINBMS-EP-06	Induction Training	Rare	Catastrophic	Low 5	If asbestos (or suspected asbestos) is located on site area to be barricaded and PM contacted and the substance is to be removed by a suitably qualified sub-contractor.	Rare	Catastrophic	Low

HEALTH & SAFETY HAZARDS REGISTER

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Reviewed By:	**Michael Williams**	**Approved By:**	**Michael Williams**

					Project Risk Assessment				Secondary Assessment, considering all project specific controls		
Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
		asbestosis due to excavating AC pipe									
		Worker or public fatality or injury due storage of chemicals in unprotected places	WINBMS-OP-05	Induction Training	Rare	Catastrophic	Low 5	storage of chemicals on site as per SDS, No Public access to site	Rare	Catastrophic	Low
		Worker fatality or injury due to poisoning or burns from storing chemicals in unlabelled decanters	WINBMS-OP-05	Induction Training	Unlikely	Catastrophic	Medium 10	storage of chemicals on site as per SDS, less hazardous goods to be substituted where possible. All chemicals to be clearly marked and never to be decanted into unmarked containers. Adequate labels on all chemicals	Rare	Catastrophic	Low
Trenching / Excavation *State Health & Safety Act / Regulations *Safe Work Australia Model Code of Practice - Excavation Works *Safe Work Australia National Code of Practice - Prevention of Falls in General Construction *Model Safe Work Australia Code of Practice - Managing the Risk of Falls at Workplaces	Collapse, slipping or falling into excavation, striking overhead or underground assets, struck by falling objects.	Worker fatality or injury due to trench wall collapsing	WINBMS-OP-04	Mine Manager Ticket or Trenching & Shoring Ticket	Possible	Catastrophic	High 15	Trenches greater than 1.5 meters, batter/bench sides of trench or use shields where needed. Trench safety checklist completed daily and internal permit to work to be completed and authorised prior to any excavation works commencing	Unlikely	Catastrophic	Medium
		Worker fatality or injury due to debris or tools falling on personnel in the trench.	WINBMS-OP-04	Induction/ SWMS Training	Possible	Catastrophic	High 15	Tools & equipment to be kept a minimum 1m away from trench edge. Hard hats worn on site at all times	Unlikely	Catastrophic	Medium
		Worker fatality or injury due to falling into trench/shaft	WINBMS-OP-04	Induction/ SWMS Training	Possible	Catastrophic	High 15	Barricading to be installed around all open trenches/Shafts as per code of practice. Excavation COP	Unlikely	Catastrophic	Medium
		Worker fatality or injury due to unsafe access & egress to trench	WINBMS-OP-04	Induction/ SWMS Training	Possible	Catastrophic	High 15	Proper means of fall protection and access and Egress and to be maintained throughout duration of the job.	Unlikely	Catastrophic	Medium
		Worker injury due to throat or lung injury from dust	WINBMS-OP-15	Induction/ SWMS Training	Unlikely	Moderate	Medium 6	Water cart to spray water onsite when required to suppress dust All materials to be delivered to site as per SDS	Rare	Moderate	Low
		Worker fatality or injury due to asphyxiation by hazardous fumes in trench	WINBMS-SP-04 WINBMS-OP-07	Confined Space Entry Training	Unlikely	Catastrophic	Medium 10	Risk Assessment of confined space to be undertaken prior to entry if deemed to be a confined space then Confined space entry procedure and permit system required where applicable. Confined space rescue plan to be implemented and known by all on site. Air Quality to be monitored as per procedure. All staff working in confined space to receive confined space entry training and competency.	Rare	Catastrophic	Low
		Worker fatality or injury due to electrocution from striking underground services	WINBMS-OP-04 PERMIT TO WORK: SERVICES	Spotter Ticket	Possible	Catastrophic	High 15	DBYD to be obtained and updated as required. Permit to work to be completed prior to excavation. Asset Protection Plan developed. All services to be located and proved by non-destructive means and clearly marked and locations known by all staff. Maintain Limit of approach distances	Unlikely	Catastrophic	Medium
		Worker fatality or injury due to electrocution from striking overhead services	WINBMS-OP-04 PERMIT TO WORK: SERVICES	Spotter Ticket	Possible	Catastrophic	High 15	Maintain "No Go Zone" distances any work that needs to take place closer than approach limits permission must be obtained from service authority, SWMS & Training. No works to be completed in the vicinity of power lines without a trained spotter present	Unlikely	Catastrophic	Medium

HEALTH & SAFETY HAZARDS REGISTER

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Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
		Worker burnt or asphyxiated due to striking underground gas services	WINBMS-OP-04 PERMIT TO WORK: SERVICES		Possible	Catastrophic	High 15	DBYD to be obtained and updated. Winslow permit to work to be completed prior to excavation. Asset Protection Plan developed. All services to be located and proved by non-destructive means and clearly marked and locations known by all staff. No works to be completed near gas lines without a spotter and service authority permit where required	Unlikely	Catastrophic	Medium
		Public injury or fatality due to falling into trench	WINBMS-OP-04		Rare	Catastrophic	Low 5	Appropriate barricading to be installed and maintained.	Rare	Catastrophic	Low
Lifting *State Health & Safety Act/Regulations *AS 1418.8 Cranes (Special Purpose Appliance) *AS 4772 Quick hitches	Falling objects, plant overturn, public or property damage.	Worker fatality or injury due to plant overturning from load being too heavy	WINBMS-SP-08 WINBMS-OP-03 WINBMS-SP-09	Ticketed Operator	Possible	Catastrophic	High 15	Clear Zones to be maintained. SWL clearly displayed on excavator boom. Plant only to lift loads of known weights. Plant not to lift loads in excess of SWL. Only designated lifting points used for lifting.	Unlikely	Catastrophic	Medium
		Worker fatality or injury due to plant overturning from unbalanced load	WINBMS-OP-09	Ticketed Operator	Possible	Catastrophic	High 15	Clear Zones to be maintained. SWL clearly displayed on excavator boom. Plant only to lift loads of known weights. Plant not to lift loads in excess of SWL. Only designated lifting points used for lifting.	Rare	Catastrophic	Low
		Worker fatality or injury due to being crushed by falling object / load	WINBMS-OP-09	Ticketed Operator	Unlikely	Catastrophic	Medium 10	Only plant with burst valve protection to be used for lifting. Clear Zones to be maintained. SWL clearly displayed on excavator boom. Plant only to lift loads of known weights. Plant not to lift loads in excess of SWL. Only designated lifting points used for lifting. Only tagged slings/chains that are in good working condition to be used for lifting.	Rare	Catastrophic	Low
		Property or plant damaged by falling object	WINBMS-OP-09	Ticketed Operator	Unlikely	Moderate	Medium 6	Clear zones to be maintained. Lifting not to be done over personnel or plant. SWL clearly displayed on excavator boom. Plant only to lift loads of known weights. Plant not to lift loads in excess of SWL.	Rare	Moderate	Low
		Public fatality or injury due to falling objects or overturning plant	WINBMS-OP-09	Ticketed Operator	Rare	Catastrophic	Low 5	Signs, Barriers in place. Clear Zones To Be Maintained No public access to site.	Rare	Catastrophic	Low
Manual Handling *Manual handling section of the State Regulations *Safe Work Australia Model Code of Practice - Hazardous Manual Tasks	Pushing, pulling, bending, reaching, lifting	Worker physical injury due to load too heavy	WINBMS-OP-06	Induction Training	Possible	Moderate	Medium 9	Risk assessments to be carried out. Use appropriate plant and equipment to shift loads. Manual handling as per SWMS and COP	Unlikely	Moderate	Medium
		Worker physical injury due to load not being stable	WINBMS-OP-06	Induction Training	Possible	Moderate	Medium 9	Appropriate stacking of materials to ensure easy loading/unloading. Use appropriate plant and equipment to shift loads.	Rare	Moderate	Low
		Worker injury due to repetitive nature of work	WINBMS-OP-06	Induction Training	Possible	Moderate	Medium 9	Risk Assessments carried out on all repetitive tasks. Repetitive tasks to be rotated.	Unlikely	Moderate	Medium
		Worker physical injury due to not lifting in correct manner	WINBMS-OP-06	Induction Training	Likely	Moderate	Medium 12	Manual handling COP to be followed to ensure correct lifting techniques are implemented. Mechanical aids provided where appropriate	Possible	Moderate	Medium
		Worker hand injury due to handling sharp objects	WINBMS-OP-06	Induction Training	Likely	Minor	Medium 8	Toolbox to be in correct use of PPE through toolboxes. All sharp objects to be capped Gloves to be provided as required	Unlikely	Minor	Low
		Worker fatality or injury due to electrocution from electrical hand tools	WINBMS-OP-03	Induction Training	Unlikely	Catastrophic	Medium 10	Safe use of electrical hand tools for all relevant staff through toolboxes and SWMS. All equipment to be kept in good condition. All generators to be appropriately earthed and have RCD's Test and tagging to be completed on all electrical equipment as required.	Rare	Catastrophic	Low
		Worker injury due to vibrating equipment	WINBMS-OP-06	Induction Training	Possible	Moderate	Medium 9	Risk assessments carried out on manual tasks. Repetitive tasks to be rotated.	Unlikely	Moderate	Medium

HEALTH & SAFETY HAZARDS REGISTER

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					Project Risk Assessment				Secondary Assessment, considering all project specific controls		
Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
		causing soft tissue damage									
Working in Extreme (hot & cold) or Hostile Environments *State Health & Safety Act / Regulations *Safe Work Australia Model Code of Practice: Construction Work	UV exposure, radiant heat, frost, snow, ice, dangerous plants & animals	Worker becoming sick due to heat exhaustion	WINBMS-SP-06 EBA	Induction Training	Unlikely	Moderate	Medium 6	A decision to suspend work activities will be made in accordance with EBA. Manual tasks to be performed earlier in the day and rotated. Extra rest breaks to be provided when works must continue through hot temperatures as directed by the relevant EBA. Shade to be provided where possible along a plentiful supply of cool fresh drinking water.	Rare	Moderate	Low
		Worker public & property burnt due to a fire on "Total Fire Ban" day	WINBMS-SP-08	Induction Training	Possible	Catastrophic	High 15	No hot work to be done on total fire ban days. Fire extinguisher on hand at all times. Hot work permit to be issued for all hot works	Unlikely	Catastrophic	Medium
		Worker becoming sick due to fatigue	WINBMS-SP-06 EBA	Induction Training	Unlikely	Moderate	Medium 6	Appropriate Rest Breaks Taken. Staff performing Manual tasks to be rotated. Work scheduling and planning	Rare	Moderate	Low
		Worker becoming sick due to hypothermia	WINBMS-OP-04	Induction Training	Rare	Moderate	Low 5	Adequate facilities with a means of heating to be provided. Appropriate cold weather PPE issued.	Rare	Moderate	Low
		Worker becoming ill due to skin burnt from exposure to sun	WINBMS-OP-04	Induction Training	Possible	Minor	Medium 6	Appropriate PPE issued and enforced on site. Training to all personnel through toolboxes and SWMS with regard to UV exposure and controls. Posters displayed on all sites.	Rare	Minor	Low
		Worker fatality or injury due to lack of control of plant from muddy, slippery conditions	WINBMS-SP-06 WINBMS-OP-03	Ticketed Operator	Rare	Catastrophic	Low 5	Plant Risk assessment. All conditions to be monitored by supervisor in consultation with HSR and relevant workers. Works to be ceased when conditions are unsafe. All ground personnel and site vehicles to be kept separate from working plant wherever possible.	Rare	Catastrophic	Low
		Worker fatality or sick due to snake, spider, or insect bites	WINBMS-EP-13		Rare	Catastrophic	Low 5	Appropriate first aid equipment and training as required on site	Rare	Catastrophic	Low
Traffic Management *State Health & Safety Act / Regulations *AS 1742 Manual of Uniform Traffic Control *Relevant State Traffic Guides	Vehicles and moving plant working on site (entering and exiting), working in close proximity to road traffic, directing traffic through and around work site, visibility, traffic noise & fumes	Worker injury or fatality due to being struck by public or site vehicle	WINBMS-OP-08 TMP	Appropriate Traffic management ticket	Possible	Catastrophic	High 15	Appropriate TGS developed by suitably qualified traffic controller / designer and TMP in place. Workers and Traffic to be delineated with the highest forms of controls as practicable. E.g. Traffic detoured, barriers installed.	Unlikely	Catastrophic	Medium
		Worker or public fatality or injury due to collision with construction plant and equipment and/or leaving designated traffic route (collision, roll-over)	WINBMS-OP-08 TMP	Appropriate Traffic management ticket	Possible	Catastrophic	High 15	Appropriate TGS developed by suitably qualified traffic controller / designer and TMP in place. Internal plans for movement of vehicles and plant must be developed which includes entry and exit points to ensure the flow of internal traffic is controlled in a manner which eliminates or reduces as far as practicable the need for vehicles or plant to reverse. Workers and Traffic to be delineated with the highest forms of controls as practicable. When installing or removing traffic delineation devices always use the highest possible form of controls such as elimination of the hazard. Divert traffic if practical. Use devices to separate worker and traffic if diversion is not possible as directed in the TGS.	Unlikely	Catastrophic	Medium
		Worker or public fatality or injury due to accident because of materials on road, mud, water, gravel etc.	WINBMS-EP-12		Likely	Catastrophic	High 20	Rumble Grid or truck wash as per EMP to be installed Daily inspection of all roads conducted	Unlikely	Catastrophic	Medium
		Public fatality or injury due to traffic congestion or	WINBMS-OP-08 TMP	Appropriate Traffic	Possible	Catastrophic	High 15	Road closure permit in place. Approved TGS developed by a suitably qualified traffic plan	Unlikely	Catastrophic	Medium

HEALTH & SAFETY HAZARDS REGISTER

Project:	**Courtney Drive Upper Coomera**	**Date:**	**24/11/2023**
Prepared By:	**Michael Jabbour**	**Project Revision No:**	**2**
Reviewed By:	**Michael Williams**	**Approved By:**	**Michael Williams**

					Project Risk Assessment				Secondary Assessment, considering all project specific controls		
Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
		confusion from traffic controls, signs not being taken down when finished		management ticket				developer & MOA. Traffic Control checklist (Daily Inspections)			
		Worker injury due to fuel fumes, dust inhalation or eye irritation	WINBMS-EP-15		Unlikely	Minor	Low 5	Air quality monitoring if required, Plant only used in open air. PPE where required	Rare	Minor	Low
		Pedestrian injury or fatality due to site or company vehicles running over them when exiting or entering site	WINBMS-OP-08 TMP		Unlikely	Catastrophic	Medium 10	All pedestrian access to be delineated from worksite. Traffic controllers in place in heavy pedestrian areas.	Rare	Catastrophic	Low
Amenities @ Project Sites *State Health & Safety Act / Regulations *Safe Work Australia Model Code of Practice Construction Work *AS 2444 Portable Fire Extinguishers *AS 1319 Safety Signs for the occupational environment	Hygiene	Worker ill due to lack of clean eating facilities	WINBMS-SP-04 IPMP		Unlikely	Moderate	Medium 6	Good Housekeeping to be maintained.	Rare	Moderate	Low
		Worker sick due to lack of wash facilities	WINBMS-SP-04 IPMP		Unlikely	Moderate	Medium 6	Provision of proper amenities.	Rare	Moderate	Low
		Worker fatality or injury due to asphyxiation from chemicals stored in lunch or work areas	WINBMS-OP-05 IPMP		Unlikely	Catastrophic	Medium 10	Storage of all chemicals as per SDS	Rare	Catastrophic	Low
		Worker sick due to dehydration from lack of drinking water	WINBMS-SP-04 IPMP		Unlikely	Minor	Low 4	Provision of proper amenities. Plentiful supply of fresh drinking water to be provided.	Rare	Minor	Low
		Worker fatality or injury due to fire from rubbish build up	WINBMS-SP-08		Unlikely	Catastrophic	Medium 10	Good housekeeping all waste to be disposed of in the appropriate manner.	Rare	Catastrophic	Low
		Worker fatality or injury due to inhalation, eye & skin contact or ingestion of chemicals	WINBMS-OP-05 IPMP		Unlikely	Catastrophic	Medium 10	Storage of all chemicals as per SDS	Rare	Catastrophic	Low
Human Resource Management *State Health & Safety Act / Regulations *AS 3745 Planning for Emergencies *Safe Work Australia Model Code of Practice First Aid in the Workplace	Strokes, alcohol, drugs, first aid, incompetence, training register	Worker fatality or injury inflamed due to lack of first aid facilities & first aider	WINBMS-SP-08	Level 2 First Aid	Unlikely	Catastrophic	Medium 10	First Aid equipment/ trained personnel (min Level 2 First Aider) to be provided as per compliance codes. All first aid kits reviewed weekly to ensure contents are adequate and in date	Rare	Catastrophic	Low
		Worker fatality or injury inflamed due to lack of emergency procedure or contact details	WINBMS-SP-08		Unlikely	Catastrophic	Medium 10	All emergency contact numbers to be displayed including afterhours contact details. EAP to be carried out on a regular basis through toolboxes	Rare	Catastrophic	Low
		Worker fatality or injury inflamed due to lack of records about worker allergies, medication requirements or current illnesses.	WINBMS-SP-04		Unlikely	Catastrophic	Medium 10	Employee medical records as per the privacy act	Rare	Catastrophic	Low
		Worker fatality or injury due to having taken alcohol or drugs	WINBMS-SP-04		Unlikely	Catastrophic	Medium 10	Implementation of our fit for work policy.	Rare	Catastrophic	Low

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Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
		Worker fatality or injury due to worker doing jobs they are not trained for	WINBMS-SP-09		Possible	Catastrophic	High 15	Training assessments needs to be undertaken on site prior to works being undertaken. Appropriate training to all personnel through preferred RTO or toolboxes and SWMS.	Unlikely	Catastrophic	Medium
Work Stress *State Health & Safety Act / Regulations *Fairwork Australia Act *Relevant State Discrimination Acts *Relevant State Bulling Guides & Legislation	Less favourable treatment, sexual harassment, Bullying.	Person being less favourably treated in the workplace	WINBMS-SP-04		Possible	Moderate	Medium 9	Promote principles of equal opportunity> Winslow Issue Resolution flow chart to be followed	Unlikely	Moderate	Medium
		Worker Injured or killed due to Fatigue and stressor.	WINBMS-SP-04		Unlikely	Catastrophic	Medium 10	Scheduling of work hours within normal day light hours where possible	Rare	Catastrophic	Low
		Person being bullied in the workplace	WINBMS-SP-04		Unlikely	Moderate	Medium 6	Disciplinary action against persons found to engage in harassment or workplace bullying. Winslow Issue Resolution flow chart to be followed	Rare	Moderate	Low
		Person being sexually harassed in the workplace	WINBMS-SP-04		Unlikely	Moderate	Medium 6	Disciplinary action against persons found to engage in harassment or workplace bullying. Winslow Issue Resolution flow chart to be followed	Rare	Moderate	Low
Plant and Machinery *State Health & Safety Act / Regulations (Plant) *Safe Work Australia Model Code of Practice: Managing Risks of Plant in the Workplace *AS 1418.8 Cranes-Special Purpose. *AS 4772 Earthmoving equipment-quick hitches *AS 2294.1 Earth moving machinery - Protective structures *AS 2397 Guide to safe use of lasers in the construction industry	Rollover, noise, use of lasers, power tools, dust, vibration, falling objects, exhaust emissions, dust, visibility, ergonomics - Excavators, loaders, trucks.	Works fatality or injury due to being struck by moving equipment	WINBMS-OP-03	Ticketed operator	Unlikely	Catastrophic	High 15	Workers and traffic to be delineated where possible. Personnel to keep clear of swing area of plant until they receive acknowledgement form operator. Training to all staff through toolboxes and SWMS. Plant Hazard Assessment undertaken on all plant. Hi-vis PPE to be worn at all times, Red Zone procedure to be followed	Unlikely	Catastrophic	Medium
		Worker losing hearing due to noisy power tools or equipment	WINBMS-SP-04	Induction Training	Possible	Moderate	Medium 9	Training in correct use of PPE to all staff through toolboxes and SWMS. Risk assessment carried out on all plant and equip. All plant and equip to maintained in good condition. Hearing protection to be provided. Two Yearly audiometric test for all staff.	Unlikely	Moderate	Medium
		Worker Fatality/injury or plant or property damaged due to tip truck trailer overturning whilst dumping material on site.	WINBMS-OP-12	Ticketed operator	Possible	Catastrophic	High 15	SWMS to be strictly complied with. No go zones of 30m from tipping trucks to maintained at all times. Trucks only to tip loads when safe to do so.	Unlikely	Catastrophic	Medium
		Worker fatality or injury due to plant accident from plant failure	WINBMS-OP-03	Ticketed operator	Unlikely	Catastrophic	Medium 10	Plant Hazard assessment/Prestart checklist/Regular Maintenance. Workers and traffic to be delineated	Rare	Catastrophic	Low
		Worker fatality or injury due to plant overturning on unstable ground	WINBMS-SP-08 WINBMS-SP-06	Ticketed operator	Unlikely	Catastrophic	Medium 10	ROPS installed on plant where possible. Seat belts to be worn when fitted. All operators must hold a competency ticket for plant being operated. Non-Winslow personnel must undertake VOC. Workers and traffic to be delineated. Training to all relevant personnel through toolboxes & SWMS. Risk Assessment.	Rare	Catastrophic	Low
		Worker injury or fatality due to plant collisions	WINBMS-SP-06	Ticketed operator	Possible	Catastrophic	High 15	Workers and traffic to be delineated where possible. All operators to hold appropriate competency for plant. All personnel and plant to keep clear of swing area of plant until they receive acknowledgement form operator. Training to all staff through toolboxes and SWMS.	Unlikely	Catastrophic	Medium
		Worker injury or fatality due to plant attachments not locked in with safety pin	WINBMS-OP-03		Possible	Catastrophic	High 15	Where excavators have semi-automatic quick hitches fitted safety pins must be inserted whenever the machine is working	Unlikely	Catastrophic	Medium

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Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
		Worker injury (strains & sprains) due to incorrect entry and exit of plant	WINBMS-SP-09	Ticketed operator	Unlikely	Moderate	Medium 6	All operators to hold appropriate competency tickets / logbook and further trained through SWMS and toolboxes	Rare	Moderate	Low
		Worker or public eyes damaged due to incorrect use of lasers	WINBMS-OP-03		Unlikely	Major	Medium 6	Appropriate Signage to be installed.	Rare	Major	Low
Plant and Machinery *State Health & Safety Act / Regulations (Plant) *Safe Work Australia Model Code of Practice: Managing Risks of Plant in the Workplace *AS 1418.8 Cranes-Special Purpose. *AS 4772 Earthmoving equipment-quick hitches *AS 2294.1 Earth moving machinery - Protective structures *AS 2397 Guide to safe use of lasers in the construction industry	Rollover, noise, use of lasers, power tools, dust, vibration, falling objects, exhaust emissions, dust, visibility, ergonomics - Excavators, loaders, trucks.	Worker fatality or injury due to being crushed by falling object	WINBMS-SP-08 WINBMS-SP-06 WINBMS-OP-09		Unlikely	Catastrophic	High 15	Personnel to be separated from working plant where possible. Personnel must be separated from raised loads and never work under raised loads. Only Plant with burst valve protection to be used for lifting works. Lifting equipment must only be attached to designated lifting points. Plant must only lift loads up to the plants rated capacity. Training through toolboxes and SWMS for all workers	Rare	Catastrophic	Low
		Worker injury due to musculoskeletal disorders from unergonomic equipment	WINBMS-OP-03		Possible	Major	Medium 12	Correct posture to be maintained whilst preforming tasks	Unlikely	Major	Medium
		Public injury or fatality due to unauthorized use of equipment	WINBMS-SP-09	Ticketed operator	Rare	Catastrophic	Low 5	Only licensed / logbook personnel to operate plant and machinery.	Rare	Catastrophic	Low
		Operator fatality or injury due to being thrown out of plant	WINBMS-SP-09		Unlikely	Catastrophic	Medium 10	Only personnel with appropriate competency tickets to operate plant. Occupants' restraints to be worn at all times.	Rare	Catastrophic	Low
		Worker could drown / plant could roll over into waterway	WINBMS-SP-09		Unlikely	Catastrophic	High 15	No go zones to be maintained around water bodies. All vandal covers to be removed by plant operator when working in vicinity of waterbodies.	Rare	Catastrophic	Low
		Worker injury or fatality whilst undertaking maintenance on plant	WINBMS-OP-03		Possible	Catastrophic	High 15	Any major repairs identified must be reported to the site supervisor and the workshop immediately and major service work or repairs must be performed by a competent person. Minor items of maintenance such as greasing, pre starts, fluid level checks, must be carried out daily by the plant operator Safe Operating Procedures must be available for review and approval for all planned and unplanned maintenance of all plant.	Unlikely	Catastrophic	Medium
Crane Works *State Health & Safety Act / Regulations (Plant & High-Risk Sections) *Safe Work Australia Model Code of Practice: Managing risks of Plant in the Workplace * AS 2550 Cranes Safe Use *AS /NZS 1418.1 Cranes, hoists & winches * AS 1353.2 Flat synthetic-webbing slings-care & use *AS 3775.2 Chain slings-care & use	Steep slopes, striking personnel/plant, load falling, striking overhead services.	Crane tipping	WINBMS-OP-09	Licensed Operator	Possible	Catastrophic	High 15	Crane permit to be used prior to set up. Licence operator to ensure crane is set level and stable. Load slung by licensed dogman. Load chart displayed in cabin. Pre starts checks to be completed to ensure all warning devices are working	Rare	Catastrophic	Low
		Sling break / fail	WINBMS-OP-09	Licensed dogman	Unlikely	Catastrophic	Medium 10	Competent person to inspect all slings and chains prior to use to ensure equipment are in good working order and correctly rated for items to be lifted. If chains or slings are damaged or do not have tags they are to be removed from circulation until retested and tagged by a NATA accredited tester	Rare	Catastrophic	Low
		Collision with person or plant	WINBMS-OP-09	Licensed Operator	Unlikely	Catastrophic	Medium 10	Crane lift site to be Cleary defined and barricaded where possible. All non-essential site personnel and plant to be kept clear of area. All personnel to where appropriate PPE when working with crane.	Rare	Catastrophic	Low

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Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
		Crane could strike overhead power	WINBMS-OP-09	Competent Electrical spotter	Possible	Catastrophic	High 15	No go zones to be maintained during lifts. Power to be isolated where possible. Competent electrical spotter used when required to work within spotter zone of power lines	Rare	Catastrophic	Low
Working at Heights *State Health & Safety Acts / Regulations * Safe work Australia National code of practice for the prevention of falls in the construction industry *Safe work Australia Model Code of Practice: Managing the risk of falls at the workplace *AS 1576.1 Scaffolding - General Requirements *AS/NZS 4576 Guidelines for Scaffolding *AS/NZS 1576.2 Metal Tube & Coupler Scaffolding *AS 1576.2 Couplers & Accessories *AS/NZS 1891.4 Industrial fall arrest Systems & Devices-Selection Use & Maintenance *AS/NZ 1891.3 Industrial Fall Arrest Systems & Devices - Fall Arrest Devices *AS/NZS 1891.1 Industrial fall arrest systems & devices - Harnesses & ancillary equipment *AS/NZS 1891.2 Industrial fall arrest systems & devices- Horizontal lifeline & Rail Systems	Falling / injury /death. Roofs, walls, excavations, penetrations	Personnel could fall whilst performing works at or above 2.0m the natural surface level	WINBMS-OP-04 WINBMS-OP-17	Working at Heights Training / Scaffold licence for scaffold over 4.0m	Possible	Catastrophic	High 15	Works to be performed at ground level where possible. EWP to be utilised where possible. Appropriate work platforms or scaffold to be provided. Appropriate harness and fall arrest system to be worn by personnel working at heights. SWMS developed & personnel signed on	Rare	Catastrophic	Low
		Personnel could fall whilst working close to an unprotected edge where there is a risk of a fall from one level to another	WINBMS-OP-04 WINBMS-OP-17	Working at Heights Training	Possible	Catastrophic	High 15	Edge protection must be provided in the form of guard rails of 900mm - 1m high with a mid-rail or workers must be separated from the edge with barricading by at least 2.0m or Appropriate harness and fall arrest system to be worn by personnel working at heights. SWMS developed & personnel signed on	Rare	Catastrophic	Low
		Personnel could fall whilst working on large batters	WINBMS-OP-04 WINBMS-OP-17		Possible	Major	Medium 12	Appropriate fall arrest systems to be used SWMS developed & personnel signed on	Rare	Major	Low
		Personnel could fall into open pits and shafts	WINBMS-OP-04 WINBMS-OP-17		Unlikely	Catastrophic	Medium 10	All pits and shafts to be kept covered or barricaded.	Rare	Catastrophic	Low
Working in or Near Pits *State Health & Safety Act / Regulations (Confined Space Section) *Safe work Australia Model Code of Practice - Confined Space *AS/NZS 2865 Confined Spaces	Restricted entry & exit, possible harmful atmosphere, falls, struck by plant and working unknown by other personnel and alone	Personnel could be overcome by harmful / explosive gases or low levels of oxygen	WINBMS-OP-07	Induction and training	Unlikely	Catastrophic	Medium 10	Risk Assessment have been carried out including atmospheric monitoring to determine if a storm water pit is a confined space. If a storm water pit has just been installed and we are in control of where a storm water line begins and terminates it is not to be a confined space. When we have to enter a storm water pit in an older area and has not been under Winslow controls a full risk assessment must be undertaken to determine if the pit is a confined space. HSE coordinator will assess pit and determine appropriate measures to be implemented. If pit is identified as a confined space an entry permit to be issued and only appropriately trained personnel may enter. Signs to be erected to clearly defined area as confined space. Emergency action plan to be developed and appropriate rescue equipment in place. SWMS developed & personnel signed on. Emergency Action Plans developed and understood by all on site.	Rare	Catastrophic	Low
		Personnel could be struck by plant or object working in pits unknown to other	WINBMS-OP-07 Site Works SWMS	Induction and training	Possible	Catastrophic	High 15	When working in a pit personnel must use a bollard or traffic cone to signify "worker below". Communicate with any plant that is working in the area and if plant work must continue another working location should be sort until plant works are completed. SWMS completed and signed by all personnel. Emergency Action Plans developed and understood by all on site.	Rare	Catastrophic	Low
		Personnel could slip and fall and not be discovered in pit.	WINBMS-OP-07 Site Works SWMS	Induction and training / SWMS	Possible	Catastrophic	High 15	Personnel must work in pairs when pit work is to be done. Personnel must work no further away than a connecting pit. Constant communication must be maintained, talk through pipes etc. When pits are over 2m in depth a "toppy" must be used, the pairs still working in connecting pipes must have a third person at ground level to reduce the number of times a person must climb in and out of the pit. When	Rare	Catastrophic	Low

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Activity	Hazards	Impact/Risk	IMS Procedures & Instructions	Competency Required	Likelihood	Consequence	Project Risk	Controls	Likelihood	Consequence	Secondary Risk
								climbing in climbing in and out of any pit three points of contact must be maintained on step irons and working buckets with tools should be lowered in by using rope etc. to allow hands to be free for climbing. SWMS completed and signed by all personnel. Emergency Action Plans developed and understood by all on site.			
		Personnel or other people could fall in open pits	WINBMS-OP-07 Site Works SWMS	Induction and training / SWMS	Possible	Major	Medium 12	Pits must be kept covered or barricaded when not being worked on	Rare	Major	Low

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Table: 1 RISK ASSESSMENT LIKLIHOOD

LIKELIHOOD		
SCORE	**DESCRIPTOR**	**LIKELIHOOD OF EVENT**
5	Almost Certain	Is expected to occur in most circumstances
4	Likely	Will probably occur in most circumstances
3	Possible	Might occur at some time
2	Unlikely	Could occur at some time
1	Rare	May occur only in exceptional circumstances

Table: 2 RISK ASSESSMENT CONSEQUENCE

CONSEQUENCE		
SCORE	**DESCRIPTOR**	**EXAMPLE OF CONSEQUENCE**
1	Insignificant	Activities do not cause any personal risk and will not result in injury
2	Minor	Activities may cause injuries or personal health problems requiring local first aid and no rehabilitation period
3	Moderate	Activities may cause injuries or health problems requiring medical attention and where short rehabilitation period is required
4	Major	Activities may cause serious injuries or health problems requiring hospitalisation and a significant period of rehabilitation before being able to recommence work
5	Catastrophic	Activities that could cause death or permanent disability prevent any return to work

Table: 3 RISK ASSESSMENT MATRIX

Likelihood	**Consequence**				
	Insignificant (1)	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Catastrophic (5)**
Almost Certain (5)	Low (5)	Medium (10)	High (15)	High (20)	High (25)
Likely (4)	Low (4)	Medium (8)	Medium (12)	High (16)	High (20)
Possible (3)	Low (3)	Medium (6)	Medium (9)	Medium (12)	High (15)
Unlikely (2)	Low (2)	Low (4)	Medium (6)	Medium (8)	Medium (10)
Rare (1)	Low (1)	Low (2)	Low (3)	Low (4)	Low (5)

Scores:
1-5 = LOW
6-14 = MEDIUM
15-25 = HIGH

Score	***Priority***	***Accountability***
Low	3	Project Supervisor
Medium	2	Project Manager
High	1	Construction Manager

RISK SCORE = Likelihood x Consequence

APPENDIX C

INCIDENT REPORTING & INVESTIGATION FORMS

EMERGENCY CONTACTS

PROJECT: Stg 2, Courtney Dr, Upper Coomera	
LOCATION: 97 Courtney Dr, Upper Coomera	
JOB No: 18545	**CUSTOMER:** HB QLD Pty Ltd

AMBULANCE:	**000**
FIRE BRIGADE:	**000**
POLICE:	**000**

FIRST AIDER:	Desmond Ramak	Mobile: 0437 928 665
DOCTOR:	Sonic HealthPlus Southport	Tel.No: (07)5552 0800
ADDRESS: 10-12-Younf Street Southport, QLD, 4215		
HOURS: Mon – Fri: 8.00am – 4.00pm		
HOSPITAL:	Gold Coast university Hospital	Tel.No: 1300 744 284
ADDRESS: 1 Hospital Blvd, Southport QLD, 4215		

TELEPHONE	TELSTRA	13 22 03
ELECTRICITY	ORIGIN	13 19 62
	ENERGEX	13 19 62
	ERGON	13 22 96
GAS	ENVESTRA	1800 808 526
	AGL ASSIST	1300 763 106

ENVIRONMENT	DEHP(Department of Environment & Heritage Protection)	13 74 68
SEWER & WATER	City of Gold Coast	07 5667 5801

WORK HEALTH & SAFETY: Department of Justice & Attorney General		1300 369 915
INCIDENT NOTIFICATION:		1300 369 915
POISON INFO'	INFORMATION Centre, BRISBANE	13 11 26

ENVIRONMENTAL INCIDENT REPORTING (WINBMS-EP-03)

1. PURPOSE & SCOPE

The purpose and scope of this procedure is to provide a uniform control mechanism when an emergency environmental incident occurs. It covers:

- Preparedness and training
- Managing the incident during and following the Emergency
- Incident Notification, investigation, reporting & recording

2. DEFINITIONS

Emergency: An Emergency is any incident that has caused or has the potential to cause a significant impact on the Environment.

Incident: Any occurrence that had the potential to impact on the environment during the course of the project works.

- Any occurrence that has disrupted the orderly conduct of work on site
- All emergencies are incidents.

3. PROCEDURE

3.1 Management Responsibilities

The Project Manager is responsible for

- Ensuring all employees have, the opportunity to be trained and be prepared in the event of an incident occurring.
- Preparation of Environmental Instructions or Procedures or a Environmental Management Plan if required
- Identifying environmental aspects and their impacts and assessing the risk level
- Ensuring that employees have access to appropriate PPE and resources applicable to the risk and activity to be carried out.
- Ensuring that Worksite inspections are carried out weekly as per procedure.
- Obtaining approvals from superintendent, client, authority or environmental regulatory body, where required.

3.2 Environmental Preparedness

Prior to commencing any project the Project Manager shall ensure that the project specific EMP/EMS is prepared and includes the following:

- Project specific Environmental Management Plan/Strategy
  Assessment of risks and development of work instructions for additional environmental Aspects and Impacts identified, Risk Register **(WINBMS-SP-05-A)**
- Details of the training in Emergency procedures that is to be carried out at the worksite induction during the duration of the project.
- Emergency numbers including that of the EPA or other Regulatory Authorities.
- Emergency assembly point in case of an emergency that requires an evacuation of the site.

Worksite Inductions should be held with all employees and subcontractors to explain & inform them of the following:

- The emergency numbers and their location
- Name of the site environmental officer
- Person responsible for calling for assistance
- Emergency Procedures Training

Employees should be trained so that they are familiar with all the environmental procedures and instructions. Where required, all relevant employees shall be trained in the environmental **GREEN CARD** requirements

Emergency Response Procedures should be tested periodically for its effectiveness and must ensure that all employees are familiar with them. This could be part of the Worksite Induction.

3.3 Prior to commencement on site

Hold a Worksite Induction and discuss environmental issues, procedures and instructions that control activities on site. Ensure that environmental control measures are in place and are adequate.

Conduct a toolbox meeting in the use of spill kits.

3.4 Managing the Incident

All incidents will be managed during their development through to the completion, when the situation is safe. Where the initial incident occurs on the Worksite, we shall manage the incident until emergency response professionals arrive at the Emergency location.

3.5 Procedure when there is an Environmental Breach or Incident

Notify the Project Manager or HSE Manager immediately and take all steps to minimise the damage and limit the impact (effect) of the breach.

If the breach is serious and additional resources other than what is available to us is required, then notify the local authorities and the EPA with the aim of getting specialist assistance quickly.

All Environmental Incidents which have caused (or have the potential to cause) an impact on the environment, shall be reported and investigated **(WINBMS-EP-03-A)** These Incidents include but are not limited to:

- Spillage or leakage of a hazardous substance or dangerous goods
- Contaminated material e.g. asbestos, prescribed waste
- Water contamination of a watercourse such as a creek, river, stream, etc
- Soil erosion and sedimentation
- Damage or destruction of an Archaeological / Heritage site
- Damage of destruction of specified or protected Flora and Fauna
- An explosion or fire.

3.6 Reporting and Investigation of an Environmental Breach

Immediately notify the superintendent/client of the breach and in case of Notifiable incidents, the EPA must be informed through an environmental report **(WINBMS-EP-03-A)**

Prepare a *Non Conformance Report* using **WINBMS-SP-16-A**

Investigate the breach and put in place corrective action to minimise the risk.

4.0 REFERENCES:

WINBMS-EP-03-A Environmental Incident Report

WINBMS-SP-16-A Non Conformance Report

INCIDENT / HAZARD REPORT

ADMINISTRATION			
Date:	Time:	Report By:	
Location:			Job No.
Winslow Division: ☐ Const ☐ Infra ☐ Maintenance		HSE Representative:	
Supervisor:		Operations Manager:	
Raised by: ☐ Winslow ☐ Client ☐ Subcontractor ☐ Authority / Stakeholder			

INCIDENT TYPE		
☐ INJURY TO PERSON(S)	☐ DAMAGE TO PROPERTY	☐ VEHICLE/PLANT/EQUIP INCIDENT
☐ NEAR MISS REPORT	☐ DAMAGE TO LIVE SERVICES	☐ QUALITY IMPROVEMENT
☐ HAZARD IDENTIFICATION	☐ DAMAGE TO ASSET	☐ ENVIRONMENTAL INCIDENT

REPORT DETAILS

NAME	COMPANY	PHONE	INJURED	WITNESS
			☐	☐
			☐	☐
			☐	☐

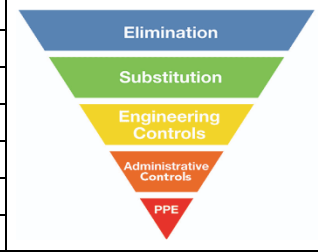
ASSET DETAILS	
WINSLOW VEHICLE:	3RD PARTY VEHICLE:
WINSLOW VEHICLE:	PLANT ID/NO.:

INCIDENT RATING			
☐ MINOR	☐ MODERATE	☐ SERIOUS	☐ SEVERE

(PLEASE SELECT THE RELEVANT INCIDENT CATEGORY FROM THE INCIDENT MATRIX)

TREATMENT TYPE					
☐ Hospital	☐ Doctor	☐ First Aid	☐ Repair	☐ Replace	☐ None

IMMEDIATE - CORRECTIVE ACTIONS

Details:		
		☐ Change Method or Task
		☐ Replace Equipment or Task
		☐ Install Safety Device / Guard
		☐ Change Process / Update SWMS
		☐ Toolbox / Retrain Staff
		☐ Raise NCR
		☐ Increase / Adapt PPE

LONG-TERM - PREVENTATIVE ACTIONS

Details:	HSE Coordinator:	
	Signature:	
	Date:	
	Operations Manager:	
	Signature	
	Date:	

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX D

COMMUNICATION & CONSULTATION FORMS

INDUCTION OF SITE PERSONNEL

NAME OF INDUCTEE:_____ Known Allergies:_____Emergency Contact Number: _____

Date Of Induction:_____CI Card No:_____Employer: _____

Operator Ticket: yes/no Type_____ Date of Issue:_____

- ☐ Name of Site Safety/First Aid Officer in case of Emergencies/Incidents.
- ☐ Location of First Aid Kits, Spill Kits, Fire Extinguishers, Health & Safety Co-ordination Plan.
- ☐ All Inductees and personnel are responsible for their own Health & Safety and the safety of others affected by their actions.
- ☐ Location of Emergency phone numbers & procedures/assembly area. Assemble at the emergency evacuation area and do not leave until directed to do so by a Winslow representative.
- ☐ All hazards, incidents and near misses must be reported to the Supervisor/Foreman immediately.
- ☐ All Site personnel are to wear long sleeve high visibility clothing/safety boots at all times. Hard hats are mandatory on all sites and hearing and hand/eye protection to be worn when required.
- ☐ Safe controls must be implemented while undertaking high risk construction work as detailed in NSW Work Health & Safety Act and Regs 2011 and you must ensure that appropriate permits are in place prior to undertaking any task that requires such permits. Safe Work Method Statement for all High-Risk Activities.
- ☐ Maintain good housekeeping on Site and dispose of waste material appropriately and as directed by Winslow.
- ☐ Entry and Exit requirements to Site are as directed and must be strictly complied with at all times.
- ☐ No mobile phone use near plant and no personal phone calls during work hours.
- ☐ Winslow Sites are Drug and Alcohol free. Smoking is strictly prohibited in enclosed places.
- ☐ Any form of Bullying or Harassment will not be tolerated and will be dealt with in accordance with Winslow's company policy
- ☐ Daily Plant prestart checklists to be completed prior to start and unsafe plant must be tagged out and not operated.
- ☐ All plant fitted with quick hitches; the **SAFETY PINS** must be fitted at all times during operation.
- ☐ Spotter must be present while operating under Over Head Power Lines and while excavating close to or over underground assets.
- ☐ All sub-contractors must provide copies of their Construction Induction Card, licences & plant risk assessments.
- ☐ Safety Data Sheets are kept in site office and must be reviewed when appropriate.
- ☐ Environmental requirements of the client and Winslow for water/air quality/erosion/sediment controls/vibration/noise pollution & testing methods must be met. Flora must be protected at all times.
- ☐ Do not handle contaminated soils without appropriate personal protective equipment. When asbestos is located on or near the Site (or suspected asbestos) it must be reported to the Foreman immediately and the area to be secured.
- ☐ Good community relations must be maintained at all times inclusive of acceptable behaviour on Site to the satisfaction of Winslow.
- ☐ Respect all archaeological/cultural/heritage values in accordance with law and any direction by Winslow.
- ☐ Comply with all Winslow's policies, procedures and High Risk COVID Safe Plan as advised by Winslow.

PUBLIC LIABILITY

- ☐ Noncompany issued vehicles must be parked off Site and Winslow does not accept any responsibility if damage occurs whilst personal vehicles are parked on Site.
- ☐ All persons entering the worksite must obey all directions by Winslow as to traffic management including movement of equipment and vehicles within or surrounding the Site.
- ☐ Under no circumstances be in, or park any vehicle near, the vicinity of operating plant or machinery except by express written direction from Winslow and must at all times give way to operating plant/machinery.
- ☐ Any person entering the Site does so entirely at his/her own risk and to the fullest extent permitted by law, Winslow, it's servants or agents, will not in any case be liable in tort, or in contact, or in any other way for any damage which occurs on the Site or as a result of the project to any property of any person who enters this Site howsoever that damage or liability may occur.
- ☐ All Winslow policies, including Quality Management, Occupational Health & Safety, Environmental Management, Bullying and Discrimination must be read and clearly understood by all employees, sub-Contractors, and visitors to the site.
- ☐ Everick Heritage – Cultural Heritage Induction, Deebing Heights – Yuggera Ugarapul People's Country

I_____(please sign) verify and agree that, prior to commencing work at the Site, I have received my induction and clearly understand all matters discussed and contained in the above documentation and will carry out any duties or obligations expressly or impliedly contained in the induction documents to the absolute satisfaction of Winslow.

Name of Inductor:_____(PLEASE PRINT)

Project/Location ("Site"): South Place Stage 1 & 2 – 152-280 Grampian Drive, Deebing Heights (PLEASE PRINT)

APPENDIX E

MONITORING FORMS

WEEKLY HSE INSPECTION CHECK SHEET

Project / Work Location: _____Project No. _____ Inspection Date: ___/____/_____

Inspection Participants: CCA WinslowRep/s_____

CCA Winslow Senior Management Representative_____

Contractor Rep/s (Name and Company) _____

Note: Copies of site inspection must be circulated to responsible persons for any rectifications required.

House Keeping / Emergency Equipment	OK ✓/✗	Description and Action Required	Person Responsible	Date Fixed
Are all areas clean, clear & free of slip / trip hazards				
Caps on Reinforcement bars and Star pickets				
Are all materials stored appropriately				
Are access ladders & stairs in good condition				
Is Waste Management Effective				
Site specific emergency preparedness plan in place				
Is installed fire equipment maintained				
Site first aiders known to employees				
First aid treatment being recorded				
Are first-aid kits available & maintained				
Personal Protective Equipment (PPE)	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Is safety foot wear worn by all				
Are hard hats being worn				
Is hearing protection used in noisy work areas				
Are respirators being worn where required				
Is approved eye protection being worn				
Is correct PPE available				
Plant Safety	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Is all moving machinery & nip points guarded / Quick Hitch Safety Pins in place and lock out devices OK				
Are all 2 way radios and flashing lights operational				
Reverse/travel beepers working and operational				
Have Plant Authorisations been completed for all CCA and hired / sub-contracted plant on site				
Where required, do operators hold appropriate competency and have VOC's been completed				
Have all operators signed onto the excavation permit				
All services identified and protected				
Plant clear of overhead powerlines and qualified spotter in place where required				
Electrical Safety	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Is electrical equipment tested, is it tagged (in date)				
Where required, are leads elevated or protected				
Is electrical equipment free of water and other hazards				
Excavations / Confined Spaces	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Is the required access/works permit held				
Are all openings barricaded or protected				
Are all excavations correctly benched/battered/shored				
Is access and egress provided				
Are Spoil heaps clear of excavation				
Has water been removed from the excavation				
Hazardous Materials	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Are all hazardous materials clearly labelled				
Are all Safety Data Sheets (SDS) available				

WEEKLY HSE INSPECTION CHECK SHEET

Is material stored in the correct location				
Working from Heights (if applicable)	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Are heights clear of power lines				
Are ladders tied off, angled correctly (1in 4) & extend 1m above landing.				
Are protections in place to protect from falling objects				
Work at heights equipment utilised correctly				
SWMS **In order to meet legislative compliance requirement activities on site should be checked against the applicable SWMS (e.g. on site tick and flick of one selected CCAW or sub-contractor SWMS per week)**	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Workers involved in SWMS development, are site specific				
Reviews carried out on all subbie SWMS's				
Are controls implemented, effective as per SWMS's				
Have all workers signed on to the relevant SWMS				
Attach <u>reviewed</u> SWMS to this checklist as evidence				
Environmental Controls	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Are dust control activities effective				
Are sedimentation controls effective in containing sediment on site and in good condition				
Is emergency spill kit on site				
Is the noise generated on site within acceptable limits				
Weed Species management in place				
Is the Fire Ants Management Plan being applied				
Is dewatering undertaken in an approved manner				
Are bins in place and regularly emptied				
Are public roads clear of mud and debris				
Are all cultural heritage requirements being adhered to (if applicable)				
General	**OK ✓/✗**	**Description and Action Required**	**Person Responsible**	**Date Fixed**
Are all required access & other permits held including high risk licences				
Safety signage and CCA Site signs in place				
Incidents and accidents being reported				
Lifting equipment in good order and tested and tagged				
Do on site amenities comply (i.e. toilet, site office/crib, water and hand washing facilities)				
Are all Project plans and documents up to date				
Have all been site inducted				
Are manual handling aids used where applicable				
OTHER Problems Found During Inspection	**Action Required**		**Person Responsible**	**Date Fixed**

WATER QUALITY REGISTER

WINBMS-ER-05

Project Name: **Job No:** **Contract No:**

DATE	LOCATION OF TEST	TURBIDITY	PH	SUS.SOLIDS	LITTER	OIL & GREASE	FLOW	ELECTRICAL	DISSOLVED	TOT.DISSOL	METERS
		30 NTU Med	6.5-9	<30MG/L %ile	Incl. Inert Waste	No Trace	No Adverse	CON'VITY	OXYGEN	SOLIDS	CALIBRATED
							Impact		<80%	<500MG/L	

Person performing tests

Print Name

Samples to be taken;

a) prior to comencement of works &
b) immediately after rainfall (>5mm in 24hrs) &
c) 2 weeks after last sample &
d) as directed by Superintendent

If turbidity exceeds 25 NTU and/or suspended solids exceed 30MG/L;

a) notify EPA & client within 2 hrs. &
b) take immediate action to reduce suspeneded solids & turbididty &
c) submit a proposal to ensure similar events do not recur.

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX F

COMPLIANCE & CONTINUAL IMPROVEMENT FORMS

ENVIRONMENTAL INCIDENT REPORT

Complete this page only if the incident was reported to the EPA (Environmental Protection Authority)

To be comleted by: the relevant Supervisor/Project Manager/Project Engineer

Was EPA Notified ☐ YES ☐ NO

Reported to the EPA by Name: Position:

Notification Method: ☐Phone ☐On Site

Date of Notification: Time: AM/PM

Any other authorities notified and why:

Name:	Position:
Signature:	Date:

Note: If the EPA was contacted, the incident report must be faxed to the GM/BUL immediately.

Legend: GM- General Manager, BUL- Business Unit Leader

NON-CONFORMANCE REPORT (WINBMS-SP-16-A)

Entity Issued to:		**NCR No**:
Project Name:		Date:
☐ Operational	☐ Procedural	☐ Material

NCR raised as a result of	☐ Inspection & Testing	☐ Co's NC Product
☐ Suppliers NC Product	☐ Customer Compliant	☐ Audit

Non-Conformance Details:	
Signature of Person Raising NCR:	Date:

Proposed Method of Disposition to Non - Conformance		
☐ Accept as it is	☐ Accept with Concession	☐ Rework or Repair
☐ Reject & Replace	☐ Return to Supplier	☐ Regrade for other use
Details:		
Company Approval Signature:		Date:

Customer/Client Approval:	☐ Required	☐ Not Required

Disposition Completed on:	Date:	Completed By:
Date Approved:	Date NCR Closed:	Closed By:

Corrective Action:	☐ Required	☐ Not Required
Preventive Action:	☐ Required	☐ Not Required

Details of CA/PA taken if required:

CA/PA Closed:	Date:	Closed By:

WINBMS-SP-16-B

NCR, Improvement & Suggestion Register

						CATEGORY													ROOT CAUSE								
Ref #	JOB NO	CATEGORY COST CODE	DATE OCCURRED	REPORTED BY	DETAILS OF NCR, IMPROVEMENT OR SUGGESTION	Quality	Safety	Environment	Damage/Property	Audit finding	Training	Suggestion	Complaint	Estimating	Rework/damage	Near Miss	Opportunity	COST OR PERCEIVED BENEFIT	KEY CAUSE/ ISSUE/ RESULT	Organisation	Resources	Training	Time	Discipline	Mang Support	Other	PREVENTATIVE/ BENEFITS OF ACTION. MIN 3 POINTS	COMMENTS

Winslow PROJECT AUDIT SCHEDULE

Audit No.	Department / Project To Be Audited	Frequency Per Month	Elements / Procedures To Be Audited	2022						2023											
				J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1	Quality		Project Quality Plan																		
2	Safety		Project Safety Plan																		
3	Environmental		Project Environmental Plan																		
	Onsite audits nust be performed in accordance with the Project																				
	Management Plans																				

NOTE: = planned audit ; = planned audit performed

HSE LEADERSHIP

WINSLOW

COMMITMENT BY EVERYONE EVERYWHERE EVERYDAY

WE SUCCEED AS ONE

	 Individual Leader	 Leaders	 Senior Leaders	 Executive Leaders
Standards	Follow standards and rules	Ensure compliance	Set high standards	Demonstrate commitment
Communication	Speak up	Encourage the team	Communicate openly	Motivates & encourages
Risk Management	Be mindful	Promote risk awareness	Confront risk	Commitment to risk reduction
Engagement	Get involved	Involve the team	Involve the workforce	Inspires with a compelling vision

SENIOR AND EXECUTIVE LEADER

Managers' Leadership Behaviours



People generally consider the attitude and behaviour of their manager's towards Health, Safety & Environment to be very important. Those managers who demonstrate their commitment to Health, Safety & Environment by applying their own knowledge and valuing the experience of their teams, including contractors, usually achieve good Health, Safety & Environment results.

Managers must elevate the message about Health, Safety & Environment to a strategic business priority and not permit HSE to be considered merely the job of a safety officer.

1. DELIVER HSE EXCELLENCE STANDARDS

To embed Health, Safety & Environment in our culture

I will ...	I will not ...
Hold others to account for their actions and regularly explain HSE expectations	React to circumstances, and not plan how to achieve desired Safety performance
Focus on sustainable performance improvements and measure progress via leading and lagging indicators	Delay following up on agreed HSE actions and provide feedback
Continually emphasise that our commitment to Safety will never be sacrificed in pursuit of achieving any other business targets or KPIs	Tolerate variable and inconsistent HSE standards
Consistently recognise good HSE behaviours and performance, and address poor HSE performance and unsafe behaviour when it happens	Allow short-term production pressures to win over HSE
Defend the rationale for Safety behaviours and challenge the business to consider breakthrough ways to improve HSE	Place undue emphasis on occupational safety, to the detriment of process safety

2. ENCOURAGE THE TEAM COMMUNICATION

To embed Health, Safety & Environment in our culture

I will ...	I will not ...
Talk face-to-face with my team about HSE performance and concerns	Ignore poor safety culture
Regularly vary communication methods to deliver the HSE message	Wait for others to communicate on HSE
Keep the HSE message simple and direct	Disregard team views about HSE
Provide prompt honest feedback on concerns raised	Fail to include HSE on the leadership meeting agenda
Be open and honest when mistakes are made	

3. CONFRONT RISK RISK MANAGEMENT

To embed Health, Safety & Environment in our culture

I will ...	I will not ...
Ensure effective mechanisms exist for people to raise HSE concerns	Fail to seek new ideas to support HSE performance improvement
Be approachable by any employee to discuss HSE concerns	Fail to provide a response or feedback to the team about HSE or welfare concerns raised
Actively encourage and support ideas to improve HSE performance	Show more concern about statistics, reputation and profile than caring for people
Review incidents and investigations to understand root causes and communicate learning	Fail to lead by example
Practice what I preach and be accountable for my actions	Blame others for my actions

4. INVOLVE THE WORKFORCE ENGAGEMENT

To embed Health, Safety & Environment in our culture

I will ...	I will not ...
Ensure adequate HSE resources and training are available; allocate sufficient time and priority for these initiatives	Unnecessarily delegate attendance at HSE meetings and personal involvement in HSE initiatives
Regularly discuss HSE performance during operational meetings and include sub-contractors in these meetings	Commit with words but do not take visible actions, or be slow to act
Take personal action to improve HSE performance by showing enthusiasm, decisiveness and support	Show negative interest, enthusiasm or support for HSE initiatives or issues
Continually seek new ways to widen team participation and involvement	Give a low priority to the development and maintenance of team HSE competence

PROJECT MANAGER / ENGINEER HSE LEADERSHIP AUDIT CHECKLIST

Audit Date:

Project Name:

Person Completing Audit:

Site Foreman:

PM / PE MUST COMPLETE ALL CRITERIA ON THIS FORM AND SPEAK TO AN OPERATOR, SUBCONTRACTOR OR LABOURER TO COMPLETE Sec 2 (HSE Leadership)

ALL PM / PE MUST COMPLETE A MINIMUM OF 2 AUDITS PER MONTH

ALL COMPLETED AUDITS ARE TO BE RETURNED TO THE HSE MANAGER TO BE ENTERED INTO THE DATA BASE

SITE FOREMAN MUST BE NOTIFIED OF ALL THE REQUIRED CORRECTIVE ACTIONS AND THEY MUST BE CLOSED OUT

Rating Scale:	**0**	**Unacceptable:**
	1	**Poor:**
	2	**Fair:**
	3	**Acceptable:**
	4	**Good:**
Based On:	**0**	**Potential for serious injury / major damage to equipment/Serious Non conformance to criteria**
	1	**Likelihood of an incident occurring**
	2	**General non compliance with legal and or site safety requirements**
	3	**Compliance substantial but not 100%**
	4	**All areas satisfy both legal and site safety requirements**
Not applicable	*	Not Applicable N/A

SECTION 1: SITE AUDIT	POSSIBLE	ACTUAL	%	OBSERVATION
1.1 GENERAL SITE				
a) Are all sharp objects capped? i.e.: star pickets, reo bars	4			
b) Winslow & Red Zone signs displayed at all entrances?	4			
c) First aid facilities clearly identified? (sign displayed)	4			
d) Site accommodation Access / Egress clear walkways around site sheds no trip hazards?	4			
e) Are all plant flashing lights and reversing beepers working?	4			
f) **ARE SAFETY PINS FITTED?**	4			
g) Are site amenities kept clean and tidy?	4			
h) Is the site adequately fenced as per client requirements? (fences in place & maintained, adequately braced, lockable gates etc)	4			
i) Are all pits adequately covered or barricaded?	4			
j) **Public Interaction**: Are pedestrian paths clear & are public interaction areas maintained in a safe manner?	4			
k) Are environmental controls in place as per EMP and are controls working? i.e. Dust suppressed, mud on roads, no escape of turbid waters	4			
Total Possible Score	**44**			
1.2 EXCAVATION WORK	**POSSIBLE**	**ACTUAL**	**%**	**OBSERVATION**
a) Are all excavations greater than 1.5m in depth battered, benched or shielded?	4			
b) Are all excavations, pits and unsafe areas adequately barricaded?.	4			
c) Is the Winslow Services Permit available on site?	4			
d) Have all relevant personnel signed on to the permit?	4			
e) Is Winslow Asset Protection Plan (APP) on site, displayed & as builts added?	4			
f) Have all known services been located, proved & protected?	4			
g) Are ***ALL*** overhead services adequately protected with signage, barricades and crossing points installed?	4			
g) Are any machines working in the vicinity of overhead or underground assets? Is a spotter available?	4			
h) Are service authority permits required for the work being undertaken & are they available?	4			
Total Possible Score	**36**			

SECTION 2: EMPLOYEE / OPERATOR / SUB-CONTRACTOR INTERVIEW	POSSIBLE	ACTUAL	%	OBSERVATION
NAME OF PERSON INTERVIEWED:..... **ROLE:**.....				
a) Has worker been inducted? (Check Induction Records)	4			
b) Has worker been signed on to ***task specific*** SWMS?	4			
c) Does the worker understand the risks and controls identified in the SWMS? (Check work against SWMS)	4			
d) Has the plant daily pre-start checklist been completed?	4			
e) Does the worker have a whitecard?	4			
f) Do operators have correct competency tickets?	4			
g) Does plant operator know production target for the activity being undertaken?	4			
h) Is there a KPI measurement being recorded for the major activity undertaken on site?	4			
i) Does the foreman or leading hand know the KPI target for their next planned construction activity?	4			
Total Possible Score	**36**			

SECTION 3: ADMINISTRATION	POSSIBLE	ACTUAL	%	OBSERVATION
a) Is there a copy of the ***site specific*** PMP on site?	4			
b) Is the ***site specific*** Health & Safety Coordination Plan and Hazard Register available on site?	4			
c) Are emergency numbers displayed and are they ***relevant*** to the site?	4			
d) Have ***weekly*** safety & environmental checklists been completed?	4			
e) Is TMP available on site?	4			
f) Does the TMP allow for pedestrian access / movements & is it adequate?	4			
g) Are TMP controls in place & have traffic checklists been completed?	4			
h) Are sub contractors working in accordance with SWMS and are personnel signed on to the SWMS?	4			
i) Are company policies and all relevant paperwork displayed in lunchrooms?	4			
j) Are operations adequately seperated and 30m red zones being adhered to?	4			
Total Possible Score	**40**			

CORRECTIVE ACTIONS			
Corrective Actions Required	**Who is responsible for close out?**	**Date of close out**	**Comments**

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX G

ENVIRONMENTAL CONTROL PLAN

enviro consulting

Erosion & Sediment Control Plan

Courtney Drive Estate – Stage 1-3, Upper Coomera

Progressive Erosion and Sediment Control Plan – Earthworks 002

Revision No	Date	Prepared by	Reviewed By	Approval
0	16/10/2023	Alisha Croft	Michael Williams	Alisha Croft CPESC #9428

CPESC	*Alisha Croft*	*0419 674 283*
Senior Project Manager	*Michael Williams*	*0472 723 733*

Alisha Croft #9428

1. SCOPE

This Progressive Erosion and Sediment Control Plan (ESCP) has been developed for the Earthworks phase for the Courtney Drive residential estate for Stage 1-3, Upper Coomera QLD. With additional progressive erosion and sediment control plans to be prepared for the Civil stages.

1.1 Guidelines

This ESCP has been prepared in accordance with the following document(s):

- Best Practice Erosion and Sediment Control (IECA, 2008)

1.2 Certification

This ESCP will be reviewed and certified by a CPESC prior to commencement of works. This review and certification will ensure the plan has been prepared to satisfy the intent and minimum standards nominated within the IECA (2008) Best Practice Erosion and Sediment Control Guideline.

2. PROJECT DESCRIPTION

2.1 Location & Land use

The site is located off Courtney Drive in Upper Coomera and will connect Courtney Drive with Rangeview Road. (**Figure 1**).

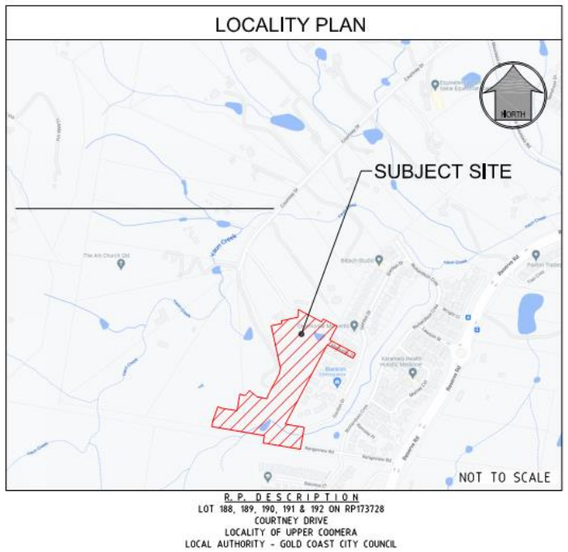


Figure 1: Locality Plan

2.1.1 Scope of Works

The scope of works is as follows:

- Site clearing and grubbing, inclusive of the removal of existing site trees;
- Undertake bulk earthworks activities;
- Construction of proposed lots and establishment of retaining between lots in accordance with design;
- Construction of stormwater infrastructure;
- Construction of proposed residential streets
- Installation of all relevant signage and line marking;

The general arrangement of Erosion and Sediment Controls are illustrated in **figure 2**.

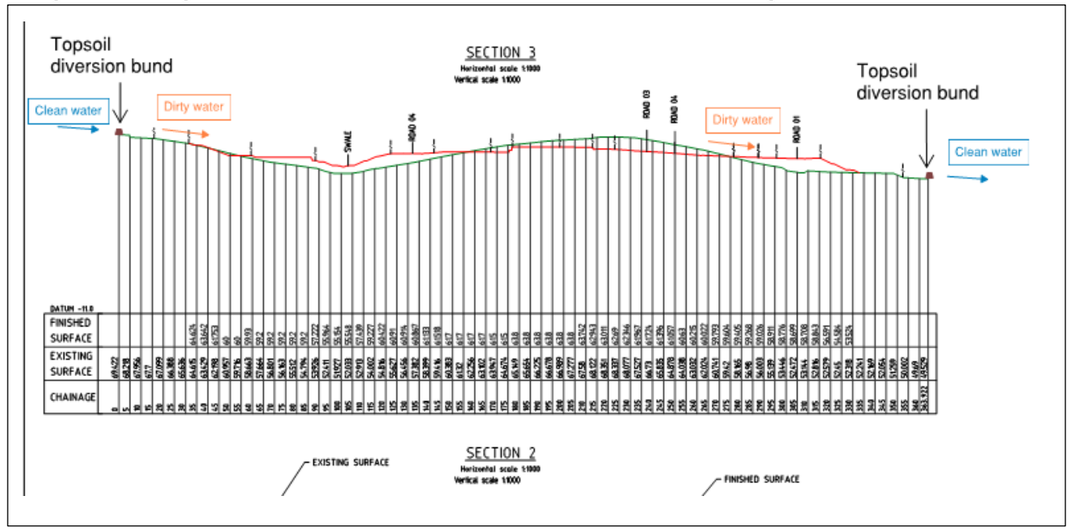


Figure 2: Typical Erosion and sediment control arrangement

3. SITE DESCRIPTION

3.1 Climate & Rainfall risk

Historic rainfall data for Upper Coomera has been extracted from the Coomera Foxwell Road Weather Station (Station No. 40516) the closest long-term gauging station to the site, is illustrated in **Figure 3**. Relatively wetter conditions typically occur from November to June and drier conditions tend to persist from July to October. The corresponding Erosion Risk Rating (rainfall depth) is colour coded from **Table 1** (Based on IECA Table 4.4.2).

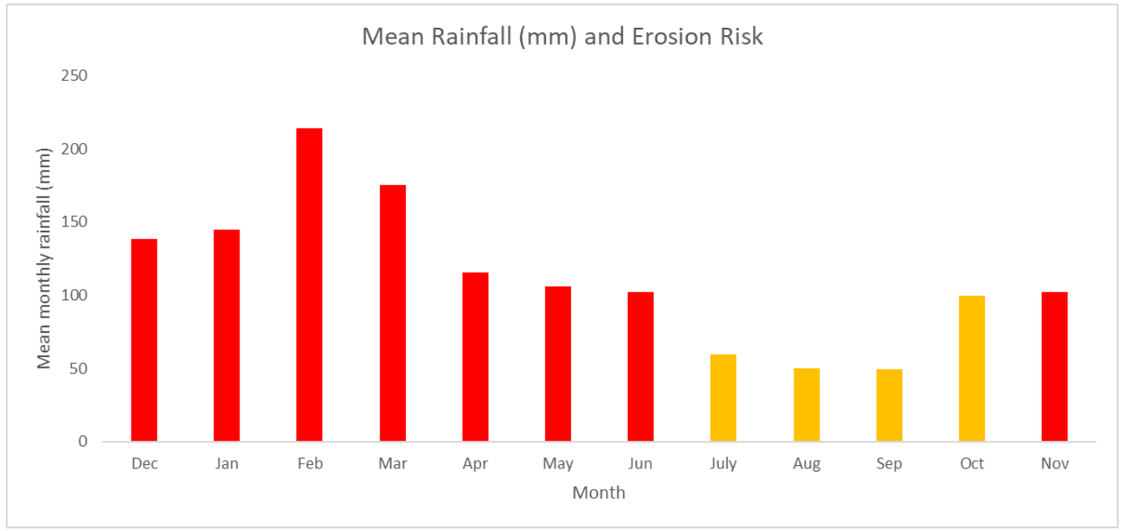


Figure 3: Mean Rainfall data, Coomera Foxwell Road Alert Weather Station #40516 (1997-2023)

Table 1: ***Erosion Risk Rating Categories (rainfall depth) as per Table 4.4.2, IECA, 2008***

Erosion Risk Rating	Average Monthly rainfall depth (mm)
Very Low	0 to 30
Low	30+ to 45
Moderate	45+ to 100
High	100+ to 225
Extreme	>225

3.2 Topography and drainage

Based on contours presented on the IFC Drawings and the Geotechnical report prepared by Pacific Geotech in January 2023, 'the site topography typically comprises a ridge line which meanders in a north south lineation through the centre of the site. The ridge line typically comprises flat or gentle sloping terrain of less than 5° in slope gradient. This ridge line is flanked to the east and west by mild sloping terrain typically ranging between 5° and 15° in slope gradient with some localised steeper areas ranging up to approximately 20° in slope gradient.' (*Geotechnical Investigation and Landslide Risk Assessment for proposed residential subdivision, end of Courtney Drive, Upper Coomera, January 2023, Pacific Geotech*)

Numerous drainage lines are currently present across the site, with the main drainage line traversing from the South western corner towards the north, a wide drainage area discharges to the west and another drainage feature discharges to the north. Each drainage line moves through an existing dam within the confines of the site prior to discharging offsite. The project shall utilize these existing dams as part of the clearing and grubbing phase of the project until the final sediment basins can be established for utilization during earthwork stages.

3.3 Soils

Soils located onsite consist of high plasticity clay soils or clayey sands.

4. RISK ASSESSMENT

4.1 IECA Soil loss assessment

Based on the requirements of IECA (2008), an erosion risk assessment has been conducted using the Revised Universal Soil Loss Equation (RUSLE). The calculated soil loss is then used to determine the level of sediment control required.

$$A = K \times R \times LS \times P \times C$$ Equation 1 (IECA 2008)

Where:

A is the predicted soil loss (t/Ha/yr)
K is the soil erodibility factor
R is the rainfall erosivity factor
LS is the slope length/gradient factor
P is the erosion control practice factor
C is the ground cover and management factor

4.1.1 K - Factor - Soils

Soils located onsite consist of Sandy Clay/ Clay present in area. As such a conservative assumption has been made for the K factor resulting in an adopted K factor of 0.051.

4.1.2 R - Factor - Rainfall

An annual erosivity factor of 5489 has been adopted based on a 2-year, 6-hour rainfall intensity of 15.6mm/hr and the following equation from section E3.2 of IECA (2008).

R = 164.74 (1.1177)S S0.6444

4.1.3 LS – Slope Length

As described in Section 3.2, the topography of the site comprises of moderate slopes. Based on existing/design surface levels, LS factors have been adopted as follows:

- Grades up to 8.75%, slope length will be limited to 25m between checks – adopted LS-factor 2.05
- Grades up to 10.62%, slope length will be limited to 25m between checks – adopted LS-factor 2.81
- Grades up to 16.87%, slope length will be limited to 10m between checks – adopted LS-factor 5.52

4.1.4 Cover (C) and Practice (P) Factors

A C factor of 1 has been adopted in accordance with industry practice to reflect the worst-case level of cover offered during the proposed development activities.

The P factor represents the combined effect of management practices and structural methods to control erosion. An industry default P factor value of 1.3 has been applied to the risk assessment, which is recommended for the construction phase condition (per table E11 of IECA, 2008).

4.1.5 Estimated Soil Loss

Results of the erosion risk assessment are presented in **Table 2**. Sediment control type derived from IECA (2008) Table 4.5.1

Table 2: Estimated soil loss from each site catchment

Site	Disturbed Area (HA)	R	K	LS	P	C	A (t/ha/yr)	Adopted Control	Comment
Catchment 1	4.36	5489	0.05	1.47	1.3	1	535	Type 1	Check dam spacing at 25m; excavated sediment traps at outlet/discharge locations; and C-factor reduction during months when soil loss exceeds 12.5t/ha/month i.e. from December to March. Note: C-factor reduction can be achieved in a number of ways including application of soilbinder and revegetation treatments
Catchment 2	2.91	5489	0.05	2.05	1.3	1	746	Type 1	
Catchment 3	5.4	5489	0.05	2.05	1.3	1	746	Type 1	

Due to an estimated soil loss of a maximum of 746t/ha/yr based on the construction stage of the proposed works and maximum area proposed for disturbance associated with the project, the Erosion risk is nominated as High in accordance with Table 4.4.3 of IECA (**Table 2**). Erosion and sediment control will be installed for the project in accordance with the risk profile and specific constraints of the site (Table 4).

Table 4: Erosion risk rating based on estimated soil loss rate (as per Table 4.4.3 IECA 2008)

Erosion Risk Rating*	Soil loss (t/ha/yr)
Very Low	0 to 150
Low	150+ to 225
Moderate	225+ to 500
High	500+ to 1500
Extreme	>1500

Table 5: Erosion Control Standards

Erosion Risk as per Table 4.4.7 of IECA	Limit of forward Clearing	Stabilisation – Temporary	Stabilisation – Permanent
All	All reasonable and practicable steps taken to apply best practice erosion control measures to completed earth works, or otherwise stabilise such works, prior to anticipated rainfall-including existing unstable, undisturbed, soil surfaces under the management or control of the building/construction works.		
Low	Clearing and stripping is limited to 8 weeks prior to the scheduled commencement of bulk earthworks	Unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 30 days	Disturbed soil surfaces are stabilised with a minimum 70% cover within 30 days of the completion of works within any area of a work site.
Moderate	Clearing and stripping is limited to 6 weeks prior to the scheduled commencement of bulk earthworks	Unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 20 days.	Disturbed soil surfaces are stabilised with a minimum 70% cover within 20 days of the completion of works within any area of a work site.
High	Clearing and stripping is limited to 4 weeks prior to the scheduled commencement of bulk earthworks	Soil Stockpile & unfinished earthworks are suitably stabilised if rainfall is reasonably possible, and disturbance is expected to be suspended for a period exceeding 10 days.	Disturbed soil surfaces are stabilised with a minimum 75% cover within 10 days of the completion of works within any area of a work site

5. GENERAL NOTES

- This Erosion and Sediment Control Plan (ESCP) has been prepared to provide a site specific ESCP to demonstrate the management of erosion and sediment control in accordance with the Best Practice Erosion and Sediment Control Guidelines (IECA, 2008).
- This ESCP shall be supplemented by Progressive Erosion and Sediment Control Plans (PESCP). PESCPs are to be developed to identify the specific location and, where required, additional erosion and sediment controls applicable to individual work stages. PESCPs shall be documented via mark ups to approved plans. Where a change in the level of sediment control standard is proposed in a PESCP, the PESCP shall be reviewed and approved by an appropriately qualified person prior to the change being implemented.
- Minimise the extent and duration of disturbance, maintaining existing ground cover to the greatest extent possible.
- Commissioning / decommissioning of plant and refuelling to be undertaken a minimum of 30m away from any watercourse/drainage line.
- All ERSED controls to be inspected regularly (weekly, pre/post rainfall event i.e. forecast or actual rainfall of >10mm) with maintenance/repairs to be undertaken when necessary
- Revegetation of disturbed/bare areas to be progressively implemented
- Where clean water drains and sediment traps/sumps are necessary, all clean water drains, and sediment traps and associated drainage must be installed and commissioned prior to the commencement of any grubbing works within the catchment area
- All controls must be installed within approved project footprint.
- Ensure all site access is stabilised with rumble grid and clean rock.

6. STAGING

Stage 1 - Vegetation removal, clear and grub, topsoil strip	Phase 1: • Site Establishment of access tracks, clearing and minor topsoil strip in locations for clean water drains only, installation of clean water drains, diversion bunds, clean water diversion drains, sediment basins and traps and other appropriate erosion and sediment controls. Temporary crossings are also to be installed where necessary with clean water diversion drains. Phase 2: • Clearing and grubbing to commence on approval from Project Environmental Site Representative of all clean water drains, sediment traps/basins and establishment controls installed appropriately. Clearing to commence in a sequential approach. Clearing activities will only remove large vegetation and retain groundcover wherever possible. • Vegetation will be stockpiled downslope of cleared zone and accessible from access track in readiness for mulching. Phase 3: • Mulching of stockpiled vegetation and stockpiling of mulch or integration into erosion and sediment controls. Phase 4:

	• Topsoil strip to commence in a staged approach across site and topsoil placed in designated topsoil stockpile areas with controls installed and maintained.
Stage 2 – Bulk Earthworks	Phase 1: • Cut and fill will continue through footprint, establishing supplementary controls as required (locations tbd onsite) such as mulch bunds and sediment fence or geofabric overplaced and wrapped up to act as filter fence at base of fill zones and around drainage inlet locations. Stabilisation to occur on cut/fill batters throughout works. Areas to be progressively revegetated as they are completed. Phase 2: • Civil works to commence, ensuring all site dirty water is directed into site sediment basins.
Stage 3 – Stabilisation/ Revegetation	• Site wide stabilisation and revegetation via seeding of any areas not already revegetated as part of progressive stabilisation works. Site must achieve 70% vegetated cover for works to be considered effectively stabilised.

7. DEWATERING AND WATER QUALITY

- Basins to be dewatered prior to rain event that is likely to produce runoff; however, during dry conditions water may be retained in the settling pond as a source of construction water (i.e. dust suppression).
- If possible, it is recommended that dewatering/spread of collected runoff from basins be applied to well vegetated lands at least 40m away from any waterway to allow it to infiltrate within the site boundary, if this is done, ensure water is applied slowly and in a manner that avoids concentrated surface runoff and/or erosion.
- If actively discharging (pumping or siphoning) the water out of the basin, water must be treated to achieve, pH 6.5-8.5, <10mg/L oil and grease and no visible trace and a standard 90%ile total suspended solids concentration not exceeding 50mg/L or 50%ile NTU reading (as per IECA Best Practice Erosion and Sediment Control Guidelines Appendix B) and no more than a 10% increase in background conditions.
- Where captured basin water is to be used onsite for dust suppression or construction purposed, water does not require testing or treatment.

8. DESILTING

- Install an appropriate painted desilting marker in the basin to indicate top of sediment storage zone. Basin must be desilted if the next storm event is likely to cause sediment to rise above this marker point; or if sediment is already above the marker; or if the sediment has exceeded 90% of the nominated sediment storage volume.
- Removal of all sediment/materials collected from the basin to be disposed of in a suitable manner that will not cause an erosion or pollution/environmental hazard.
- Refer to ESCP for recommended volume and dimensions for proposed sediment basin. Note that all dimensions are approximate and subject to verification with review of detailed ground survey and alignment.
- All earthen embankments (for basins or otherwise) greater than 1m in height to be certified by a qualified geotechnical specialist to ensure structural integrity for the desired design criteria and anticipated period of operation
- Upon decommissioning of sediment basins, all water contained within must be removed and disposed of appropriately before the removal of any basin embankments

9. OVERVIEW OF KEY ESC TECHNIQUES

Drainage Controls – Catch Drains (CD) and Diversion Banks (DB)

This ESCP identifies the location of catch drains and diversion banks required to divert upslope clean water away from areas of soil disturbance, stockpiles and excavations, and to collect dirty runoff water from disturbed areas and stockpiles and direct it to a sediment trap and to control water flow through the worksite to avoid damage to unfinished areas of earthworks and infrastructure. Due to the presence of potentially dispersive subsoils on the site, diversion banks have been used wherever possible. Diversion banks, when constructed by pushing soil from the down-slope side, avoid exposing sodic subsoils and maintain in-situ groundcover in the flow path.

Where site mulch is available in sufficient quantities, temporary diversion banks/sediment filters may be formed from mulch. Temporary sandbag diversion banks will also be used to provide temporary diversion of water in locations of limited space and active construction areas prior to forecast wet weather.

Erosion Controls – Soil Binders

Soil binders are a form of chemical surface stabiliser and/or soil-bonding agent applied to exposed soil surfaces to control erosion. Soil binders are suitable for minor drainage lines, upper waterway banks, batters and topsoil stockpiles. Soil binders have been specified for use on batter locations and drainage lines in the project area, to provide temporary erosion control during construction activities and reduce predicted soil loss and associated requirements for sediment controls.

Soilbinders (or revegetation treatments) are required to be applied to disturbed batters between the months of December to March to reduce C-factor prior to rainfall forecast >10mm in 24 hours.

Sediment Controls

The following key sediment controls are specified in this plan and have been applied to individual catchments based on the results of the RUSLE soil loss predictions (Section 3.5).

Sediment basins – Due to the size and slopes present onsite, Type B sediment basins have been nominated to capture and treat site runoff in applicable catchments.

Rock Checks/Filter Dam (Type 2) – Where drainage topography allows, rock checks and rock filter dams have been utilised to slow the velocities of site dirty water.

Sediment Fence (Type 3) - Sediment fences have been nominated to provide sediment controls in locations that are likely to receive predominantly sheet flows. Used in conjunction with concentrated flow sediment treatment techniques. Where site mulch is available in sufficient quantities, Type 3/perimeter controls may be formed from mulch.

Site Exit / Entry - To prevent sediment tracking onto public roads, stabilised rock pad entry locations have been identified. Associated drainage and sediment controls have been identified to contain and treat runoff in accordance with the adopted sediment control standard for individual catchments. Adjacent roads should be inspected regularly, and any sediment deposited on public roads should be removed in a safe manner and disposed of to an approved disposal facility

Mulch berms and bunds – site won mulch berms and bunds have been nominated across the slopes and perimeter of the project to slow sheet flows and velocity of dirty water down slopes.

10. STOCKPILE MANAGEMENT

Place stripped soil at approved stockpile locations

Stockpile topsoil at a height no greater than 2m.

Stockpile any excess subsoil or spoil separately from topsoils and at designated stockpile locations upslope of sediment traps.

Install non-woven sediment fence (bidim A34 or equiv) around stockpiles as per SD-FF-1

Where topsoil stockpiles will remain undisturbed for greater than nominated erosion standard, apply seeding of a cover crop at the rate of 10kg/ha to topsoil stockpiles. Refer to revegetation specifications for seed mix.

Where subsoil / spoil stockpiles will remain undisturbed for greater then nominated erosion standard, apply temporary cover or soil binder.

Temporary Stabilisation Erosion Standard

Month	Temporary Stabilisation Erosion Standard
Dec, Jan, Feb	10 days
Mar – Jun, Oct – Nov	20 days
July – Sept	30 days

11. INSPECTIONS & MONITORING

All erosion and sediment control measures, including drainage measures, must be always maintained and in proper working order during their operational life.

All drainage, erosion and sediment controls shall be inspected daily when rain is occurring (if site access is available) weekly, prior to and following a rainfall event of sufficient intensity and duration to cause on-site runoff immediately prior to and following periods of site shutdown.

Inspections shall include checks of all drainage, erosion and sediment control measures including site discharge points for:

- evidence of excessive sediment transport and or deposition either on or off site
- evidence of excessive erosion either on site or immediately downstream
- treatment and de-watering requirements for sediment basins / sediment traps
- the progress and stability of site rehabilitation and revegetation works.

Where inspections identify a non-conforming control measure, or issues that are likely to prevent the achievement of the erosion and sediment control objectives, corrective or preventative actions will be developed and implemented as necessary to achieve the required erosion and sediment control performance standards.

A written record / register of monitoring observations and maintenance tasks shall be kept on site and available for inspection.

12. SITE REHABILITATION

The following site rehabilitation requirements are to be read in conjunction with the project specific landscaping, soil management and revegetation plans and applicable project requirements. Where there is an inconsistency between the site rehabilitation measures in this document, and the project specific contract documents, the site specific and contract documents shall prevail.

Disturbed areas shall be stabilised within the following time frames

Permanent Stabilisation Erosion Standard

Month	Temporary Stabilisation Erosion Standard
Dec, Jan, Feb	10 days
Mar – Jun, Oct – Nov	20 days
July – Sept	30 days

Areas shall be considered stable once they achieve 70% cover in 90% of the relevant catchment. Temporary drainage, erosion and sediment control structures shall not be decommissioned until this level of cover is achieved within the upslope catchment.

Compacted areas / areas subject to construction traffic shall be first scarified to a minimum depth of 50mm to address compaction from construction traffic and assist in tying in topsoil. On steeper slopes (<3H:1V) scarification may alternatively be undertaken via track walking up and down the slope.

Stripped topsoil shall be reinstated in accordance with pre-stripping profiles and depths. Topsoil shall be placed at a minimum of 75mm and lightly compacted, reinstating the original top 50mm as the final layer. On slopes steeper than 4H:1V topsoil reinstatement shall be reduced to 50mm to minimise slumping.

Ensure all dispersive / sodic subsoil is adequately covered with a minimum of 50mm of non-dispersive topsoil.

Apply seed, fertiliser and hydromulch to disturbed areas as per rehabilitation specifications.

Apply follow up watering on a daily basis (subject to weather conditions) to hydromulched areas.

Any excess spoil shall be removed from the site to an approved disposal location and the stockpile location rehabilitated as per other disturbed areas

Seed Mix

Where a site-specific seed mix is not specified, the below table provides a seed mix suitable for use in site rehabilitation or temporary seeding.

Seed Mix Specifications

	Summer Blend (Nov – Feb)	Mid-Season (Mar/Apr & Sep/Oct)	Winter Blend (May – Aug)
Unhulled green couch (Cynodon dactalyon)	**35kg/ha**	**35 kg/ha**	**35 kg/ha**
Hulled green couch (Cynodon dactalyon)	**35 kg/ha**	**35 kg/ha**	**35 kg/ha**
Japanese or Shirohie Millet	**30 kg/ha**	**15 kg/ha**	**0**
Perennial Rye Grass	**0**	**15 kg/ha**	**30 kg/ha**

Hydromulch Specifications

Paper pulp at 2t/ha or wood pulp at 2.5t/ha plus tackifier at 5 to 10% by weight.

Appendix A : Progressive Erosion and Sediment Control Drawings

LEGEND

Stabilised exit

Mulch bund

Sediment Basin

Sediment trap

Dirty water drain

Dirty water flow direction

Sediment fence

Rock Checks

Install rock checks down access track every 25m and trafficable rollover bunds at 50m intervals to divert water into site controls

Sediment trap 1
Dimensions -
10m(L) x 5m(W) x 0.6m(D)

Install rock checks in dirty water drain

Install perimeter controls around topsoil and mulch stockpile site - sediment fence and mulch bund.

Sediment trap 2
Dimensions -
10m(L) x 8m(W) x 1m(D)

Install rock checks in dirty water drain

Utilise site-won mulch as mulch bunds around perimeter across slopes onsite

Basin 3
Minimum capacity 2660m3
Spillway: 12m wide - lined with geofab and d50 300mm rock

Catchment 3

Catchment 1

Catchment 2

Sediment trap 5
Dimensions -
10m(L) x 6m(W) x 1m(D)

Basin 1
Minimum capacity 2030m3
Spillway: 11m wide - lined with geofab and d50 300mm rock

Install rock checks in dirty water drain

Sediment trap 3
Dimensions -
10m(L) x 10m(W) x 1.5m(D)

Install rock checks in dirty water drain

Install sediment fence on completion of cut of batter

Progressively stabilise batters across site or utilise soil binder prior to forecast wet weather

Basin 2
Minimum capacity 1433m3
Spillway: 10m wide - lined with geofab and d50 300mm rock

Sediment trap 4
Dimensions -
10m(L) x 6m(W) x 1m(D)

LEGEND

EXISTING KERB (INVERT)
EXISTING PROPERTY LINE
EXISTING CONTOURS
FUTURE KERB (INVERT)
FUTURE PROPERTY LINE
PROPOSED KERB (INVERT)
PROPOSED PROPERTY LINE
PROPOSED RETAINING WALL
DESIGN CONTOURS
SITE BOUNDARY
STAGE BOUNDARY

NORTH

0 15 30 45 60 75m
Scale 1:1500 - A1 (1:3000 - A3)

PROJECT NAME

COURTNEY DR UPPER COOMERA

STAGE 01

RP DESCRIPTION

LOT 188, 189, 190, 191 & 192 ON RP173728
COURTNEY DRIVE
LOCALITY OF UPPER COOMERA
LOCAL AUTHORITY - GOLD COAST CITY COUNCIL

CLIENT

HB Land

REV	DATE	DESCRIPTION	INT
B	14-07-23	RFI AMENDMENTS	EP
A	03-03-23	COUNCIL ISSUE	JB

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APPROVED		RPEQ 4706	DATE 03-03-23

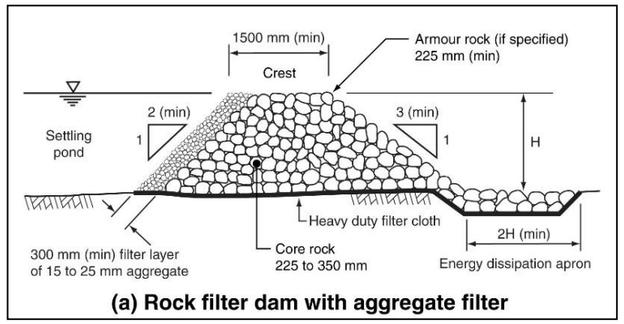
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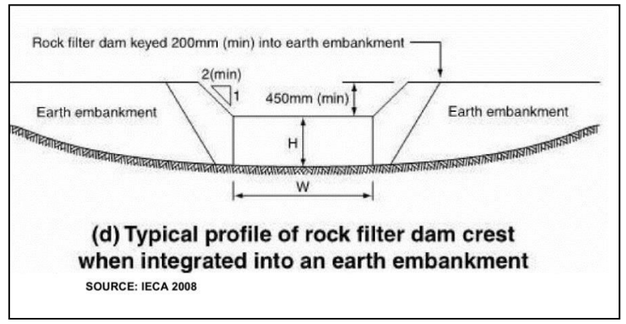
Appendix B : Standard Drawings and Calculations

Excavated Sediment Trap Calculator

Excavated Sediment Trap Calculator									
Chainage		Size only	Size only	Size only	Size only	Size only	Size only	Size only	Size only
Control design life	time	5	5	5	5	5	5	5	5
Max catchment size	m2	20000	15000	10000	7500	5000	2500	1000	500
ToC	Minutes	10.0	9.0	8.0	7.0	6.0	5.0	3.0	3.0
Rainfall	mm/h	143.0	148.0	154.0	161.0	168.0	176.0	194.0	194.0
Runoff	coefficient	1	1	1	1	1	1	1	1
Rational Method	m3/s	0.794	0.617	0.428	0.335	0.233	0.122	0.054	0.027
Particle Size targetted	lookup	0.100	0.100	0.100	0.100	0.100	0.150	0.150	0.15
Surface area	m2/m3/s	**111**	**86**	**60**	**47**	**33**	**8**	**3**	**2**
Volume at 0.6m		67	52	36	28	20	5	2	1



(a) Rock filter dam with aggregate filter

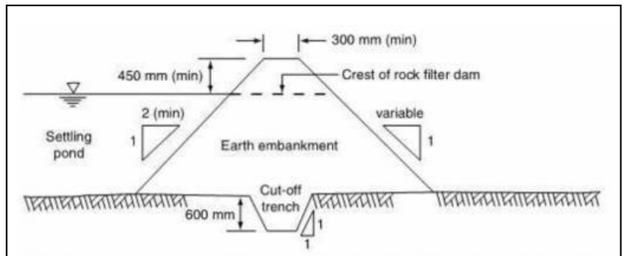


(d) Typical profile of rock filter dam crest when integrated into an earth embankment

SOURCE: IECA 2008

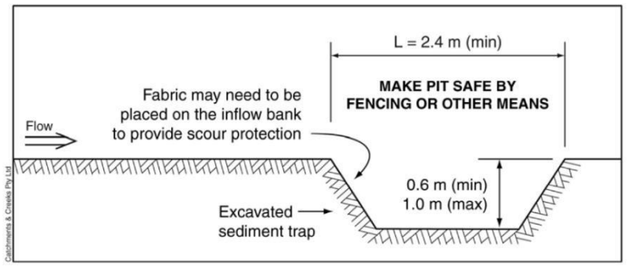
Design standard	Critical sediment size (mm)	Surface area of settling pond per unit discharge ($m^2/m^3/s$) [1]			Allowable through-velocity (m/s)
		10° C [2]	15° C [2]	20° C [2]	
Type 3 sediment trap	0.50	6	5.2	4.6	0.3
	0.20	38	33	29	0.3
	0.15	67	60	52	0.3
Type 2 sediment trap	0.10	150	130	115	0.2
	0.05	600	525	460	0.2
Type 1 sediment trap	0.04	940	820	720	0.2
	0.02	3700	3230	2860	0.2

[1] Pond area is based on a rectangular pond operating with uniform inflow conditions across its width.
[2] Assume a pond temperature the same as the typical rainwater temperature during the time of year when the pond is likely to be operating at capacity.



(c) Typical cross-section of constructed earth abutment

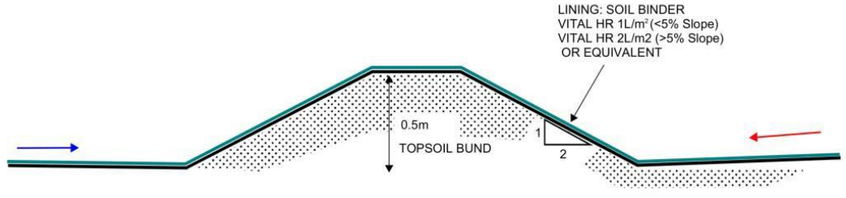
SOURCE: IECA 2008

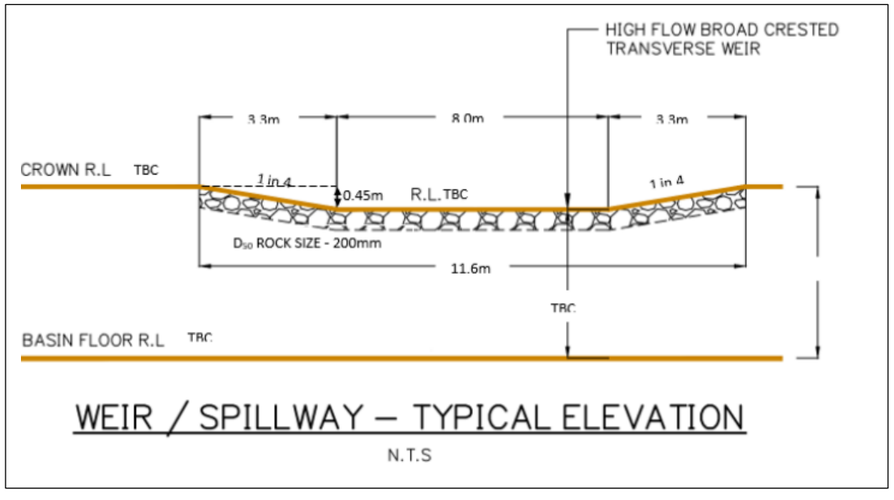


Classification	Minimum particle size	Typical trapped particles
Type 1	< 0.045mm	Clay, silt & sand
Type 2	0.045 – 0.14mm	Silt & sand [1]
Type 3	> 0.14mm	Sand
Supplementary	> 0.14mm	Sand

[1] Technically, silt particles have a grain size of 0.002 to 0.02mm, which means that only Type 1 sediment traps are likely to capture silt-sized particles. However, for general discussion purposes, it can be assumed that Type 2 systems capture a significant proportion of silt-sized particles.

DIVERSION BUND SECTION





WEIR / SPILLWAY – TYPICAL ELEVATION

N.T.S

EROSION & SEDIMENT CONTROL PLAN

Courtney Drive Estate Stage 1-3, Upper Coomera

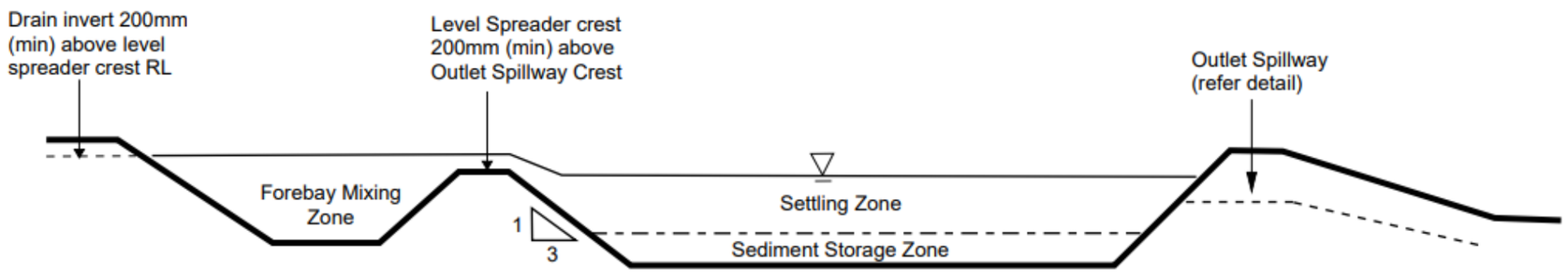
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Date: 16/10/23

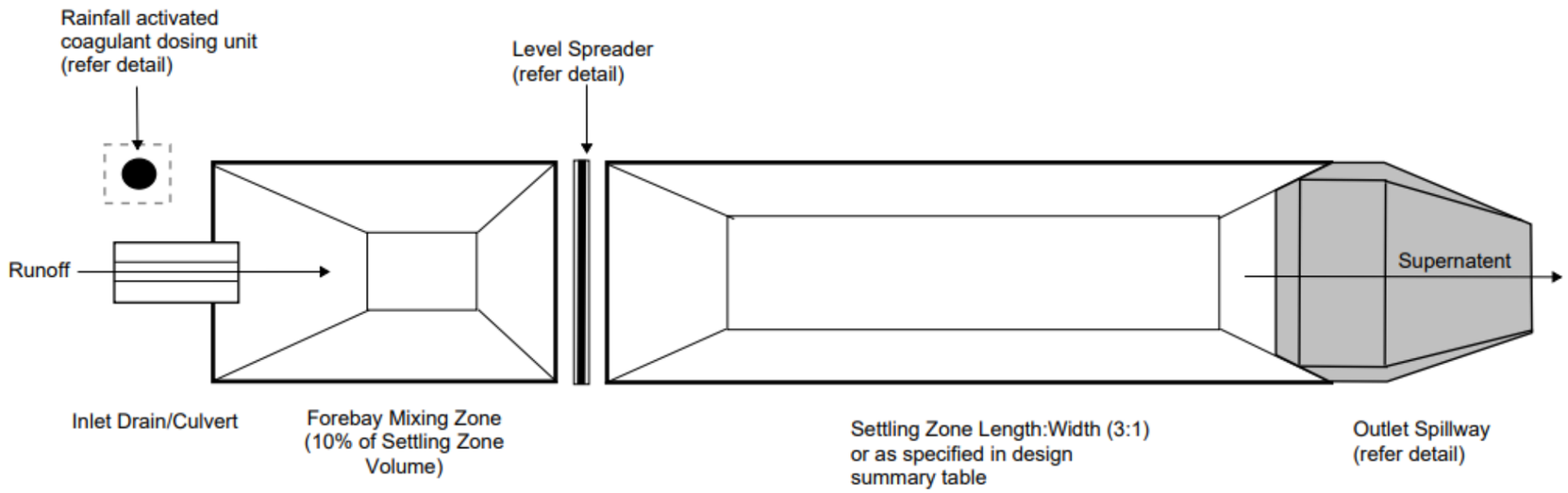
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Sediment Basin

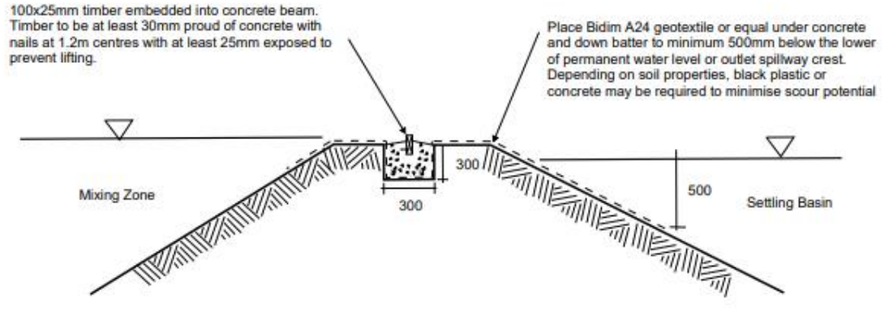
		Q3mth Design Flowrate Calc.						Settling Zone						Forebay		Sediment Storage Zone			Overall Dimensions relative to spillway crest (excl. Forebay)			Spillway									
Basin ID	Catchment Area (Ha)	C_{10}	C_1	tc	$I_{1yr,tc}$ (mm/hr)	Q1yr (m^3/s)	Q3mth (m^3/s)	Residence Time (hr)	Settling Zone Depth (m)	Ave. settling zone area (m2)	Settling Volume (m3)	W:L (1:X)	Scour Velocity (m/s)	Forebay Min. Depth (m)	Forebay Vol (m3)	Sed Storage Vol (m3)	Sed Storage depth (approx.) (m3)	Batter (1:X)	Width (m)	Length (m)	Depth (m)	Basin Design Life	Design ARI	C	I (mm/hr)	Q (m^3/s)	Head over spillway (m)	Spillway crest length (m)	Spillway Crest RL (m)	Min Embankment RL (m)
1	4.36	0.7	0.56	10	5.19	0.04	0.02	2	0.6	471	1369	3	0.002	1	137	311	0.2	3	14.3	43.0	0.8	3-12months	1:20yr	0.74	143	1.27	0.3	4.6	10	10.75
2	2.91	0.7	0.56	10	5.19	0.02	0.01	2	0.6	314	914	3	0.002	1	91	289	0.2	3	12.0	36.1	0.8	3-12months	1:20yr	0.74	143	0.85	0.3	3.0	10	10.75
3	5.4	0.7	0.56	10	5.19	0.04	0.02	2	0.6	583	1695	3	0.003	1	170	537	0.2	3	15.7	47.2	0.8	3-12months	1:20yr	0.74	143	1.58	0.3	5.6	10	10.75



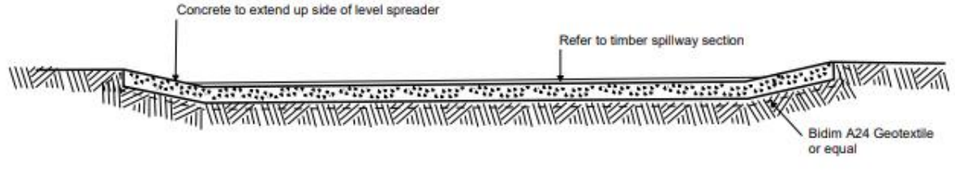
Type B Sediment Basin Long Section (Typical NTS)



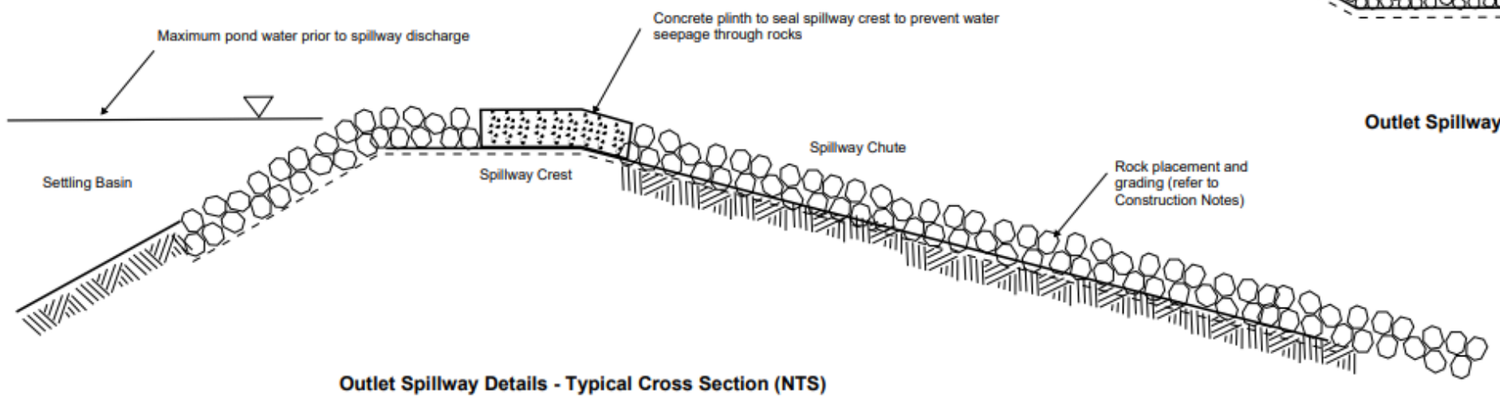
Type B Sediment Basin Plan View (Typical NTS)



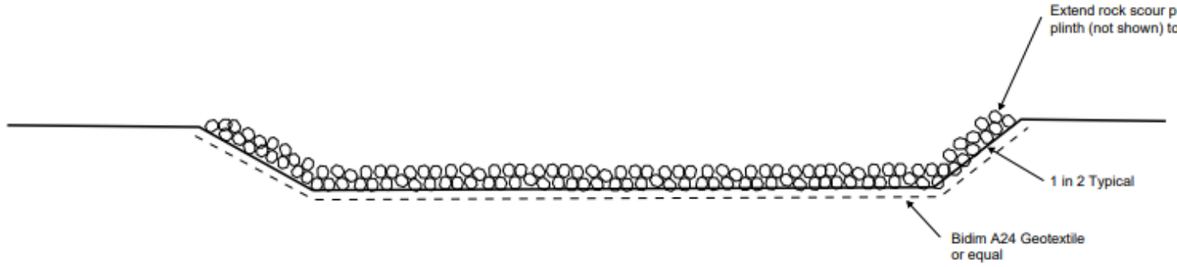
Level Spreader Details - Typical Cross Section (NTS)



Level Spreader Details - Typical Long Section (NTS)



Outlet Spillway Details - Typical Cross Section (NTS)



Outlet Spillway Details - Typical Long Section (NTS)

EROSION & SEDIMENT CONTROL PLAN

Courtney Drive Estate Stage 1-3, Upper Coomera

Rev: 0

Date: 16/10/23

ESCP No. 002

Notes:

Auto Doser

1. Provided as either Floc Box or iFOD-Rain to manufacturers specification.
2. Doser and supply of flocculant to be provided on level pad 4mx4m within 10m of dosing point.
3. All-weather access track to be provided to doser.
4. Flocculant provided as Turbiclear (ACH). If alternative flocculant used then the basin size is to be increased according to jar settlement test (refer to table below.

Jar Settlement after 15 mins (mm)	Multiplication Factor to Settling Zone Volume
50	x3
75	x2
100	x1.5
150	x1

Basin construction:

Materials-

5. Earth Fill: clean soil with Emerson Class 2(1), 3, 4 or 5 and free of roots, woody vegetation, rocks and other unsuitable material. Soil with Emerson Class 4 and 5 may not be suitable depending on particle size distribution and degree of dispersion. Class 2(1) should only be used upon recommendation from geotechnical specialist.
6. Spillway rock: hard, angular, durable, weather resistant and evenly graded rock with 50% by weight larger than the specified nominal (d50) rock size. Large rock should dominate, with sufficient small rock to fill the voids between larger rock. the diameter of the largest rock should be no larger than 1.5 times the nominal rock size. The specific gravity should be at least 2.5.
7. Geotextile fabric: heavy duty, needle-punched, non-woven cloth, minimum 'bidim' A24 or equivalent.

Construction-

8. Notwithstanding any description contained with approved plans or specifications, the Contractor shall be responsible for satisfying themselves as to the nature and extent of the specified works and the physical and legal conditions under which the works will be carried out. This shall include means of access, extent of clearing, nature of the materials to be excavated, type and size of mechanical plant required, location and suitability of water supply for construction and testing purposes, and any other likely matters affecting the construction of the works.
9. Refer to approved plans for location, dimensions, and construction details. If there are questions or problems with the location, dimensions, or method of installation, contact the engineer or responsible on-site officer for assistance.
10. Before starting any clearing or construction, ensure all the necessary materials and components are on the site to avoid delays in completing the sediment basin once works begin.
11. Install requires short term sediment control measures downstream of the proposed earthworks to control sediment runoff during construction of the basin.
12. The area to be covered by the embankment, borrow pits and incidental works, together with an area extending beyond the limits of each for a distance not exceeding five (5) metres all around must be cleared of all trees, scrub, stumps, roots, dead timber and rubbish and disposed of in a suitable manner. Delay clearing the main basin area until the embankment is complete.
13. Ensure all holes made by grubbing within the embankment footprint are filled with sound material, adequately compacted, and finished flush with the natural surface.

Cut-off Trench-

14. Before construction of the cut-off trench or any ancillary works within the embankment footprint, all grass growth and topsoil must be removed from the area to be occupied by the embankment and must be deposited clear of this area and reserved for topdressing the completed embankment.
15. Excavate a cut-off trench along the centre line of the earth fill embankment. Cut the trench to stable soil material, but in no case make it less than 600mm deep. the cut-off trench must extend into both abutments to at least the elevation of the outlet spillway crest. Make the minimum bottom width wide enough to permit operation of the excavation and compaction equipment, but in no case less than 600mm. Make the side slopes of the trench no steeper than 1:1 (H:V).
16. Ensure all water, loose soil, and rock are removed from the trench before backfilling commences. The cut-off trench must be backfilled with select earth-fill of the type specified for the embankment, and this soil must have a moisture content and degree of compaction the same as specified for the core zone.
17. Material excavated from the cut-off trench may be used in the construction of the embankment provided it is suitable and it is placed in the correct zone according to its classification.

Embankment-

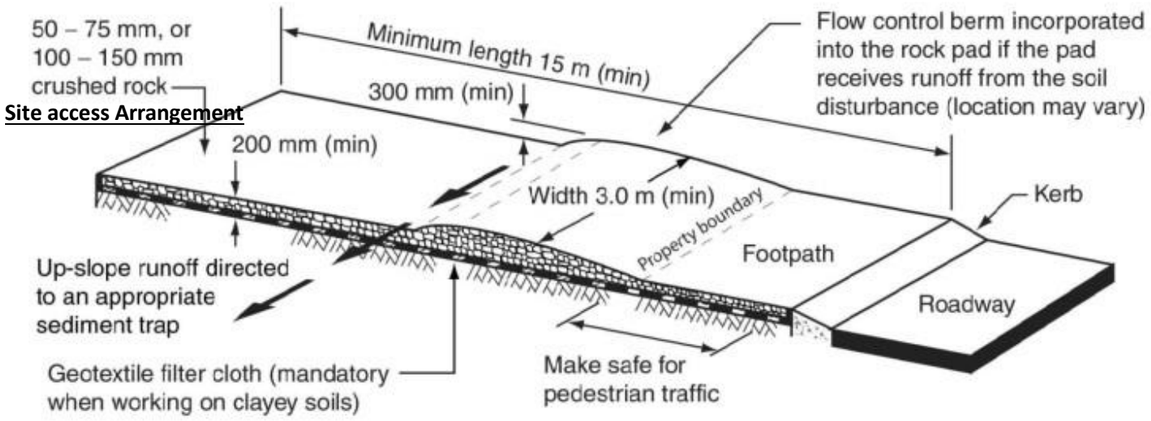
18. Scarify areas on which fill is to be placed before placing the fill.
19. Ensure al fill material used to form the embankment meets the specifications certified by a soil scientist of geotechnical specialist.
20. The fill material must contain sufficient moisture so it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Place fill material in 150 to 200mm continuous layers over the entire length of the fill area and then compact before placement of further fill.
21. Unless specified on the approved plans, compact the soil at about 1% to 2% wet optimum and to 95% modified or 100% standard compaction.embankment to an elevation 10% higher than the design height to allow for settling
22. Where both dispersive and non-dispersive classified earth-fill materials are available, non-dispersive earth-fill must be used in the core zone. the remaining classified earth-fill materials must only be used as directed by the site superintendent.
23. Where specified, construct the embankment to an elevation 10% higher than the design height to allow for settling; otherwise finished dimensions of the embankment after spreading of topsoil must conform to the drawing with a tolerance of 75mm from specified dimensions.
24. Ensure debris and other unsuitable building waste is not placed within the earth embankment.
25. After completion of the embankment all loose uncompacted earth-fill material on the upstream and downstream batter must be removed prior to spreading topsoil.
26. Topsoil and re-vegetate/stabilise all exposed earth as directed within the approved plans.

Spillway construction-

27. The spillway must be excavated as shown on the plans, and the excavated material if classified as suitable, must be used in the embankment, and if not suitable it must be disposed of into spoil heaps.
28. Ensure excavated dimensions allow adequate boxing-out such that the specified elevations, grades, chute width, and entrance and exit slopes for the emergency spillway will be achieved after placement of the rock or other scour protection measures as specified in the plans.
29. Place specified scour protection measures on the emergency spillway. Ensure the finished grade blends with the surrounding area to allow a smooth flow transition from spillway to downstream channel.
30. If a synthetic filter fabric underlay is specified, place the fabric directly on the prepared foundation. if more than 1 sheet of filter fabric is required, overlap the edges by at least 300mm and place anchor pins at minimum 1m spacing along the overlap. bury the upstream end of the filter fabric a minimum 300mm below ground and where necessary, bury the lower end of the fabric or overlap a minimum 300mm over the next downstream section as required. Ensure the filter fabric extends at least 1000mm upstream of the spillway crest.
31. Take care not to damage the fabric during or after placement. If damage occurs, remove the rock and repair the sheet by adding another layer of fabric with a minimum overlap of 300mm around the damaged area.3If extensive damage is suspected, remove and replace the entire sheet.
32. where large rock is used, or machine placement is difficult, a minimum 100mm layer of fine gravel, aggregate, or sand may be needed to protect the fabric.
33. Placement of rock should follow immediately after placement of the filter fabric. Place rock so that it forms a dense, well graded mass of rock with a minimum of voids. the desired distribution of rock throughout the mass may be obtained by selective loading at the quarry and controlled dumping during final placement.
34. The finished slope should be free of pockets of small rock or clusters of large rocks. Hand placing may be necessary to achieve the proper distribution of rock sizes to produce a relatively smooth, uniform surface. the finished grade of the rock should blend with the surrounding are. No overfall or protrusion of rock should be apparent.
35. Ensure that the final arrangement of the spillway crest will not promote excessive flow through the rock such that the water can be retained within the settling basin at the elevation no less than 50mm above of below the nominated spillway crest elevation.

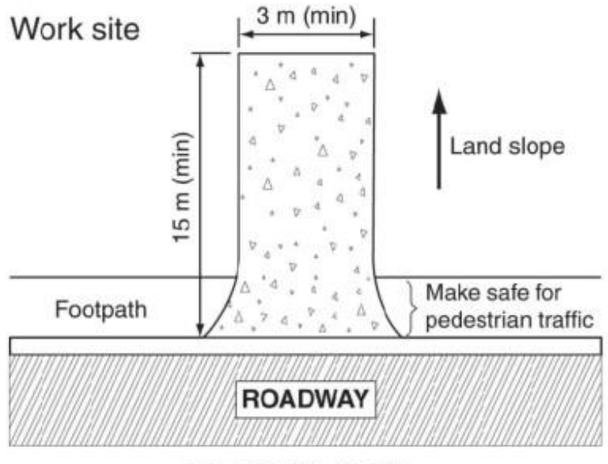
Establishing the settling pond-

36. The area to be covered by the stored water outside of the limits of the borrow pits must be cleared rubbish. Trees must be cut down stump high and removed from the immediate vicinity of the work.
37. Establish all required inflow chutes and inlet baffles, if specified, to enable water to discharge into the basin in a manner that will not cause soil erosion or the re-suspension of settled sediment.
38. Install a sediment storage level marker post with a cross member set just below the top of the sediment storage zone (as specified on the approved plans). Use at least a 75mm wide post firmly set into the basin floor.
39. If specified, install internal settling pond baffles. Ensure the crest of these baffles is set level with, or just below, the elevation of the emergency spillway.
40. Install all appropriate measures to minimise safety risk to on-site personnel and the public caused by the presence of the settling pond. Avoid steep, smooth internal slopes. Appropriately fence the settling pond and post warning signs if unsupervised public access is likely or there is considered to be an unacceptable risk to the public.



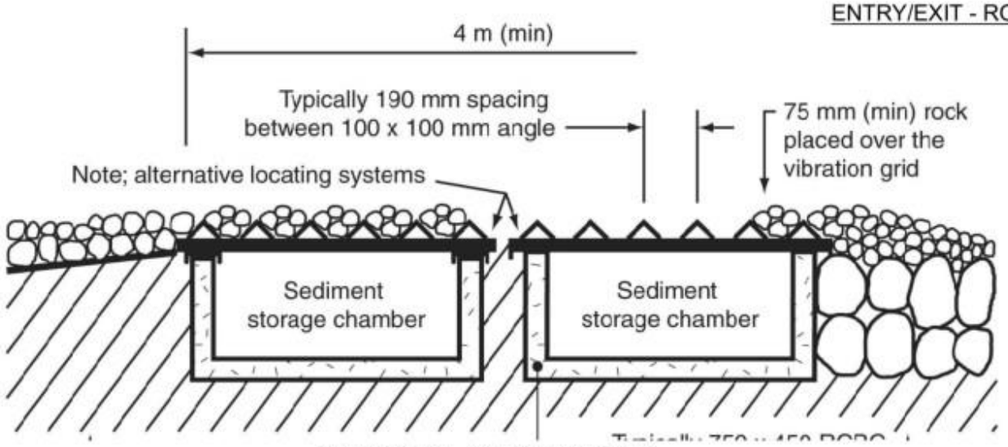
Site access Arrangement

ENTRY/EXIT - ROCK

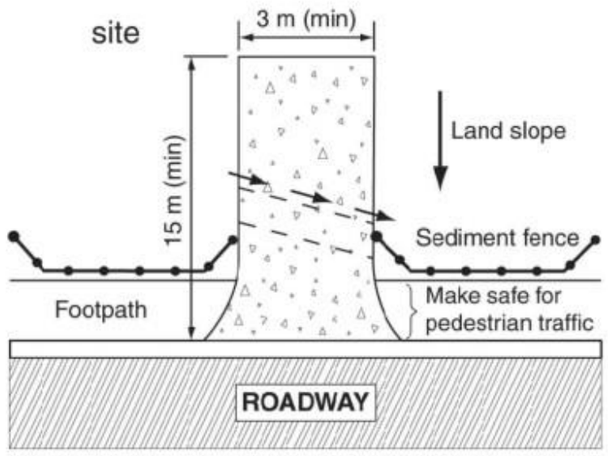


ENTRY/EXIT - ROCK
(SLOPING AWAY FROM ROAD)

ENTRY/EXIT - ROCK



ENTRY/EXIT - VIBRATION GRID



ENTRY/EXIT - ROCK
(SLOPING TOWARD ROAD)

STANDARD DRAWINGS SOURCED FROM CATCHMENT AND CREEKS

EROSION & SEDIMENT CONTROL PLAN

Courtney Drive Estate Stage 1-3, Upper Coomera

Rev: 0

Date: 16/10/23

ESCP No. 002

MATERIALS

ROCK: 150 TO 300mm NOMINAL DIAMETER, HARD, EROSION RESISTANT ROCK. SMALLER ROCK MAY BE USED IF SUITABLE LARGE ROCK IS NOT AVAILABLE.

SANDBAGS: GEOTEXTILE BAGS (WOVEN SYNTHETIC, OR NON-WOVEN BIODEGRADABLE) FILLED WITH CLEAN COARSE SAND, CLEAN AGGREGATE, STRAW OR COMPOST.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. PRIOR TO PLACEMENT OF THE CHECK DAMS, ENSURE THE TYPE AND SIZE OF EACH CHECK DAMS WILL NOT CAUSE A SAFETY HAZARD OR CAUSE WATER TO SPILL OUT OF THE DRAIN.

3. LOCATE THE FIRST CHECK DAM AT THE DOWNSTREAM END OF THE SECTION OF CHANNEL BEING PROTECTED. LOCATE EACH SUCCESSIVE CHECK DAM SUCH THAT THE CREST OF THE IMMEDIATE DOWNSTREAM DAM IS LEVEL WITH THE TOE OF THE CHECK DAM BEING INSTALLED.

4. ENSURE THE CHANNEL SLOPE IS NO STEEPER THAN 10:1 (H:V). OTHERWISE CONSIDER THE USE OF A SUITABLE CHANNEL LINER INSTEAD OF THE CHECK DAMS.

5. CONSTRUCT THE CHECK DAM TO THE DIMENSIONS AND PROFILE SHOWN WITHIN THE APPROVED PLAN.

6. WHERE SPECIFIED, THE CHECK DAMS SHALL BE CONSTRUCTED ON A SHEET OF GEOTEXTILE FABRIC USED AS A DOWNSTREAM SPLASH PAD.

7. EACH CHECK DAM SHALL BE EXTENDED UP THE CHANNEL BANK (WHERE PRACTICABLE) TO AN ELEVATION AT LEAST 150mm ABOVE THE CREST LEVEL OF THE DAM.

MAINTENANCE

1. INSPECT EACH CHECK DAM AND THE DRAINAGE CHANNEL AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.

2. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN ANY OF THE CHECK DAMS, THEN CHECK THE SPACING OF DAMS AND WHERE NECESSARY INSTALL INTERMEDIATE CHECK DAMS OR A SUITABLE CHANNEL LINER.

3. CHECK FOR DISPLACEMENT OF THE CHECK DAMS

4. CHECK FOR SOIL SCOUR AROUND THE ENDS OF EACH CHECK DAM. IF SUCH EROSION IS OCCURRING, CONSIDER EXTENDING THE WIDTH OF THE CHECK DAM TO AVOID SUCH PROBLEMS.

5. IF SEVERE SOIL EROSION OCCURS EITHER UNDER OR AROUND THE CHECK DAMS, THEN SEEK EXPERT ADVICE ON AN ALTERNATIVE TREATMENT MEASURE.

6. REMOVE ANY SEDIMENT ACCUMULATED BY THE CHECK DAMS, UNLESS IT IS INTENDED THAT THIS SEDIMENT WILL REMAIN WITHIN THE CHANNEL.

7. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. WHEN CONSTRUCTION WORK WITHIN THE DRAINAGE AREA ABOVE THE CHECK DAMS HAS BEEN COMPLETED, AND THE DISTURBED AREAS AND THE DRAINAGE CHANNEL ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, ALL TEMPORARY CHECK DAMS MUST BE REMOVED.

2. REMOVE THE CHECK DAMS AND ASSOCIATED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

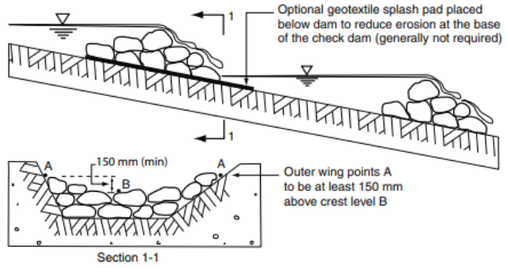


Figure 1 - Layout and profile of check dams (rock check dams shown)

Drawn:	Date:		
GMW	Dec-09	Check Dams	RCD-01

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INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE ALL NECESSARY SOIL TESTING (e.g. SOIL pH, NUTRIENT LEVELS) AND ANALYSIS HAS BEEN COMPLETED, AND REQUIRED SOIL ADJUSTMENTS PERFORMED PRIOR TO PLANTING.

3. CLEAR THE LOCATION FOR THE CHANNEL, CLEARING ONLY WHAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND CONSTRUCTION EQUIPMENT.

4. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY. DO NOT USE DEBRIS TO BUILD ANY ASSOCIATED EMBANKMENTS.

5. EXCAVATE THE DIVERSION CHANNEL TO THE SPECIFIED SHAPE, ELEVATION AND GRADIENT. THE SIDES OF THE CHANNEL SHOULD BE NO STEEPER THAN A 2:1 (H:V) IF CONSTRUCTED IN EARTH, UNLESS SPECIFICALLY DIRECTED WITHIN THE APPROVED PLANS.

6. STABILISE THE CHANNEL AND BANKS IMMEDIATELY UNLESS IT WILL OPERATE FOR LESS THAN 30 DAYS. IN EITHER CASE, TEMPORARY EROSION PROTECTION (MATTING, ROCK, ETC.) WILL BE REQUIRED AS SPECIFIED WITHIN THE APPROVED PLANS OR AS DIRECTED.

7. ENSURE THE CHANNEL DISCHARGES TO A STABLE AREA.

ADDITIONAL REQUIREMENTS FOR TURF PLACEMENT:

1. TURF SHOULD BE USED WITHIN 12 HOURS OF DELIVERY, OTHERWISE ENSURE THE TURF IS STORED IN CONDITIONS APPROPRIATE FOR THE WEATHER CONDITIONS (e.g. A SHADED AREA).

2. MOISTENING THE TURF AFTER IT IS UNROLLED WILL HELP MAINTAIN ITS VIABILITY.

3. TURF SHOULD BE LAID ON A MINIMUM 75mm BED OF ADEQUATELY FERTILISED TOPSOIL. RAKE THE SOIL SURFACE TO BREAK THE CRUST JUST BEFORE LAYING THE TURF.

4. DURING THE WARMER MONTHS, LIGHTLY IRRIGATE THE SOIL IMMEDIATELY BEFORE LAYING THE TURF.

5. ENSURE THE TURF IS NOT LAID ON GRAVEL, HEAVILY COMPACTED SOILS, OR SOILS THAT HAVE BEEN RECENTLY TREATED WITH HERBICIDES.

6. ENSURE THE TURF EXTENDS UP THE SIDES OF THE DRAIN AT LEAST 100mm ABOVE THE ELEVATION OF THE CHANNEL INVERT, OR AT LEAST TO A SUFFICIENT ELEVATION TO FULLY CONTAIN EXPECTED CHANNEL FLOW.

7. ON CHANNEL GRADIENTS OF 3:1(H:V) OR STEEPER, OR IN SITUATIONS WHERE HIGH FLOW VELOCITIES (i.e. VELOCITY >1.5m/s) ARE LIKELY WITHIN THE FIRST TWO WEEK FOLLOWING PLACEMENT, SECURE THE INDIVIDUAL TURF STRIPS WITH WOODEN OR PLASTIC PEGS.

8. ENSURE THAT INTIMATE CONTACT IS ACHIEVED AND MAINTAINED BETWEEN THE TURF AND THE SOIL SUCH THAT SEEPAGE FLOW BENEATH THE TURF IS AVOIDED.

9. WATER UNTIL THE SOIL IS WET 100mm BELOW THE TURF. THEREAFTER, WATERING SHOULD BE SUFFICIENT TO MAINTAIN AND PROMOTE HEALTHY GROWTH

MAINTENANCE

1. DURING THE SITE'S CONSTRUCTION PERIOD, INSPECT THE DIVERSION CHANNEL WEEKLY AND AFTER ANY INCREASE IN FLOWS WITHIN THE CHANNEL. REPAIR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD.

2. ENSURE FILL MATERIAL OR SEDIMENT IS NOT PARTIALLY BLOCKING THE CHANNEL. WHERE NECESSARY, REMOVE ANY DEPOSITED MATERIAL TO ALLOW FREE DRAINAGE.

3. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. WHEN CONSTRUCTION WORK ABOVE A TEMPORARY DIVERSION CHANNEL IS FINISHED AND THE AREA IS STABILISED, THE AREA SHOULD BE APPROPRIATELY REHABILITATED.

2. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA AND SMOOTH IT OUT IN PREPARATION FOR STABILISATION.

4. STABILISE THE AREA AS SPECIFIED IN THE APPROVED PLAN.

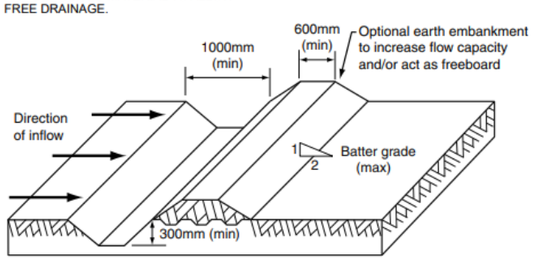


Figure 1 - Typical profile of diversion channel with bank

Drawn:	Date:		
GMW	Dec-09	Diversion Channels	DC-01

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INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CLEAR THE LOCATION FOR THE BERM, CLEARING ONLY THE AREA THAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND EQUIPMENT.

3. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY.

4. FORM THE BERM FROM THE MATERIAL, AND TO THE DIMENSION SPECIFIED IN THE APPROVED PLANS.

5. IF FORMED FROM SANDBAGS, THEN ENSURE THE BAGS ARE TIGHTLY PACKED SUCH THAT WATER LEAKAGE THROUGH THE BAGS IS MINIMISED.

6. CHECK THE ALIGNMENT OF THE BERM TO ENSURE POSITIVE DRAINAGE IN THE DESIRED DIRECTION.

7. ENSURE THE BERM DISCHARGES TO A STABLE OUTLET.

8. ENSURE THE BERM DOES NOT DISCHARGE TO AN UNSTABLE FILL SLOPE.

MAINTENANCE

1. INSPECT FLOW CONTROL BERMS AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.

2. INSPECT THE BERM FOR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD. MAKE REPAIRS AS NECESSARY.

3. CHECK THAT FILL MATERIAL OR SEDIMENT HAS NOT PARTIALLY BLOCKED THE DRAINAGE PATH UP-SLOPE OF THE EMBANKMENT. WHERE NECESSARY, REMOVE ANY DEPOSITED MATERIAL TO ALLOW FREE DRAINAGE.

4. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

5. REPAIR ANY PLACES IN THE BERM THAT ARE WEAKENED OR IN RISK OF FAILURE.

REMOVAL

1. WHEN THE SOIL DISTURBANCE ABOVE THE BANK IS FINISHED AND THE AREA IS STABILISED, THE FLOW CONTROL BERM SHOULD BE REMOVED, UNLESS IT IS TO REMAIN AS A PERMANENT DRAINAGE FEATURE.

2. DISPOSE OF ANY SEDIMENT OR EARTH IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.
3. GRADE THE AREA AND SMOOTH IT OUT IN PREPARATION FOR STABILISATION.

4. STABILISE THE AREA BY GRASSING OR AS SPECIFIED IN THE APPROVED PLAN.

Table 1 - Recommended dimensions of flow control berms

Parameter	Earth banks	Vegetated banks	Compost berms	Sandbag berms
Height (min)	500 mm	500 mm	300 mm	N/A
Top width (min)	500 mm	500 mm	100 mm	N/A
Base width (min)	2500 mm	2500 mm	600 mm	N/A
Side slope (max)	2:1 (H:V)	2:1 (H:V)	1:1 (H:V)	N/A
Freeboard	300 mm	150 mm	100 mm	50 mm

Drawn:	Date:		
GMW	Dec-09	Flow Control Berms	CB-01

Catchments & Creeks Pty Ltd

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CLEAR THE LOCATION FOR THE BANK, CLEARING ONLY THE AREA THAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND EQUIPMENT.

3. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY. DO NOT USE DEBRIS TO BUILD THE BANK.

4. FORM THE BANK FROM THE MATERIAL, AND TO THE DIMENSION SPECIFIED IN THE APPROVED PLANS.

5. IF EARTH IS USED, THEN ENSURE THE SIDES OF THE BANK ARE NO STEEPER THAN A 2:1 (H:V) SLOPE, AND THE COMPLETED BANK MUST BE AT LEAST 500mm HIGH.

6. IF FORMED FROM SANDBAGS, THEN ENSURE THE BAGS ARE TIGHTLY PACKED SUCH THAT WATER LEAKAGE THROUGH THE BAGS IS MINIMISED.

7. CHECK THE BANK ALIGNMENT TO ENSURE POSITIVE DRAINAGE IN THE DESIRED DIRECTION.

8. THE BANK SHOULD BE VEGETATED (TURFED, SEEDED AND MULCHED), OR OTHERWISE STABILISED IMMEDIATELY, UNLESS IT WILL OPERATE FOR LESS THAN 30 DAYS OR IF SIGNIFICANT RAINFALL IS NOT EXPECTED DURING THE LIFE OF THE BANK.

9. ENSURE THE EMBANKMENT DRAINS TO A STABLE OUTLET, AND DOES NOT DISCHARGE TO AN UNSTABLE FILL SLOPE.

MAINTENANCE

1. INSPECT FLOW DIVERSION BANKS AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.

2. INSPECT THE BANK FOR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD. MAKE REPAIRS AS NECESSARY.

3. CHECK THAT FILL MATERIAL OR SEDIMENT HAS NOT PARTIALLY BLOCKED THE DRAINAGE PATH UP-SLOPE OF THE EMBANKMENT. WHERE NECESSARY, REMOVE ANY DEPOSITED MATERIAL TO ALLOW FREE DRAINAGE.

4. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

5. REPAIR ANY PLACES IN THE BANK THAT ARE WEAKENED OR IN RISK OF FAILURE.

REMOVAL

1. WHEN THE SOIL DISTURBANCE ABOVE THE BANK IS FINISHED AND THE AREA IS STABILISED, THE FLOW DIVERSION BANK SHOULD BE REMOVED, UNLESS IT IS TO REMAIN AS A PERMANENT DRAINAGE FEATURE.

2. DISPOSE OF ANY SEDIMENT OR EARTH IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA AND SMOOTH IT OUT IN PREPARATION FOR STABILISATION.

4. STABILISE THE AREA BY GRASSING OR AS SPECIFIED IN THE APPROVED PLAN.

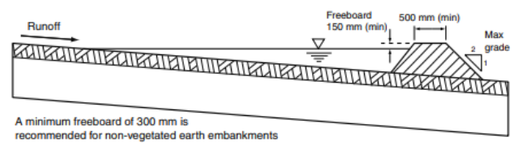


Figure 1 - Typical profile of flow diversion bank formed from earth

Table 1 - Recommended dimensions of flow diversion banks

Parameter	Earth banks	Vegetated banks	Compost berms	Sandbag berms
Height (min)	500 mm	500 mm	300 mm	N/A
Top width (min)	500 mm	500 mm	100 mm	N/A
Base width (min)	2500 mm	2500 mm	600 mm	N/A
Side slope (max)	2:1 (H:V)	2:1 (H:V)	1:1 (H:V)	N/A
Freeboard	300 mm	150 mm	100 mm	50 mm

Drawn:	Date:		
GMW	Dec-09	Flow Diversion Banks	DB-01

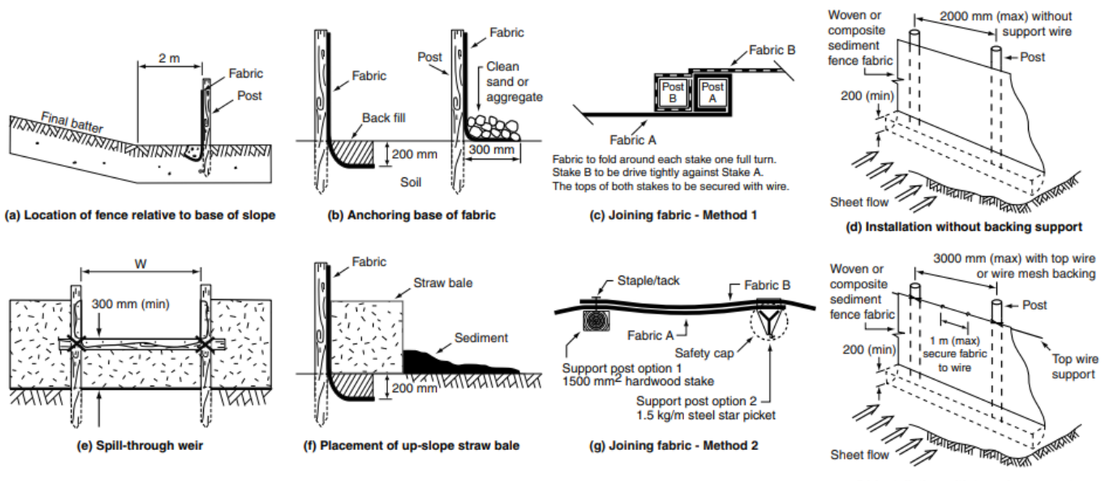
EROSION & SEDIMENT CONTROL PLAN

Courtney Drive Estate Stage 1-3, Upper Coomera

Rev: 0

Date: 16/10/23

ESCP No. 002



Notes:

1. Sediment fence to be installed along a line of constant ground elevation wherever practical.
2. Both end of the sediment fence to extend up the slope at least 1m.
3. Support post to be spaced a maximum 2m unless the fence is supported by a top wire or wire mesh backing, in which case 3m maximum spacing.
4. Fence 'returns' shall be installed at maximum 20m spacing if fence is installed along the contour, otherwise 5 to 10m maximum spacing.
5. Minimum 4 staples or tie wires per stake.

Drawn:	Date:		
GMW	Dec-09	Sediment Fence	SF-01

Catchments & Creeks Pty Ltd

MATERIALS

POLYACRYLAMIDE:
(i) CHOICE OF POLYACRYLAMIDE SHOULD BE BASED ON THE MOST ENVIRONMENTALLY SAFE, ANIONIC PRODUCT AVAILABLE. CATIONIC POLYACRYLAMIDE SHALL NOT BE USED.

(ii) POLYACRYLAMIDE USED FOR EROSION AND SEDIMENT CONTROL SHALL BE WATER SOLUBLE, LINEAR, OR NON-CROSS LINKED.

(iii) GRANULAR POLYACRYLAMIDE MUST BE STORED OUT OF THE SUN WHILE NOT IN USE.

APPLICATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND APPLICATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF APPLICATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. POLYACRYLAMIDE, COMBINED WITH WATER, IS VERY SLIPPER AND CAN REPRESENT A SAFETY HAZARD. APPROPRIATE MANAGEMENT OF ANY SAFETY HAZARD MUST BE ACHIEVED.

3. ENSURE ALL POLYACRYLAMIDE ARE USED FOR PURPOSES AND AT APPLICATION RATES IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

4. POLYACRYLAMIDE MUST NOT BE ADDED TO WATER DISCHARGING DIRECTLY FROM THE SITE.

5. PRE-DISSOLVE THE DRY, GRANULAR POLYACRYLAMIDE INTO A CONCENTRATED SOLUTION OVERNIGHT OR SEVERAL HOURS BEFORE USAGE.

6. PRIOR TO APPLICATION, ENSURE SUPPLEMENTARY EROSION AND SEDIMENT CONTROL PRACTICES COMPLY WITH BEST PRACTICE.

7. PRE-FILL A TANK APPROXIMATELY 1/8 FULL WITH WATER PRIOR TO INPUT OF THE PRE-PREPARED, CONCENTRATED POLYACRYLAMIDE SOLUTION. CONTINUE TO FILL THE TANK WITH THE REQUIRED WATER VOLUME. THE WATER MUST HAVE LOW TURBIDITY IN THE RANGE OF 20 NTU OR LESS.

8. APPLY THE MIXTURE UNTIL THE SOIL SURFACE IS UNIFORMLY AND COMPLETELY WETTED.

9. ALL REASONABLE EFFORTS SHOULD BE TAKEN TO APPLY POLYACRYLAMIDE SOLUTION TO THE SOIL WHILE THE SOIL IS IN A 'DRY' CONDITION.

10. DURING APPLICATION, ALL REASONABLE EFFORTS MUST BE TAKEN TO AVOID SPRAY ONTO ROADS, PATHWAYS, DRAINAGE CHANNELS NOT INTENDED FOR APPLICATION, AND EXISTING VEGETATION.

MAINTENANCE

1. INSPECT THE TREATED SURFACE PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORMS OR OTHERWISE AT FORTNIGHTLY INTERVALS.

2. REAPPLY WITHIN 48 HOURS AFTER THE TREATED AREAS HAS BEEN DISTURBED BY EARTHMOVING MACHINERY IF EROSION CONTROL IS REQUIRED.

3. REAPPLY AS NECESSARY ON DAMAGED AREAS.

4. REAPPLICATION IS GENERALLY NOT REQUIRED UNLESS THE TREATED AREA IS DISTURBED, A PERIOD OF 60-DAYS HAS PASSED, OR UNLESS ACCEPTABLE TURBIDITY LEVELS ARE EXCEEDED. IF THE TREATED AREA HAS BEEN MULCHED, THEN REAPPLICATION MAY NOT BE REQUIRED FOR SEVERAL MONTHS.

Drawn:	Date:		
GMW	Dec-09	Polyacrylamide	PAM-01

Catchments & Creeks Pty Ltd

MATERIALS

FABRIC: POLYPROPYLENE, POLYAMIDE, NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN FABRIC, AT LEAST 700mm IN WIDTH AND A MINIMUM UNIT WEIGHT OF 140GSM. ALL FABRICS TO CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

FABRIC REINFORCEMENT: WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.

SUPPORT POSTS/STAKES: 1500mm² (MIN) HARDWOOD, 2500mm² (MIN) SOFTWOOD, OR 1.5kg/m (MIN) STEEL STAR PICKETS SUITABLE FOR ATTACHING FABRIC.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND REQUIRED TYPE OF FABRIC (IF SPECIFIED). IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, FABRIC TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. TO THE MAXIMUM DEGREE PRACTICAL, AND WHERE THE PLANS ALLOW, ENSURE THE FENCE IS LOCATED:
(i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;
(ii) ALONG A LINE OF CONSTANT ELEVATION WHEREVER PRACTICAL;
(iii) AT LEAST 2m FROM THE TOE OF ANY FILLING OPERATIONS THAT MAY RESULT IN SHIFTING SOIL/FILL DAMAGING THE FENCE.

3. INSTALL RETURNS WITHIN THE FENCE AT MAXIMUM 20m INTERVALS IF THE FENCE IS INSTALLED ALONG THE CONTOUR, OR 5 TO 10m MAXIMUM SPACING (DEPENDING ON SLOPE) IF THE FENCE IS INSTALLED AT AN ANGLE TO THE CONTOUR. THE 'RETURNS' SHALL CONSIST OF EITHER:
(i) V-SHAPED SECTION EXTENDING AT LEAST 1.5m UP THE SLOPE; OR
(ii) SANDBAG OR ROCK/AGGREGATE CHECK DAM A MINIMUM 1/3 AND MAXIMUM 1/2 FENCE HEIGHT, AND EXTENDING AT LEAST 1.5m UP THE SLOPE.

4. ENSURE THE EXTREME ENDS OF THE FENCE ARE TURNED UP THE SLOPE AT LEAST 1.5m, OR AS NECESSARY, TO MINIMISE WATER BYPASSING AROUND THE FENCE.

5. ENSURE THE SEDIMENT FENCE IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE FENCE, AND THE UNDESIRABLE DISCHARGE OF WATER AROUND THE ENDS OF THE FENCE.

6. IF THE SEDIMENT FENCE IS TO BE INSTALLED ALONG THE EDGE OF EXISTING TREES, ENSURE CARE IS TAKEN TO PROTECT THE TREES AND THEIR ROOT SYSTEMS DURING INSTALLATION OF THE FENCE. DO NOT ATTACH THE FABRIC TO THE TREES.

7. UNLESS DIRECTED BY THE SITE SUPERVISOR OR THE APPROVED PLANS, EXCAVATE A 200mm WIDE BY 200mm DEEP TRENCH ALONG THE PROPOSED FENCE LINE, PLACING THE EXCAVATED MATERIAL ON THE UP-SLOPE SIDE OF THE TRENCH.

8. ALONG THE LOWER SIDE OF THE TRENCH, APPROPRIATELY SECURE THE STAKES INTO THE GROUND SPACED NO GREATER THAN 3m IF SUPPORTED BY A TOP SUPPORT WIRE OR WEIR MESH BACKING, OTHERWISE NO GREATER THAN 2m.

9. IF SPECIFIED, SECURELY ATTACH THE SUPPORT WIRE OR MESH TO THE UP-SLOPE SIDE OF THE STAKES WITH THE MESH EXTENDING AT LEAST 200mm INTO THE EXCAVATED TRENCH. ENSURE THE MESH AND FABRIC IS ATTACHED TO THE UP-SLOPE SIDE OF THE STAKES EVEN WHEN DIRECTING A FENCE AROUND A CORNER OR SHARP CHANGE OF DIRECTION.

10. WHEREVER POSSIBLE, CONSTRUCT THE SEDIMENT FENCE FROM A CONTINUOUS ROLL OF FABRIC. TO JOIN FABRIC EITHER:
(i) ATTACH EACH END TO TWO OVERLAPPING STAKES WITH THE FABRIC FOLDING AROUND THE ASSOCIATED STAKE ONE TURN, AND WITH THE TWO STAKES TIED TOGETHER WITH WIRE; OR
(ii) OVERLAP THE FABRIC TO THE NEXT ADJACENT SUPPORT POST.

11. SECURELY ATTACH THE FABRIC TO THE SUPPORT POSTS USING 25 X 12.5mm STAPLES, OR TIE WIRE AT MAXIMUM 150mm SPACING.

12. SECURELY ATTACH THE FABRIC TO THE SUPPORT WIRE/MESH (IF ANY) AT A MAXIMUM SPACING OF 1m.

13. ENSURE THE COMPLETED SEDIMENT FENCE IS AT LEAST 450mm, BUT NOT MORE THAN 700mm HIGH. IF A SPILL-THOUGH WEIR IS INSTALLED, ENSURE THE CREST OF THE WEIR IS AT LEAST 300mm ABOVE GROUND LEVEL.

14. BACKFILL THE TRENCH AND TAMP THE FILL TO FIRMLY ANCHOR THE BOTTOM OF THE FABRIC AND MESH TO PREVENT WATER FROM FLOWING UNDER THE FENCE.

ADDITIONAL REQUIREMENTS FOR THE INSTALLATION OF A SPILL-THROUGH WEIR

1. LOCATE THE SPILL-THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.

2. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300mm THE GROUND ELEVATION.

3. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS/ STAKES EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.

4. INSTALL A SUITABLE SPLASH PAD AND/OR CHUTE IMMEDIATELY DOWN-SLOPE OF THE SPILL-THROUGH WEIR TO CONTROL SOIL EROSION AND APPROPRIATELY DISCHARGE THE CONCENTRATED FLOW PASSING OVER THE WEIR.

MAINTENANCE

1. INSPECT THE SEDIMENT FENCE AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR ANY TORN SECTIONS WITH A CONTINUOUS PIECE OF FABRIC FROM POST TO POST.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. IF THE FENCE IS SAGGING BETWEEN STAKES, INSTALL ADDITIONAL SUPPORT POSTS.

5. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 1/3 THE HEIGHT OF THE FENCE.

6. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

7. REPLACE THE FABRIC IF THE SERVICE LIFE OF THE EXISTING FABRIC EXCEEDS 6-MONTHS.

REMOVAL

1. WHEN DISTURBED AREAS UP-SLOPE OF THE SEDIMENT FENCE ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE FENCE MUST BE REMOVED.

2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

Drawn:	Date:		
GMW	Apr-10	Sediment Fence	SF-02

Catchments & Creeks Pty Ltd

enviro consulting

Erosion & Sediment Control Plan

Courtney Drive Estate – Stage 1-3, Upper Coomera

Progressive Erosion and Sediment Control Plan – Clearing and Grubbing 001

Revision No	Date	Prepared by	Reviewed By	Approval
0	28/09/2023	Alisha Croft	Michael Jabbour	Alisha Croft CPESC #9428

CPESC	*Alisha Croft*	*0419 674 283*
Senior Project Manager	*Michael Williams*	*0401 857 055*

Alisha Croft #9428

EROSION & SEDIMENT CONTROL PLAN

Courtney Drive Stage 1-3, Upper Coomera

Rev: 0

Date: 28/09/23

ESCP No. 001

1. SCOPE

This Progressive Erosion and Sediment Control Plan (ESCP) has been developed for the clearing and grubbing phase for the Courtney Drive residential estate for Stage 1-3, Upper Coomera QLD. With additional progressive erosion and sediment control plans to be prepared for the Earthworks and Civil stages.

1.1 Guidelines

This ESCP has been prepared in accordance with the following document(s):

- Best Practice Erosion and Sediment Control (IECA, 2008)

1.2 Certification

This ESCP will be reviewed and certified by a CPESC prior to commencement of works. This review and certification will ensure the plan has been prepared to satisfy the intent and minimum standards nominated within the IECA (2008) Best Practice Erosion and Sediment Control Guideline.

2. PROJECT DESCRIPTION

2.1 Location & Land use

The site is located off off Courtney Drive in Upper Coomera and will connect Courtney Drive with Rangeview Road. (**Figure 1**).

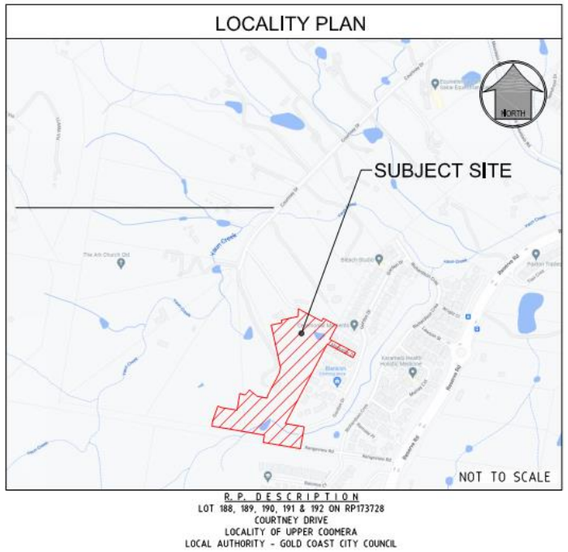


Figure 1: Locality Plan

2.1.1 Scope of Works

The scope of works is as follows:

- Site clearing and grubbing, inclusive of the removal of existing site trees;
- Undertake bulk earthworks activities;
- Construction of proposed lots and establishment of retaining between lots in accordance with design;
- Construction of stormwater infrastructure;
- Construction of proposed residential streets
- Installation of all relevant signage and line marking;

The general arrangement of Erosion and Sediment Controls are illustrated in **figure 2**.

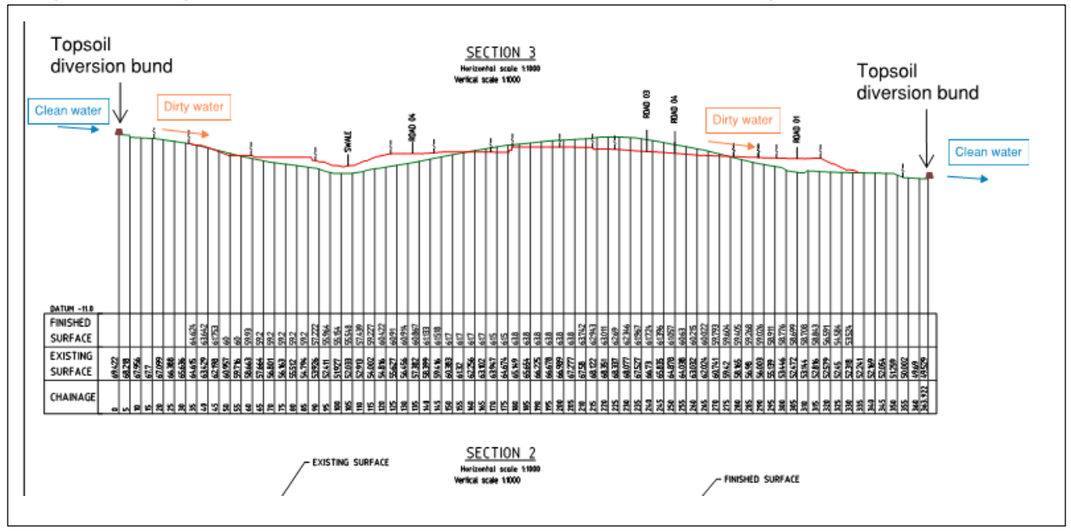


Figure 2: Typical Erosion and sediment control arrangement

3. SITE DESCRIPTION

3.1 Climate & Rainfall risk

Historic rainfall data for Upper Coomera has been extracted from the Coomera Foxwell Road Weather Station (Station No. 40516) the closest long-term gauging station to the site, is illustrated in **Figure 3**. Relatively wetter conditions typically occur from November to June and drier conditions tend to persist from July to October. The corresponding Erosion Risk Rating (rainfall depth) is colour coded from **Table 1** (Based on IECA Table 4.4.2).

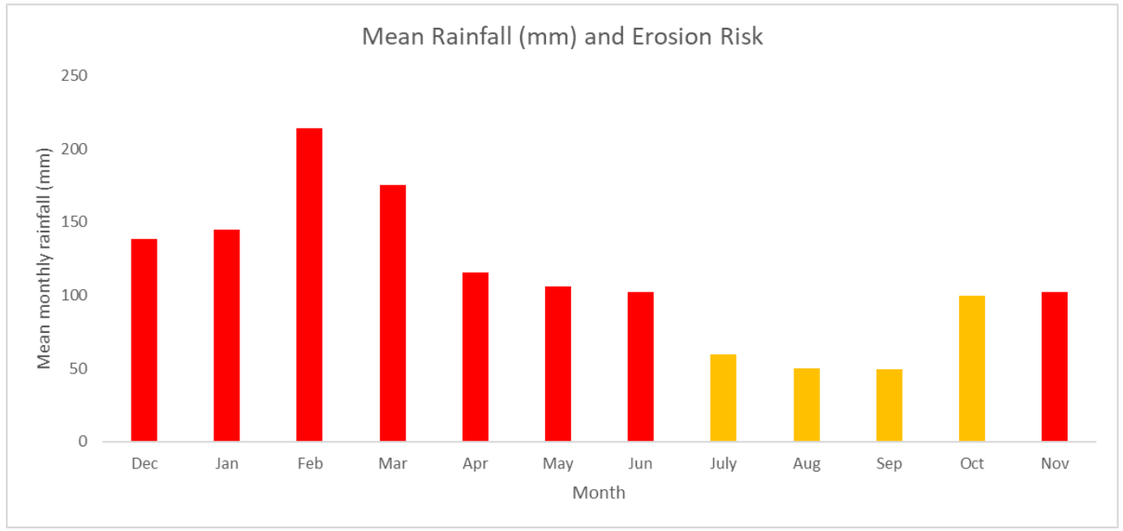


Figure 3: Mean Rainfall data, Coomera Foxwell Road Alert Weather Station #40516 (1997-2023)

Table 1: ***Erosion Risk Rating Categories (rainfall depth) as per Table 4.4.2, IECA, 2008***

Erosion Risk Rating	Average Monthly rainfall depth (mm)
Very Low	0 to 30
Low	30+ to 45
Moderate	45+ to 100
High	100+ to 225
Extreme	>225

3.2 Topography and drainage

Based on contours presented on the IFC Drawings and the Geotechnical report prepared by Pacific Geotech in January 2023, 'the site topography typically comprises a ridge line which meanders in a north south lineation through the centre of the site. The ridge line typically comprises flat or gentle sloping terrain of less than 5° in slope gradient. This ridge line is flanked to the east and west by mild sloping terrain typically ranging between 5° and 15° in slope gradient with some localised steeper areas ranging up to approximately 20° in slope gradient.' (*Geotechnical Investigation and Landslide Risk Assessment for proposed residential subdivision, end of Courtney Drive, Upper Coomera, January 2023, Pacific Geotech*)

Numerous drainage lines are currently present across the site, with the main drainage line traversing from the South western corner towards the north, a wide drainage area discharges to the west and another drainage feature discharges to the north. Each drainage line moves through an existing dam within the confines of the site prior to discharging offsite. The project shall utilize these existing dams as part of the clearing and grubbing phase of the project until the final sediment basins can be established for utilization during earthwork stages.

3.3 Soils

Soils located onsite consist of high plasticity clay soils or clayey sands.

4. RISK ASSESSMENT

4.1 IECA Soil loss assessment

Based on the requirements of IECA (2008), an erosion risk assessment has been conducted using the Revised Universal Soil Loss Equation (RUSLE). The calculated soil loss is then used to determine the level of sediment control required.

$$A = K \times R \times LS \times P \times C$$ Equation 1 (IECA 2008)

Where:

A is the predicted soil loss (t/Ha/yr)
K is the soil erodibility factor
R is the rainfall erosivity factor
LS is the slope length/gradient factor
P is the erosion control practice factor
C is the ground cover and management factor

4.1.1 K - Factor - Soils

Soils located onsite consist of Sandy Clay/ Clay present in area. As such a conservative assumption has been made for the K factor resulting in an adopted K factor of 0.051.

4.1.2 R - Factor - Rainfall

An annual erosivity factor of 5489 has been adopted based on a 2-year, 6-hour rainfall intensity of 15.6mm/hr and the following equation from section E3.2 of IECA (2008).

R = 164.74 (1.1177)S S0.6444

4.1.3 LS – Slope Length

As described in Section 3.2, the topography of the site comprises of moderate slopes. Based on existing/design surface levels, LS factors have been adopted as follows:

- Grades up to 8.75%, slope length will be limited to 25m between checks – adopted LS-factor 2.05

4.1.4 Cover (C) and Practice (P) Factors

A C factor of 1 has been adopted in accordance with industry practice to reflect the worst-case level of cover offered during the proposed development activities.

The P factor represents the combined effect of management practices and structural methods to control erosion. An industry default P factor value of 1.3 has been applied to the risk assessment, which is recommended for the construction phase condition (per table E11 of IECA, 2008).

4.1.5 Estimated Soil Loss

Results of the erosion risk assessment are presented in **Table 2**. Sediment control type derived from IECA (2008) Table 4.5.1

Table 2: Estimated soil loss from each site catchment

Site	Disturbed Area (HA)	R	K	LS	P	C	A (t/ha/yr)	Adopted Control	Comment
Catchment 1	4.36	5489	0.05	1.47	1.3	1	535	Type 1	Check dam spacing at 25m; excavated sediment traps at outlet/discharge locations; and C-factor reduction during months when soil loss exceeds 12.5t/ha/month i.e. from December to March. Note: C-factor reduction can be achieved in a number of ways including application of soilbinder and revegetation treatments
Catchment 2	2.91	5489	0.05	2.05	1.3	1	746	Type 1	
Catchment 3	5.4	5489	0.05	2.05	1.3	1	746	Type 1	

Due to an estimated soil loss of a maximum of 746t/ha/yr based on the construction stage of the proposed works and maximum area proposed for disturbance associated with the project, the Erosion risk is nominated as High in accordance with Table 4.4.3 of IECA (**Table 2**). Erosion and sediment control will be installed for the project in accordance with the risk profile and specific constraints of the site (Table 4).

Table 4: Erosion risk rating based on estimated soil loss rate (as per Table 4.4.3 IECA 2008)

Erosion Risk Rating*	Soil loss (t/ha/yr)
Very Low	0 to 150
Low	150+ to 225
Moderate ✓	225+ to 500
High	500+ to 1500
Extreme	>1500

Table 5: Erosion Control Standards

Erosion Risk as per Table 4.4.7 of IECA	Limit of forward Clearing	Stabilisation – Temporary	Stabilisation – Permanent
All	All reasonable and practicable steps taken to apply best practice erosion control measures to completed earth works, or otherwise stabilise such works, prior to anticipated rainfall-including existing unstable, undisturbed, soil surfaces under the management or control of the building/construction works.		
Low	Clearing and stripping is limited to 8 weeks prior to the scheduled commencement of bulk earthworks	Unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 30 days	Disturbed soil surfaces are stabilised with a minimum 70% cover within 30 days of the completion of works within any area of a work site.
Moderate	Clearing and stripping is limited to 6 weeks prior to the scheduled commencement of bulk earthworks	Unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 20 days.	Disturbed soil surfaces are stabilised with a minimum 70% cover within 20 days of the completion of works within any area of a work site.
High	Clearing and stripping is limited to 4 weeks prior to the scheduled commencement of bulk earthworks	Soil Stockpile & unfinished earthworks are suitably stabilised if rainfall is reasonably possible, and disturbance is expected to be suspended for a period exceeding 10 days.	Disturbed soil surfaces are stabilised with a minimum 75% cover within 10 days of the completion of works within any area of a work site

5. GENERAL NOTES

- This Erosion and Sediment Control Plan (ESCP) has been prepared to provide a site specific ESCP to demonstrate the management of erosion and sediment control in accordance with the Best Practice Erosion and Sediment Control Guidelines (IECA, 2008).
- This ESCP shall be supplemented by Progressive Erosion and Sediment Control Plans (PESCP). PESCPs are to be developed to identify the specific location and, where required, additional erosion and sediment controls applicable to individual work stages. PESCPs shall be documented via mark ups to approved plans. Where a change in the level of sediment control standard is proposed in a PESCP, the PESCP shall be reviewed and approved by an appropriately qualified person prior to the change being implemented.
- Minimise the extent and duration of disturbance, maintaining existing ground cover to the greatest extent possible.
- Commissioning / decommissioning of plant and refuelling to be undertaken a minimum of 30m away from any watercourse/drainage line.
- All ERSED controls to be inspected regularly (weekly, pre/post rainfall event i.e. forecast or actual rainfall of >10mm) with maintenance/repairs to be undertaken when necessary
- Revegetation of disturbed/bare areas to be progressively implemented
- Where clean water drains and sediment traps/sumps are necessary, all clean water drains and sediment traps and associated drainage must be installed and commissioned prior to the commencement of any grubbing works within the catchment area
- All controls must be installed within approved project footprint.
- Ensure all site access is stabilised with rumble grid and clean rock.

6. STAGING

Stage 1 - Vegetation removal, clear and grub, topsoil strip	Phase 1: • Site Establishment of access tracks, clearing and minor topsoil strip in locations for clean water drains only, installation of clean water drains, diversion bunds, clean water diversion drains, sediment basins and traps and other appropriate erosion and sediment controls. Temporary crossings are also to be installed where necessary with clean water diversion drains. Phase 2: • Clearing and grubbing to commence on approval from Project Environmental Site Representative of all clean water drains, sediment traps/basins and establishment controls installed appropriately. Clearing to commence in a sequential approach. Clearing activities will only remove large vegetation and retain groundcover wherever possible. • Vegetation will be stockpiled downslope of cleared zone and accessible from access track in readiness for mulching. Phase 3: • Mulching of stockpiled vegetation and stockpiling of mulch or integration into erosion and sediment controls. Phase 4:

	• Topsoil strip to commence in a staged approach across site and topsoil placed in designated topsoil stockpile areas with controls installed and maintained.
Stage 2 – Bulk Earthworks	Phase 1: • Cut and fill will continue through footprint, establishing supplementary controls as required (locations tbd onsite) such as mulch bunds and sediment fence or geofabric overplaced and wrapped up to act as filter fence at base of fill zones and around drainage inlet locations. Stabilisation to occur on cut/fill batters throughout works. Areas to be progressively revegetated as they are completed. Phase 2: • Civil works to commence, ensuring all site dirty water is directed into existing site sediment basins.
Stage 3 – Stabilisation/ Revegetation	• Site wide stabilisation and revegetation via seeding of any areas not already revegetated as part of progressive stabilisation works. Site must achieve 70% vegetated cover for works to be considered effectively stabilised.

7. DEWATERING AND WATER QUALITY

- Basins to be dewatered prior to rain event that is likely to produce runoff; however, during dry conditions water may be retained in the settling pond as a source of construction water (i.e. dust suppression).
- If possible, it is recommended that dewatering/spread of collected runoff from basins be applied to well vegetated lands at least 40m away from any waterway to allow it to infiltrate within the site boundary, if this is done, ensure water is applied slowly and in a manner that avoids concentrated surface runoff and/or erosion.
- If actively discharging (pumping or siphoning) the water out of the basin, water must be treated to achieve, pH 6.5-8.5, <10mg/L oil and grease and no visible trace and a standard 90%ile total suspended solids concentration not exceeding 50mg/L or 50%ile NTU reading (as per IECA Best Practice Erosion and Sediment Control Guidelines Appendix B) and no more than a 10% increase in background conditions.
- Where captured basin water is to be used onsite for dust suppression or construction purposed, water does not require testing or treatment.

8. DESILTING

- Install an appropriate painted desilting marker in the basin to indicate top of sediment storage zone. Basin must be desilted if the next storm event is likely to cause sediment to rise above this marker point; or if sediment is already above the marker; or if the sediment has exceeded 90% of the nominated sediment storage volume.
- Removal of all sediment/materials collected from the basin to be disposed of in a suitable manner that will not cause an erosion or pollution/environmental hazard.
- Refer to ESCP for recommended volume and dimensions for proposed sediment basin. Note that all dimensions are approximate and subject to verification with review of detailed ground survey and alignment.
- All earthen embankments (for basins or otherwise) greater than 1m in height to be certified by a qualified geotechnical specialist to ensure structural integrity for the desired design criteria and anticipated period of operation
- Upon decommissioning of sediment basins, all water contained within must be removed and disposed of appropriately before the removal of any basin embankments

9. OVERVIEW OF KEY ESC TECHNIQUES

Drainage Controls – Catch Drains (CD) and Diversion Banks (DB)

This ESCP identifies the location of catch drains and diversion banks required to divert upslope clean water away from areas of soil disturbance, stockpiles and excavations, and to collect dirty runoff water from disturbed areas and stockpiles and direct it to a sediment trap and to control water flow through the worksite to avoid damage to unfinished areas of earthworks and infrastructure. Due to the presence of potentially dispersive subsoils on the site, diversion banks have been used wherever possible. Diversion banks, when constructed by pushing soil from the down-slope side, avoid exposing sodic subsoils and maintain in-situ groundcover in the flow path.

Where site mulch is available in sufficient quantities, temporary diversion banks/sediment filters may be formed from mulch. Temporary sandbag diversion banks will also be used to provide temporary diversion of water in locations of limited space and active construction areas prior to forecast wet weather.

Erosion Controls – Soil Binders

Soil binders are a form of chemical surface stabiliser and/or soil-bonding agent applied to exposed soil surfaces to control erosion. Soil binders are suitable for minor drainage lines, upper waterway banks, batters and topsoil stockpiles. Soil binders have been specified for use on batter locations and drainage lines in the project area, to provide temporary erosion control during construction activities and reduce predicted soil loss and associated requirements for sediment controls.

Soilbinders (or revegetation treatments) are required to be applied to disturbed batters between the months of December to March to reduce C-factor prior to rainfall forecast >10mm in 24 hours.

Sediment Controls

The following key sediment controls are specified in this plan and have been applied to individual catchments based on the results of the RUSLE soil loss predictions (Section 3.5).

Sediment basins – Due to the size and slopes present onsite, one Type D sediment basin has been nominated to capture and treat site runoff in applicable catchments.

Rock Checks/Filter Dam (Type 2) – Where drainage topography allows, rock checks and rock filter dams have been utilised to slow the velocities of site dirty water.

Sediment Fence (Type 3) - Sediment fences have been nominated to provide sediment controls in locations that are likely to receive predominantly sheet flows. Used in conjunction with concentrated flow sediment treatment techniques. Where site mulch is available in sufficient quantities, Type 3/perimeter controls may be formed from mulch.

Site Exit / Entry - To prevent sediment tracking onto public roads, stabilised rock pad entry locations have been identified. Associated drainage and sediment controls have been identified to contain and treat runoff in accordance with the adopted sediment control standard for individual catchments. Adjacent roads should be inspected regularly, and any sediment deposited on public roads should be removed in a safe manner and disposed of to an approved disposal facility

10. STOCKPILE MANAGEMENT

Place stripped soil at approved stockpile locations

Stockpile topsoil at a height no greater than 2m.

Stockpile any excess subsoil or spoil separately from topsoils and at designated stockpile locations upslope of sediment traps.

Install non-woven sediment fence (bidim A34 or equiv) around stockpiles as per SD-FF-1

Where topsoil stockpiles will remain undisturbed for greater than nominated erosion standard, apply seeding of a cover crop at the rate of 10kg/ha to topsoil stockpiles. Refer to revegetation specifications for seed mix.

Where subsoil / spoil stockpiles will remain undisturbed for greater then nominated erosion standard, apply temporary cover or soil binder.

Temporary Stabilisation Erosion Standard

Month	Temporary Stabilisation Erosion Standard
Dec, Jan, Feb	10 days
Mar – Jun, Oct – Nov	20 days
July – Sept	30 days

11. INSPECTIONS & MONITORING

All erosion and sediment control measures, including drainage measures, must be always maintained and in proper working order during their operational life.

All drainage, erosion and sediment controls shall be inspected daily when rain is occurring (if site access is available) weekly, prior to and following a rainfall event of sufficient intensity and duration to cause on-site runoff immediately prior to and following periods of site shutdown.

Inspections shall include checks of all drainage, erosion and sediment control measures including site discharge points for:

- evidence of excessive sediment transport and or deposition either on or off site
- evidence of excessive erosion either on site or immediately downstream
- treatment and de-watering requirements for sediment basins / sediment traps
- the progress and stability of site rehabilitation and revegetation works.

Where inspections identify a non-conforming control measure, or issues that are likely to prevent the achievement of the erosion and sediment control objectives, corrective or preventative actions will be developed and implemented as necessary to achieve the required erosion and sediment control performance standards.

A written record / register of monitoring observations and maintenance tasks shall be kept on site and available for inspection.

12. SITE REHABILITATION

The following site rehabilitation requirements are to be read in conjunction with the project specific landscaping, soil management and revegetation plans and applicable project requirements. Where there is an inconsistency between the site rehabilitation measures in this document, and the project specific contract documents, the site specific and contract documents shall prevail.

Disturbed areas shall be stabilised within the following time frames

Permanent Stabilisation Erosion Standard

Month	Temporary Stabilisation Erosion Standard
Dec, Jan, Feb	10 days
Mar – Jun, Oct – Nov	20 days
July – Sept	30 days

Areas shall be considered stable once they achieve 70% cover in 90% of the relevant catchment. Temporary drainage, erosion and sediment control structures shall not be decommissioned until this level of cover is achieved within the upslope catchment.

Compacted areas / areas subject to construction traffic shall be first scarified to a minimum depth of 50mm to address compaction from construction traffic and assist in tying in topsoil. On steeper slopes (<3H:1V) scarification may alternatively be undertaken via track walking up and down the slope.

Stripped topsoil shall be reinstated in accordance with pre-stripping profiles and depths. Topsoil shall be placed at a minimum of 75mm and lightly compacted, reinstating the original top 50mm as the final layer. On slopes steeper than 4H:1V topsoil reinstatement shall be reduced to 50mm to minimise slumping.

Ensure all dispersive / sodic subsoil is adequately covered with a minimum of 50mm of non-dispersive topsoil.

Apply seed, fertiliser and hydromulch to disturbed areas as per rehabilitation specifications.

Apply follow up watering on a daily basis (subject to weather conditions) to hydromulched areas.

Any excess spoil shall be removed from the site to an approved disposal location and the stockpile location rehabilitated as per other disturbed areas

Seed Mix

Where a site-specific seed mix is not specified, the below table provides a seed mix suitable for use in site rehabilitation or temporary seeding.

Seed Mix Specifications

	Summer Blend (Nov – Feb)	Mid-Season (Mar/Apr & Sep/Oct)	Winter Blend (May – Aug)
Unhulled green couch (Cynodon dactalyon)	**35kg/ha**	**35 kg/ha**	**35 kg/ha**
Hulled green couch (Cynodon dactalyon)	**35 kg/ha**	**35 kg/ha**	**35 kg/ha**
Japanese or Shirohie Millet	**30 kg/ha**	**15 kg/ha**	**0**
Perennial Rye Grass	**0**	**15 kg/ha**	**30 kg/ha**

Hydromulch Specifications

Paper pulp at 2t/ha or wood pulp at 2.5t/ha plus tackifier at 5 to 10% by weight.

Appendix A : Progressive Erosion and Sediment Control Drawings

LEGEND

Stabilised exit

Mulch bund

Sediment Basin - in existing dam location

Sediment trap

Dirty water drain

Dirty water flow direction

Sediment trap 1
Dimensions -
10m(L) x 5m(W) x 0.6m(D)

Sediment trap 2
Dimensions -
10m(L) x 8m(W) x 1m(D)

Sediment trap 3
Dimensions -
10m(L) x 10m(W) x 1.5m(D)

Basin 1
Minimum capacity 2030m3
Spillway: 11m wide - lined with geofab and d50 300mm rock
Note - utilise existing dam during clearing and direct all water into dam

Basin 2
Minimum capacity 1433m3
Spillway: 10m wide - lined with geofab and d50 300mm rock
Note - utilise existing dam during clearing and direct all water into dam

Basin 3
Minimum capacity 2660m3
Spillway: 12m wide - lined with geofab and d50 300mm rock
Note - utilise existing dam during clearing and direct all water into dam

Catchment 1

Catchment 2

Catchment 3

COURTNEY DR

ROAD 01

ROAD 02

ROAD 03

ROAD 04

ROAD 11

GORDON DR

RICHARDSON CR

PATTERSON CT

RANGEVIEW ROAD

LEGEND

EXISTING KERB (INVERT)
EXISTING PROPERTY LINE
EXISTING CONTOURS
FUTURE KERB (INVERT)
FUTURE PROPERTY LINE
PROPOSED KERB (INVERT)
PROPOSED PROPERTY LINE
PROPOSED RETAINING WALL
DESIGN CONTOURS
SITE BOUNDARY
STAGE BOUNDARY

F:\Autocad Client\419 - HB Land\01 - Courtney Drive\Precinct-Stage 01\Engineering Drawings\Current\41901-01-050.dwg, EARTHWORKS SECTION KEY PLAN, 11/08/2023 7:48:45 AM, 1:2

PROJECT NAME

COURTNEY DR
UPPER COOMERA

STAGE 01

RP DESCRIPTION

LOT 188, 189, 190, 191 & 192 ON RP173728
COURTNEY DRIVE
LOCALITY OF UPPER COOMERA
LOCAL AUTHORITY - GOLD COAST CITY COUNCIL

CLIENT

HB Land

NORTH

0 15 30 45 60 75m

Scale 1:1500 - A1 (1:3000 - A3)

REV	DATE	DESCRIPTION	INT
B	14-07-23	RFI AMENDMENTS	EP
A	03-03-23	COUNCIL ISSUE	JB

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BENNETT + BENNETT

DRAWING TITLE

BULK EARTHWORKS
SECTION KEY PLAN

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Urban & Regional Planning
Civil Engineering
Project Coordination

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DESIGNED	RB	DRAWN	EMH
APPROVED	RPEQ 4706	DATE	03-03-23

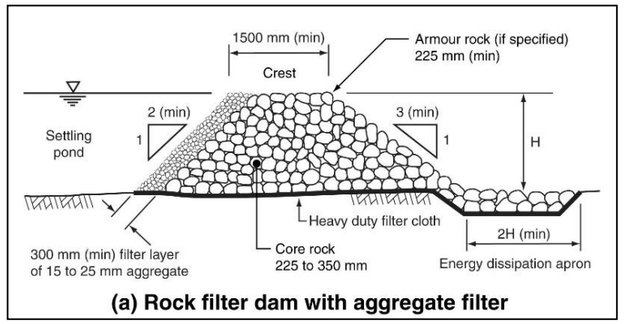
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REV: A

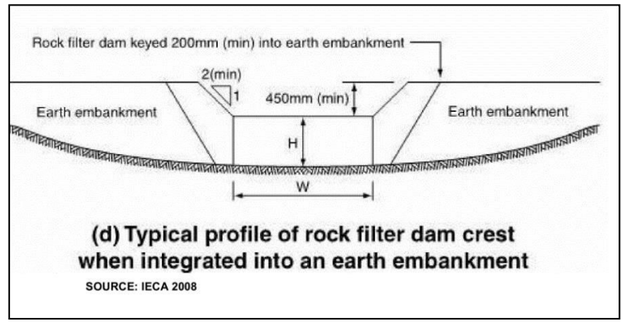
Appendix B : Standard Drawings and Calculations

Excavated Sediment Trap Calculator

Excavated Sediment Trap Calculator									
Chainage		Size only	Size only	Size only	Size only	Size only	Size only	Size only	Size only
Control design life	time	5	5	5	5	5	5	5	5
Max catchment size	m2	20000	15000	10000	7500	5000	2500	1000	500
ToC	Minutes	10.0	9.0	8.0	7.0	6.0	5.0	3.0	3.0
Rainfall	mm/h	143.0	148.0	154.0	161.0	168.0	176.0	194.0	194.0
Runoff	coefficient	1	1	1	1	1	1	1	1
Rational Method	m3/s	0.794	0.617	0.428	0.335	0.233	0.122	0.054	0.027
Particle Size targetted	lookup	0.100	0.100	0.100	0.100	0.100	0.150	0.150	0.15
Surface area	m2/m3/s	**111**	**86**	**60**	**47**	**33**	**8**	**3**	**2**
Volume at 0.6m		67	52	36	28	20	5	2	1



(a) Rock filter dam with aggregate filter

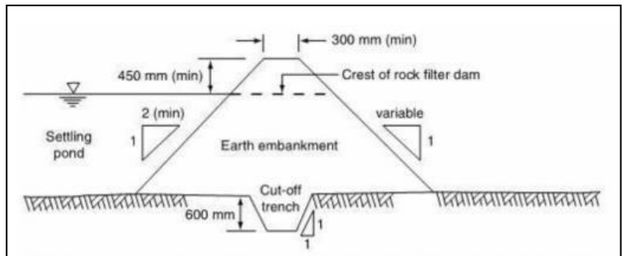


(d) Typical profile of rock filter dam crest when integrated into an earth embankment

SOURCE: IECA 2008

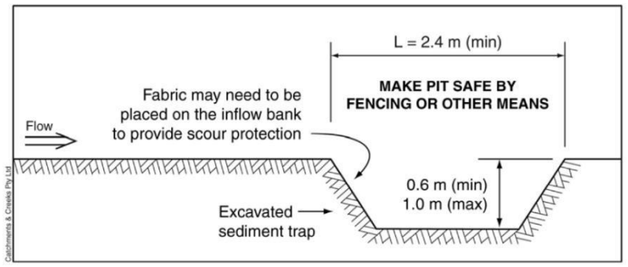
Design standard	Critical sediment size (mm)	Surface area of settling pond per unit discharge ($m^2/m^3/s$) [1]			Allowable through-velocity (m/s)
		10° C [2]	15° C [2]	20° C [2]	
Type 3 sediment trap	0.50	6	5.2	4.6	0.3
	0.20	38	33	29	0.3
	0.15	67	60	52	0.3
Type 2 sediment trap	0.10	150	130	115	0.2
	0.05	600	525	460	0.2
Type 1 sediment trap	0.04	940	820	720	0.2
	0.02	3700	3230	2860	0.2

[1] Pond area is based on a rectangular pond operating with uniform inflow conditions across its width.
[2] Assume a pond temperature the same as the typical rainwater temperature during the time of year when the pond is likely to be operating at capacity.



(c) Typical cross-section of constructed earth abutment

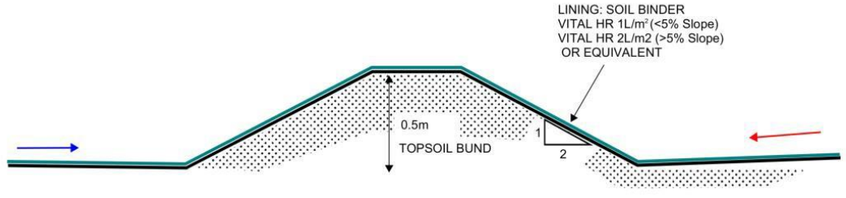
SOURCE: IECA 2008

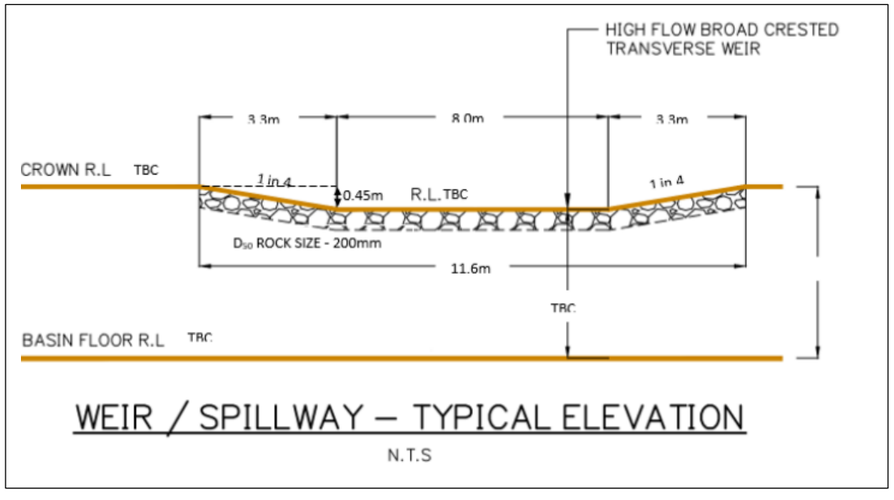


Classification	Minimum particle size	Typical trapped particles
Type 1	< 0.045mm	Clay, silt & sand
Type 2	0.045 – 0.14mm	Silt & sand [1]
Type 3	> 0.14mm	Sand
Supplementary	> 0.14mm	Sand

[1] Technically, silt particles have a grain size of 0.002 to 0.02mm, which means that only Type 1 sediment traps are likely to capture silt-sized particles. However, for general discussion purposes, it can be assumed that Type 2 systems capture a significant proportion of silt-sized particles.

DIVERSION BUND SECTION

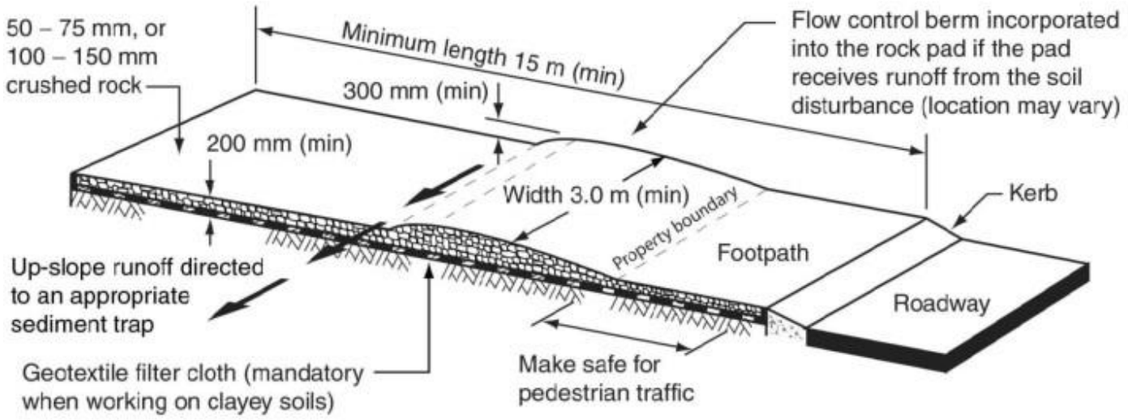




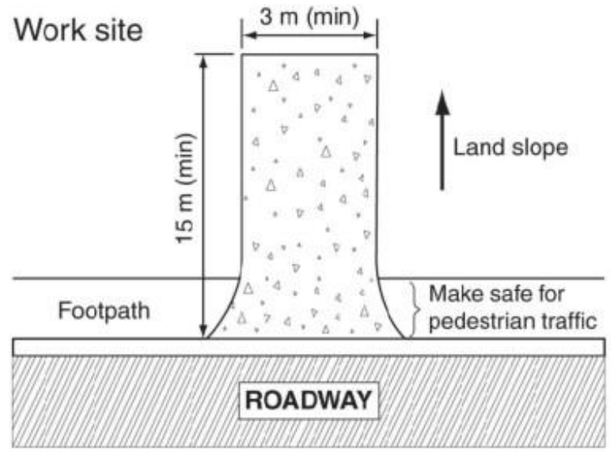
WEIR / SPILLWAY – TYPICAL ELEVATION

N.T.S

Site access Arrangement

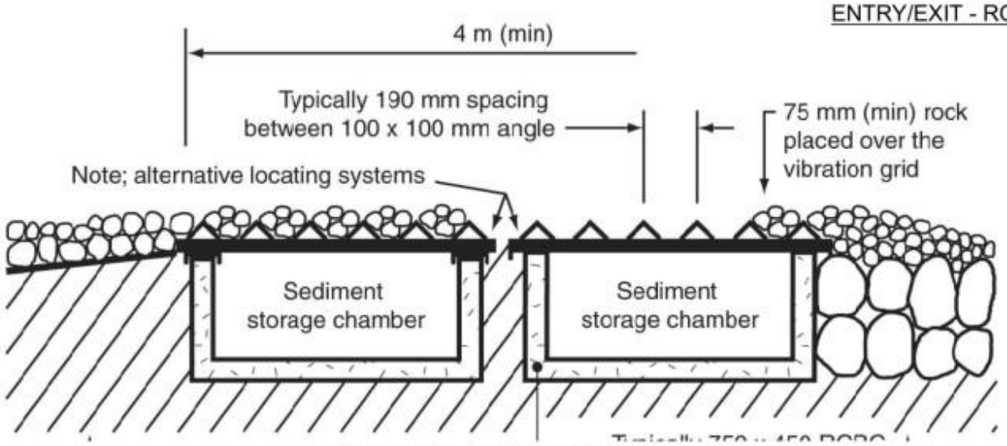


ENTRY/EXIT - ROCK

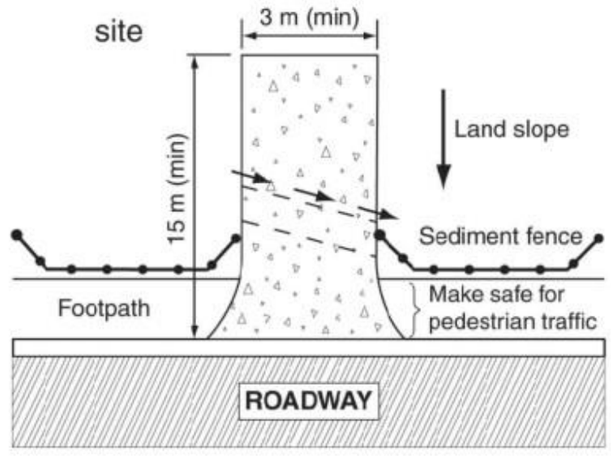


ENTRY/EXIT - ROCK
(SLOPING AWAY FROM ROAD)

ENTRY/EXIT - ROCK



ENTRY/EXIT - VIBRATION GRID



ENTRY/EXIT - ROCK
(SLOPING TOWARD ROAD)

STANDARD DRAWINGS SOURCED FROM CATCHMENT AND CREEKS

EROSION & SEDIMENT CONTROL PLAN

Courtney Drive Estate Stage 1-3, Upper Coomera

Rev: 0

Date: 28/09/23

ESCP No. 001

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CLEAR THE LOCATION FOR THE BANK, CLEARING ONLY THE AREA THAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND EQUIPMENT.

3. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY. DO NOT USE DEBRIS TO BUILD THE BANK.

4. FORM THE BANK FROM THE MATERIAL, AND TO THE DIMENSION SPECIFIED IN THE APPROVED PLANS.

5. IF EARTH IS USED, THEN ENSURE THE SIDES OF THE BANK ARE NO STEEPER THAN A 2:1 (H:V) SLOPE, AND THE COMPLETED BANK MUST BE AT LEAST 500mm HIGH.

6. IF FORMED FROM SANDBAGS, THEN ENSURE THE BAGS ARE TIGHTLY PACKED SUCH THAT WATER LEAKAGE THROUGH THE BAGS IS MINIMISED.

7. CHECK THE BANK ALIGNMENT TO ENSURE POSITIVE DRAINAGE IN THE DESIRED DIRECTION.

8. THE BANK SHOULD BE VEGETATED (TURFED, SEEDED AND MULCHED), OR OTHERWISE STABILISED IMMEDIATELY, UNLESS IT WILL OPERATE FOR LESS THAN 30 DAYS OR IF SIGNIFICANT RAINFALL IS NOT EXPECTED DURING THE LIFE OF THE BANK.

9. ENSURE THE EMBANKMENT DRAINS TO A STABLE OUTLET, AND DOES NOT DISCHARGE TO AN UNSTABLE FILL SLOPE.

MAINTENANCE

1. INSPECT FLOW DIVERSION BANKS AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.

2. INSPECT THE BANK FOR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD. MAKE REPAIRS AS NECESSARY.

3. CHECK THAT FILL MATERIAL OR SEDIMENT HAS NOT PARTIALLY BLOCKED THE DRAINAGE PATH UP-SLOPE OF THE EMBANKMENT. WHERE NECESSARY, REMOVE ANY DEPOSITED MATERIAL TO ALLOW FREE DRAINAGE.

4. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

5. REPAIR ANY PLACES IN THE BANK THAT ARE WEAKENED OR IN RISK OF FAILURE.

REMOVAL

1. WHEN THE SOIL DISTURBANCE ABOVE THE BANK IS FINISHED AND THE AREA IS STABILISED, THE FLOW DIVERSION BANK SHOULD BE REMOVED, UNLESS IT IS TO REMAIN AS A PERMANENT DRAINAGE FEATURE.

2. DISPOSE OF ANY SEDIMENT OR EARTH IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA AND SMOOTH IT OUT IN PREPARATION FOR STABILISATION.

4. STABILISE THE AREA BY GRASSING OR AS SPECIFIED IN THE APPROVED PLAN.

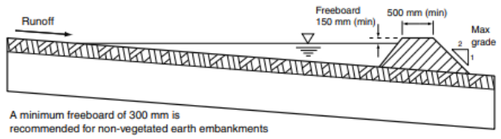


Figure 1 - Typical profile of flow diversion bank formed from earth

Table 1 - Recommended dimensions of flow diversion banks

Parameter	Earth banks	Vegetated banks	Compost berms	Sandbag berms
Height (min)	500 mm	500 mm	300 mm	N/A
Top width (min)	500 mm	500 mm	100 mm	N/A
Base width (min)	2500 mm	2500 mm	600 mm	N/A
Side slope (max)	2:1 (H:V)	2:1 (H:V)	1:1 (H:V)	N/A
Freeboard	300 mm	150 mm	100 mm	50 mm

Drawn:	Date:		
GMW	Dec-09	Flow Diversion Banks	DB-01

Catchments & Creeks Pty Ltd

MATERIALS

ROCK: 150 TO 300mm NOMINAL DIAMETER, HARD, EROSION RESISTANT ROCK. SMALLER ROCK MAY BE USED IF SUITABLE LARGE ROCK IS NOT AVAILABLE.

SANDBAGS: GEOTEXTILE BAGS (WOVEN SYNTHETIC, OR NON-WOVEN BIODEGRADABLE) FILLED WITH CLEAN COARSE SAND, CLEAN AGGREGATE, STRAW OR COMPOST.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. PRIOR TO PLACEMENT OF THE CHECK DAMS, ENSURE THE TYPE AND SIZE OF EACH CHECK DAMS WILL NOT CAUSE A SAFETY HAZARD OR CAUSE WATER TO SPILL OUT OF THE DRAIN.

3. LOCATE THE FIRST CHECK DAM AT THE DOWNSTREAM END OF THE SECTION OF CHANNEL BEING PROTECTED. LOCATE EACH SUCCESSIVE CHECK DAM SUCH THAT THE CREST OF THE IMMEDIATE DOWNSTREAM DAM IS LEVEL WITH THE TOE OF THE CHECK DAM BEING INSTALLED.

4. ENSURE THE CHANNEL SLOPE IS NO STEEPER THAN 10:1 (H:V). OTHERWISE CONSIDER THE USE OF A SUITABLE CHANNEL LINER INSTEAD OF THE CHECK DAMS.

5. CONSTRUCT THE CHECK DAM TO THE DIMENSIONS AND PROFILE SHOWN WITHIN THE APPROVED PLAN.

6. WHERE SPECIFIED, THE CHECK DAMS SHALL BE CONSTRUCTED ON A SHEET OF GEOTEXTILE FABRIC USED AS A DOWNSTREAM SPLASH PAD.

7. EACH CHECK DAM SHALL BE EXTENDED UP THE CHANNEL BANK (WHERE PRACTICABLE) TO AN ELEVATION AT LEAST 150mm ABOVE THE CREST LEVEL OF THE DAM.

MAINTENANCE

1. INSPECT EACH CHECK DAM AND THE DRAINAGE CHANNEL AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.

2. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN ANY OF THE CHECK DAMS, THEN CHECK THE SPACING OF DAMS AND WHERE NECESSARY INSTALL INTERMEDIATE CHECK DAMS OR A SUITABLE CHANNEL LINER.

3. CHECK FOR DISPLACEMENT OF THE CHECK DAMS

4. CHECK FOR SOIL SCOUR AROUND THE ENDS OF EACH CHECK DAM. IF SUCH EROSION IS OCCURRING, CONSIDER EXTENDING THE WIDTH OF THE CHECK DAM TO AVOID SUCH PROBLEMS.

5. IF SEVERE SOIL EROSION OCCURS EITHER UNDER OR AROUND THE CHECK DAMS, THEN SEEK EXPERT ADVICE ON AN ALTERNATIVE TREATMENT MEASURE.

6. REMOVE ANY SEDIMENT ACCUMULATED BY THE CHECK DAMS, UNLESS IT IS INTENDED THAT THIS SEDIMENT WILL REMAIN WITHIN THE CHANNEL.

7. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. WHEN CONSTRUCTION WORK WITHIN THE DRAINAGE AREA ABOVE THE CHECK DAMS HAS BEEN COMPLETED, AND THE DISTURBED AREAS AND THE DRAINAGE CHANNEL ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, ALL TEMPORARY CHECK DAMS MUST BE REMOVED.

2. REMOVE THE CHECK DAMS AND ASSOCIATED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

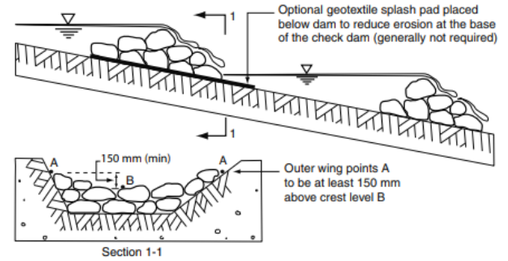


Figure 1 - Layout and profile of check dams (rock check dams shown)

Drawn:	Date:		
GMW	Dec-09	Check Dams	RCD-01

Catchments & Creeks Pty Ltd

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE ALL NECESSARY SOIL TESTING (e.g. SOIL pH, NUTRIENT LEVELS) AND ANALYSIS HAS BEEN COMPLETED, AND REQUIRED SOIL ADJUSTMENTS PERFORMED PRIOR TO PLANTING.

3. CLEAR THE LOCATION FOR THE CHANNEL, CLEARING ONLY WHAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND CONSTRUCTION EQUIPMENT.

4. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY. DO NOT USE DEBRIS TO BUILD ANY ASSOCIATED EMBANKMENTS.

5. EXCAVATE THE DIVERSION CHANNEL TO THE SPECIFIED SHAPE, ELEVATION AND GRADIENT. THE SIDES OF THE CHANNEL SHOULD BE NO STEEPER THAN A 2:1 (H:V) IF CONSTRUCTED IN EARTH, UNLESS SPECIFICALLY DIRECTED WITHIN THE APPROVED PLANS.

6. STABILISE THE CHANNEL AND BANKS IMMEDIATELY UNLESS IT WILL OPERATE FOR LESS THAN 30 DAYS. IN EITHER CASE, TEMPORARY EROSION PROTECTION (MATTING, ROCK, ETC.) WILL BE REQUIRED AS SPECIFIED WITHIN THE APPROVED PLANS OR AS DIRECTED.

7. ENSURE THE CHANNEL DISCHARGES TO A STABLE AREA.

ADDITIONAL REQUIREMENTS FOR TURF PLACEMENT:

1. TURF SHOULD BE USED WITHIN 12 HOURS OF DELIVERY, OTHERWISE ENSURE THE TURF IS STORED IN CONDITIONS APPROPRIATE FOR THE WEATHER CONDITIONS (e.g. A SHADED AREA).

2. MOISTENING THE TURF AFTER IT IS UNROLLED WILL HELP MAINTAIN ITS VIABILITY.

3. TURF SHOULD BE LAID ON A MINIMUM 75mm BED OF ADEQUATELY FERTILISED TOPSOIL. RAKE THE SOIL SURFACE TO BREAK THE CRUST JUST BEFORE LAYING THE TURF.

4. DURING THE WARMER MONTHS, LIGHTLY IRRIGATE THE SOIL IMMEDIATELY BEFORE LAYING THE TURF.

5. ENSURE THE TURF IS NOT LAID ON GRAVEL, HEAVILY COMPACTED SOILS, OR SOILS THAT HAVE BEEN RECENTLY TREATED WITH HERBICIDES.

6. ENSURE THE TURF EXTENDS UP THE SIDES OF THE DRAIN AT LEAST 100mm ABOVE THE ELEVATION OF THE CHANNEL INVERT, OR AT LEAST TO A SUFFICIENT ELEVATION TO FULLY CONTAIN EXPECTED CHANNEL FLOW.

7. ON CHANNEL GRADIENTS OF 3:1(H:V) OR STEEPER, OR IN SITUATIONS WHERE HIGH FLOW VELOCITIES (i.e. VELOCITY >1.5m/s) ARE LIKELY WITHIN THE FIRST TWO WEEK FOLLOWING PLACEMENT, SECURE THE INDIVIDUAL TURF STRIPS WITH WOODEN OR PLASTIC PEGS.

8. ENSURE THAT INTIMATE CONTACT IS ACHIEVED AND MAINTAINED BETWEEN THE TURF AND THE SOIL SUCH THAT SEEPAGE FLOW BENEATH THE TURF IS AVOIDED.

9. WATER UNTIL THE SOIL IS WET 100mm BELOW THE TURF. THEREAFTER, WATERING SHOULD BE SUFFICIENT TO MAINTAIN AND PROMOTE HEALTHY GROWTH

MAINTENANCE

1. DURING THE SITE'S CONSTRUCTION PERIOD, INSPECT THE DIVERSION CHANNEL WEEKLY AND AFTER ANY INCREASE IN FLOWS WITHIN THE CHANNEL. REPAIR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD.

2. ENSURE FILL MATERIAL OR SEDIMENT IS NOT PARTIALLY BLOCKING THE CHANNEL. WHERE NECESSARY, REMOVE ANY DEPOSITED MATERIAL TO ALLOW FREE DRAINAGE.

3. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. WHEN THE CONSTRUCTION WORK ABOVE A TEMPORARY DIVERSION CHANNEL IS FINISHED AND THE AREA IS STABILISED, THE AREA SHOULD BE APPROPRIATELY REHABILITATED.

2. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA AND SMOOTH IT OUT IN PREPARATION FOR STABILISATION.

4. STABILISE THE AREA AS SPECIFIED IN THE APPROVED PLAN.

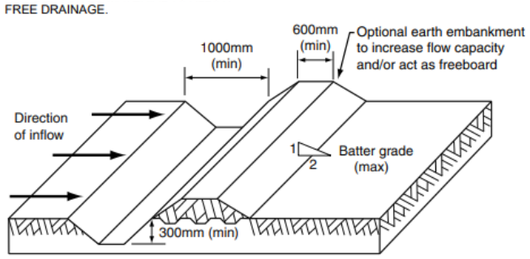


Figure 1 - Typical profile of diversion channel with bank

Drawn:	Date:		
GMW	Dec-09	Diversion Channels	DC-01

Catchments & Creeks Pty Ltd

MATERIALS

POLYACRYLAMIDE:
(i) CHOICE OF POLYACRYLAMIDE SHOULD BE BASED ON THE MOST ENVIRONMENTALLY SAFE, ANIONIC PRODUCT AVAILABLE. CATIONIC POLYACRYLAMIDE SHALL NOT BE USED.

(ii) POLYACRYLAMIDE USED FOR EROSION AND SEDIMENT CONTROL SHALL BE WATER SOLUBLE, LINEAR, OR NON-CROSS LINKED.

(iii) GRANULAR POLYACRYLAMIDE MUST BE STORED OUT OF THE SUN WHILE NOT IN USE.

APPLICATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND APPLICATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF APPLICATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. POLYACRYLAMIDE, COMBINED WITH WATER, IS VERY SLIPPER AND CAN REPRESENT A SAFETY HAZARD. APPROPRIATE MANAGEMENT OF ANY SAFETY HAZARD MUST BE ACHIEVED.

3. ENSURE ALL POLYACRYLAMIDE ARE USED FOR PURPOSES AND AT APPLICATION RATES IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

4. POLYACRYLAMIDE MUST NOT BE ADDED TO WATER DISCHARGING DIRECTLY FROM THE SITE.

5. PRE-DISSOLVE THE DRY, GRANULAR POLYACRYLAMIDE INTO A CONCENTRATED SOLUTION OVERNIGHT OR SEVERAL HOURS BEFORE USAGE.

6. PRIOR TO APPLICATION, ENSURE SUPPLEMENTARY EROSION AND SEDIMENT CONTROL PRACTICES COMPLY WITH BEST PRACTICE.

7. PRE-FILL A TANK APPROXIMATELY 1/8 FULL WITH WATER PRIOR TO INPUT OF THE PRE-PREPARED, CONCENTRATED POLYACRYLAMIDE SOLUTION. CONTINUE TO FILL THE TANK WITH THE REQUIRED WATER VOLUME. THE WATER MUST HAVE LOW TURBIDITY IN THE RANGE OF 20 NTU OR LESS.

8. APPLY THE MIXTURE UNTIL THE SOIL SURFACE IS UNIFORMLY AND COMPLETELY WETTED.

9. ALL REASONABLE EFFORTS SHOULD BE TAKEN TO APPLY POLYACRYLAMIDE SOLUTION TO THE SOIL WHILE THE SOIL IS IN A 'DRY' CONDITION.

10. DURING APPLICATION, ALL REASONABLE EFFORTS MUST BE TAKEN TO AVOID SPRAY ONTO ROADS, PATHWAYS, DRAINAGE CHANNELS NOT INTENDED FOR APPLICATION, AND EXISTING VEGETATION.

MAINTENANCE

1. INSPECT THE TREATED SURFACE PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORMS OR OTHERWISE AT FORTNIGHTLY INTERVALS.

2. REAPPLY WITHIN 48 HOURS AFTER THE TREATED AREAS HAS BEEN DISTURBED BY EARTHMOVING MACHINERY IF EROSION CONTROL IS REQUIRED.

3. REAPPLY AS NECESSARY ON DAMAGED AREAS.

4. REAPPLICATION IS GENERALLY NOT REQUIRED UNLESS THE TREATED AREA IS DISTURBED, A PERIOD OF 60-DAYS HAS PASSED, OR UNLESS ACCEPTABLE TURBIDITY LEVELS ARE EXCEEDED. IF THE TREATED AREA HAS BEEN MULCHED, THEN REAPPLICATION MAY NOT BE REQUIRED FOR SEVERAL MONTHS.

Drawn:	Date:		
GMW	Dec-09	Polyacrylamide	PAM-01

APPENDIX H

DUST MANAGEMENT PLAN



DUST MANAGEMENT PLAN

PROJECT: COURTNEY DRIVE, UPPER COOMERA, STAGE 2

DMP SUB PLAN AUTHORISATION AND CONTROL

The Dust Management Plan (DMP) is authorised internally by the Project Manager or delegate and accepted by the Client.

REVISION

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

PROJECT DOCUMENT REVISION HISTORY

Rev No.	Rev. Date	Sections Revised	Revision Description	Prepared by	Checked by	Approved by
0	8/03/2023		Document preparation	M Jabbour	M Williams	
1						
2						
3						

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GLOSSARY / ABBREVIATIONS

AQ	Air Quality
AS	Australian Standards
DMP	Dust Management Plan
CEMP	Construction Environmental Management Plan
ERSED	Erosion and sedimentation
ESCP	Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statements
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measures
Project, the	Courtney Drive, Upper Coomera, Stage 2

1 INTRODUCTION

1.1 CONTEXT

This Dust Management Plan (DMP or the Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Urban Development on Courtney Drive, Upper Coomera Stage 2 (the Project) to be constructed by Winslow.

This plan has been developed to comply with the Development Approval conditions and to provide strategies for dust control during activities on site to ensure dust levels are maintained to an acceptable level that meets legislative requirements.

1.2 SCOPE

This plan addresses the management of emissions to the atmosphere that may be caused by Project activities and that have the potential to adversely affect the environment or community by affecting air quality. It describes how Winslow proposes to manage and protect air quality and address requirements of Courtney Drive Stage 2 Estates Planning Approval Conditions and requirements and applicable legislation.

Activities conducted on the project that have the potential to impact air quality are provided below.

Table 1: Air Quality Hazards and Risks

Project Activity	Environmental Hazard	Environmental Risk
Vehicle movements	Generation of dust	Nuisance to community[1]
Vegetation clearing	Generation of dust and pollens	Nuisance to community[1]
Wind erosion of exposed areas	Generation of dust	Nuisance to community[1]
Stockpiling of material	Generation of dust	Nuisance to community[1]
Temporary access tracks	Generation of dust	Nuisance to community[1]
Bulk earthworks (cut and fill)	Generation of dust	Nuisance to community[1]
Air emissions, other than dust including exhaust fumes, odours/gases from construction activities	Generation of fumes and/or odours	Nuisance to community[1]

1. The generation of dust can have nuisance effects on the community which may include (but not limited to) aesthetic effects from visible airborne dust plumes, residences requiring additional cleaning, increased maintenance of air filters, potential health risks, impacts on water quality or vegetation health, residential living areas such as pools, air conditioning living etc.
2. Affecting flora with dust on leaves etc.

This plan does not address workplace respiratory dust which is covered through implementation of the Project's Health and Safety Management Plan.

During construction the following activities would potentially result in air quality impacts:

- vegetation clearing
- stripping and stockpiling topsoil
- windblown dust from exposed surfaces e.g. stockpiles, roads etc.
- earthworks

- road construction
- transport and handling of soils and materials
- vehicular dust from traffic movements on unpaved roads
- use of construction vehicles, generating exhaust fumes.

2 LEGISLATION

The Australian Standard (ISO 14001:2015, 6.1.3) requires the Company to:

a) determine and have access to the compliance obligations related to its environmental aspects.
b) determine how these compliance obligations apply to the organisation.
c) take these compliance obligations into account when establishing, implementing, maintaining and continually improving its environmental management system."

The constructing contractor understands the importance of meeting, and where practicable, exceeding, its regulatory obligations. All required compliance obligations are available electronically at site and displayed on the site noticeboard when required.

Winslow has developed a site-specific CEMP and relevant environmental procedure to comply with legislation outlined in the CEMP.

2.1 SPECIFIC CONDITIONS OF LOCAL, STATE AND COMMONWEALTH LEGISLATION

Conditions of local, state and Commonwealth laws, regulations and protection policies that apply specific criteria to emissions to the atmosphere relevant to the Project include:

Table 2: Air Quality Legislation

Legislation Title
Environmental Protection Act 1994
Environmental Protection (Air) Policy 2019

3 PROJECT TARGETS

The Project's risk management processes and the potential impacts to the community, the following air quality targets have been set for the Project. Any deviance from the targets will result in Project management immediately implementing corrective actions.

Table 3: Air Quality Project Targets

Key Performance Indicator	Target	Time Frame	Accountability
Number of non-compliant monitoring results	Zero	At all times	Project Manager
Number of actions taken by regulators and/or client	Zero	At all times	Project Manager

4 CONTROLS USED TO MANAGE AIR QUALITY

Controls that are adequate to ensure compliance and reduce risk to as low as reasonably practical (ALARP) are implemented before any relevant work commences. Elimination of a hazard is the preferred method of control, followed by engineering and then administrative controls. Controls used on the Project include:

Table 4: Air Quality Controls

Control	Accountability
Minimising the areas in which vegetation has been removed or disturbed	Site Engineer/Supervisor
Progressively rehabilitating or grassing areas as soon as they become available	Project Engineer
During high winds (i.e. greater than 25 km/hr) a visual inspection of the site will take place and the dust situation will be assessed (i.e. dust risks to residents/road traffic). Possible controls are water cart or alter operating procedures.	Environment Manager / Superintendent
Applying dust suppressant (water) to areas that present a high risk for dust generation at a frequency sufficient to ensure contractual and compliance requirements are achieved and the community is not adversely affected	Site Engineer/ Supervisor
Establishing properly constructed rumble pads (as required) at all gates, for the ingress and egress of all vehicles	Project Engineer
Establishing traffic speeds in order to minimise dust generation and/or implement dust suppression measures in active construction areas	Superintendent
Assessing exhaust emissions as part of plant inspections, with excessive emissions resulting in the plant being removed from use	Plant Manager/Supervisor
Ensuring that burning-off does not occur on the Project	Superintendent
Plant and machinery will be switched off when not in use. Plant will be fitted with emission control devices complying with Australian Design Standards. Construction plant, vehicles and equipment will be maintained in good working condition to limit impacts on air quality	Supervisor
The use of alternative fuels and power sources for construction plant and equipment will be investigated and implemented, where appropriate.	Environment Manager

5 ENVIRONMENTAL ASPECTS AND IMPACTS

5.1 CONSTRUCTION ACTIVITIES

Emissions to the atmosphere during construction that could result in adverse impacts to air quality are typically divided into two categories:

- Dust and particulates.
- Gaseous.

Key aspects of the Project that could result in dust emissions include:

- General earthworks particularly during site establishment.
- Vegetation clearing.
- Bulk earthworks.
- Drilling and blasting.
- Operating, crushing and screening.
- Topsoil / material handling including stockpiling, material loading and material haulage.
- Vehicular movements over unpaved surface (including unsealed access roads).
- Wind erosion of exposed areas and temporary stockpiles.
- Tracking of dirt onto roads.
- Liming operations.
- Mulching/chipping.
- Concrete cutting.

Air emissions, other than dust, which may be generated by construction activities include:

- Vehicle and plant exhaust emissions, which may be excessive if vehicles and plant are poorly maintained.
- Herbicide and pesticide spraying.
- Odours/gases released during:
  - Excavations of organic or contaminated materials
  - During sealing works
  - Waste storage.

5.2 FACTORS LIKELY TO AFFECT DUST GENERATION AND IMPACTS

In addition to the inherent risks of specific construction activities creating the potential to generate dust, a number of other environment factors also affect the likelihood of dust emissions. These include:

- Wind direction – determines whether dust and suspended particles are transported in the direction of the sensitive receivers.
- Wind speed – governs the potential suspension and drift resistance of particles.
- Soil type – more erodible soil types have an increased soil or dust erosion potential.
- Soil moisture – increased soil moisture reduces soil or dust erosion potential.
- Rainfall or dew – rainfall or heavy dew that wets the surface of the soil and reduces the risk of dust generation.
- Extent of vegetation cover – vegetation assists in stabilising soils and reduces the ability for dust erosion to occur.

5.3 IMPACTS

The potential for impacts on air quality will depend on a number of factors. Primarily impacts will be dependent on the nature, extent and magnitude of construction activities and their interaction with the natural environment. Potential impacts attributable to construction might include:

- Deposition of dust on surfaces where it may cause damage and/or lead to a need for increased cleaning or repair.
- Aesthetic effects that arise from visible airborne dust plumes and from deposits of dust on surfaces.
- Need for increased maintenance of air filtering systems (eg air conditioners etc).
- Potential adverse health effects including eye, nose and throat irritation from excessive inhalation of fine particles.
- Impacts on water quality and/or vegetation health from dust deposition.
- Impacts on residential sensitive receivers, including impacts on living areas, swimming pools and general amenities.
- Complaints from the public relating to dust or odours.
- Dust deposition impacts on threatened flora species or habitat for threated fauna species.
- Dust deposition impacts on sensitive agricultural receivers, including sugar cane and horticulture farms.
- Dust contamination of water tanks.

Section 5 provides a suite of mitigation measures that will be implemented to avoid or minimise dust impacts.

6 ENVIRONMENTAL CONTROL MEASURES

A range of environmental requirements and control measures will be identified in the various environmental documents, Assessments and Conditions of Approval. These specific measures and requirements to address impacts on air quality are incorporated into Table 5.

Table 5 Air quality management and mitigation measures

ID	Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
GENERAL					
AQ1	Training will be provided to all project personnel, including relevant sub-contractors on sound air quality control practices and the requirements from this plan through inductions, toolboxes and targeted training.		Pre-construction Construction	Environmental Site Representative	Good practice
AQ2	Air quality control measures from this plan will be included in relevant Environmental Work Method Statements (EWMS) and/or Erosion and Sediment Control Plans (ESCP).		Pre-construction / Construction	Environmental Site Representative	Good practice
AQ3	Vegetation clearing will be staged where possible to minimise the area and time that surfaces are exposed.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ4	Exposed surfaces with no scheduled work for two weeks will be treated to minimise dust generation. Exposed surfaces will be stabilised progressively using the most practical site specific methods, such as watering and geo-fabrics for short term exposure and emulsion spray, spray grass, soil compaction and revegetation for longer term exposed areas or final finishes.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ5	Construction activities will be modified, reduced or controlled during high or unfavourable wind conditions if they have a potential to increase off-site dust generation.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ6	Control measures including water carts, sprinklers, sprays, dust screens or the application of geo-binding agents will be utilised where applicable to control dust emissions. The frequency of use will be modified accommodate prevailing conditions. Dust		Construction	Supervisor Project Engineer Foreman Environmental Site Representative	Good practice

ID	Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
	control equipment will be maintained to ensure its operability.				
AQ7	Erosion control structures will be checked regularly for build-up of silt and other materials to ensure deposits do not become a dust source.		Construction	Supervisor Foreman Environmental Site Representative	Good practice
AQ8	Waste will be segregated and collected on a regular basis to ensure odours associated with waste do not become an issue.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ9	The application of pesticides and herbicides will be modified, reduced or controlled during high or unfavourable wind conditions where wind can carry pesticides outside of the defined treatment area.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ10	Stockpiles will be located in accordance with the ESCP. Control measures including water carts, sprinklers, sprays, dust screens or the application of geo-binding agents will be utilised where applicable to control dust emissions. A suitable cover crop or provision of other covering over topsoil stockpiles will be established where stockpiles are in place for longer than 4 weeks.		Construction	Supervisor Project Engineer Foreman Environmental Site Representative	Good practice
AQ11	If required shade cloths will be installed around low growing threatened species, in situ populations and threatened invertebrate habitat to provide dust protection and maintain microclimate.		Construction	Supervisor Project Engineer Foreman Environmental Site Representative	Good practice
AQ12	There will be no burning off of waste.		Construction	Foreman	Good practice
AQ13	Stormwater, recycled water or other water sources shall be used, where feasible and reasonable, in preference to potable water for construction activities, including concrete mixing and dust control.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ14	Disturbed areas will be progressively rehabilitated as soon as practical.		Construction/ Post-construction	Supervisor Project Engineer Foreman	Good practice

ID	Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
VEHICLE MOVEMENT AND MATERIAL STORAGE					
AQ15	Compounds, ancillary facilities, administration access roads and standing areas will be hard surfaced as soon as possible.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ16	Measures implemented to minimise dust, soil or mud from being deposited from vehicles on public roads. This will be achieved by implementing mitigation measures such as rumble grids and large aggregate at entry/exit points. In the event of any spillage or tracking, the spilt material will be removed within 24 hours. Management measures should include: • Watering of unsealed haul roads, as required • Visual checks of exhaust emissions. Vehicle movements on unsealed roads is to be minimised i.e. taking alternate routes, car-pooling, avoiding un-necessary trips. Unsealed roads will be avoided following rain events (where possible).		Construction	Supervisor Foreman Environmental Site Representative	Good practice
AQ17	Hardstand areas and surrounding public roads will be cleaned, as required, using methods including brooms, bobcat attachments or street sweepers.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ18	Vehicle movement will be confined to designated haul roads and areas. These roads will have speed limits of 40km/h in order to reduce dust generation. Reduced speed limit may be implemented where dust generation persists		Construction	Supervisor Project Engineer Foreman	Good practice
AQ19	All loaded haulage trucks will be covered where there is a risk of release of dust or other materials and at all times on public roads.		Construction	Foreman	Good practice

ID	Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
PLANT AND EQUIPMENT					
AQ20	Haul trucks and plant equipment will be switched off when not in operation for periods of more than 30 minutes. No Idling policy will be implemented (where possible)		Construction	Foreman Operators	Good practice
AQ21	Engines of plant parked next to residents will be switched off when not in operation. In the event that stationary equipment (i.e. generators, etc) is required, the location and orientation for this equipment must be considered in relation to any surrounding sensitive receptors.		Construction	Foreman Operators	Good practice
AQ22	Exhaust systems of construction plant, vehicles and machinery will be maintained in accordance with manufacturer's specifications to ensure that emissions do not exceed regulations. Periodic visual checks will be undertaken to ensure ongoing compliance, typically weekly.		Construction	Supervisor Project Engineer Foreman Operators	Good practice
AQ23	Any plant, equipment or machinery will be immediately switched off should there be visible signs of smoke emissions emitting from equipment/machinery.		Construction	Foreman Operators	Good practice
AQ26	Dust suppression systems will be installed and used on crushing and screening plants and mulching equipment to minimise generation of dust from these activities.		Construction	Supervisor Project Engineer Foreman	Good practice
INSPECTION, MONITORING AND RECORDS					
AQ27	Public roads will be inspected each day at main entry and exit points to and from areas where construction activities are taking place and compound. Material tracked onto the road pavement will be removed in accordance with AQ16.		Construction	Supervisor Project Engineer Foreman	Good practice
AQ28	Weather forecast will be reviewed on a daily basis and appropriate measures implemented where		Construction	Supervisor Project Engineer Foreman	Good practice

ID	Measure / Requirement	Resources needed	When to implement	Responsibility	Reference
	unfavourable weather conditions (dry weather, wind speed>10m/s) are anticipated. Measures to be implemented during unfavourable weather conditions are outlined in AQ5 and AQ9.			Environmental Site Representative	
AQ29	Dust control and operational procedures will be reviewed and modified if results exceed the air quality criteria and are attributable to construction activities.		Construction	Supervisor Project Engineer Environmental Site Representative	Good practice
AQ30	Water captured in excavations will be used for construction or dust suppression.		Construction	Supervisor Project Engineer Foreman	Good practice

7 COMPLIANCE MANAGEMENT

Winslow will manage the environmental performance and compliance of the Courtney Drive Urban Estate, Stage 2 by ensuring ongoing awareness training is delivered to project personnel and through independent inspections and audits. Winslow will be required to complete their own environmental inspections (including any sub-contractors works) and report outcomes, to provide evidence of the works compliance with legislative requirements, conditions of approval and standards and guidelines.

7.1 ROLES AND RESPONSIBILITIES

The organisational structure and overall roles and responsibilities for Winslow are outlined in the project CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 5 of this Plan.

7.2 TRAINING

All employees, contractors and subcontractors working on site will undergo site induction training relating to air quality management issues. The induction training will address elements related to air quality management including:

- Existence and requirements of this sub-plan.
- Relevant legislation.
- DA conditions (e.g. specifically dust management competency and maintenance of plant and equipment conditions)
- Roles and responsibilities for air quality management.
- Air quality mitigation and management measures.
- Procedure to be implemented in the event of an incident (eg release of dust or gaseous emissions from site).

Targeted training in the form of toolbox talks and ongoing awareness training will also be provided to personnel with a key role in air quality management. Examples of training topics include:

- ERSED control installation methodology.
- Planning and preparedness for high wind events / dust risk periods.
- Lessons learnt from dusty periods, incidents and other event e.g. low rainfall/high wind.

Further details regarding staff induction and t raining are outlined in the project CEMP.

8 MONITORING

Air quality monitoring is performed that complies with legal and contractual requirements and which is sufficient to identify potential non-compliances before they occur. Where monitoring determines non-compliance to be a risk, work practices are altered and/or additional controls are implemented immediately.

Monitoring and analysis of data will be carried out by competent personnel. Training records will be maintained.

Visual impacts during construction would generally be associated with:

- Road embankment construction
- Plant and equipment along the alignment
- Vegetation removal
- Establishing the site compound and stockpile sites.

Monitoring for the Courtney Drive Urban Estate, Stage 2 is to be conducted through:

- Daily visual monitoring for dust

8.1.1 METEOROLOGICAL MONITORING

The weekly weather will be distributed to the project team and the predicted wind speed will be accessed in the weekly weather reports. The project team will be advised if winds of greater than 25 km /hour are predicted, high dust generating operations may be rescheduled if required.

Adequate meteorological measurements are to be made to enable correct interpretation of monitoring data for the assessment of compliance and to identify potential non-compliances. The sources of these data are:

Table 6: Air Quality Meteorological Monitoring

Location	Air Quality Parameter	Equipment Type	Frequency
Bureau of Meteorology weather forecasts for Coomera 7 day forecast	Monitor for wind expected speeds greater than 25 km/hr	Bureau of Meteorology weather forecasts	Weekly

8.2 INSPECTION

Regular inspections will be undertaken during construction. Inspections will include, but not be limited to:

- Winslow supervisory inspections on a daily basis and environmental site representative weekly inspections.
- Observations to be recorded by the Winslow Site Supervisor will include:
    - Time, date and general direction of any event when significant dust is observed leaving the project area with the potential to impact nearby sensitive receivers (including residents and traffic) will be logged in the daily diary
    - Time, date and general direction of any external dust sources will be logged in the daily diary

Appropriate mitigation measures will be implemented to facilitate a proactive approach to the management of dust on site. These mitigation measures include water carts continuously providing dust suppression across the site.

8.2.1 INCIDENT RESPONSE AND CONTINGENCY MEASURES

Response to incidents will be undertaken as described Winslow CEMP.

If visual monitoring undertaken by Winslow indicates that mitigation measures are not fully effective or if dust complaints are received during the construction activities. Winslow will notify their client and halt works to implement additional measures to mitigate the dust issues. Winslow will determine if additional air / dust mitigation measures (e.g. additional water carts or site stabilisation such as soil binder or temporary cover crops) are needed and amend this DMP accordingly.

8.3 AUDITING

Audits will be undertaken to assess the effectiveness of environmental controls, compliance with this plan and other relevant approvals, licenses and guidelines.

9 REVIEW AND IMPROVEMENT

9.1 CONTINUOUS IMPROVEMENT

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance.
- Determine the cause or causes of non-conformances and deficiencies.
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies.
- Verify the effectiveness of the corrective and preventative actions.
- Document any changes in procedures resulting from process improvement.
- Make comparisons with objectives and targets.

APPENDIX I

HVNL & HAULAGE MANAGEMENT PLAN

HVNL & HAULAGE MANAGEMENT PLAN

Project Name: Stage 2, Courtney Drive, Upper Coomera

Contract Number: 41901-01

Initial Date: 12th March 2024

WINSLOW CONSTRUCTORS

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HVNL & HAULAGE MANAGEMENT PLAN

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13		**Heavy Vehicle Divers Code of Conduct**
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16		**Legislative Changes to HVNL**
		Chain of Responsibility Policy

Introduction

1.1 Scope

This Plan Applies for Heavy Vehicle National Law (NVNL) CoR compliance.

Applicable companies are:
WINSLOW CONSTRUCTORS PTY TD. ABN: 73 006 581 764

1.2 General

This document outlines the requirements to manage the risks and legal obligations, or chain of responsibility, outlined in the Heavy Vehicle National Law (HVNL) and Regulations.
The Chain of Responsibility requires all parties involved in the supply chain, even if they have no direct role in loading or operating a heavy vehicle, to share the responsibility for complying with this legislation.
Any party who has control in a transport operation can be held responsible and may be made legally liable for a breach of the HVNL. This includes corporate entities, directors, partners and managers who are accountable for the persons under their control.
The HVNL is overseen by the National Heavy Vehicle Regulator (NHVR). State or Territory Police Officers as well as authorised officers, are appointed to enforce offences under the HVNL.
The HVNL is supported by four (4), Heavy Vehicle National Regulations (HVNRs):

- Heavy Vehicle (Fatigue Management) National Regulation.
- Heavy Vehicle (General) National Regulation.
- Heavy Vehicle (Mass, Dimension and Loading) National Regulation.
- Heavy Vehicle (Vehicle Standards) National Regulation.

The heavy vehicle laws apply to heavy vehicles over 4.5 tonnes gross vehicle mass (GVM) and fatigue-regulated heavy vehicles. It does not apply to heavy vehicle activities on private roads or work areas that are not accessible to the public, however hours of work in these areas remain applicable to the calculation of working hours for the management of fatigue.

1.3 Aim

Ensuring compliance with the Heavy Vehicle National Laws (HVNLs). Staff should ensure that they become familiar with this document and all Procedures and Work Instructions relating to Chain of Responsibility and the HVNL.

1.4 Target Audience

This Knowledge document is aimed at all persons with a duty under the HVNLs – i.e. those who plan, schedule, manage or supervise work activities associated with heavy vehicle loading, unloading and transportation.

1.5 Key Hazardous Events

Work activities associated with heavy vehicle loading, unloading and transportation has the potential for the following hazardous events:

- Heavy vehicle accident due to driver fatigue or speed.
- Vehicle overload (mass, dimension, stability), causing accident on public road/s.
- Poor vehicle maintenance causing accident on public road/s.

2. Common Activities Associated with Chain of responsibility for Winslow

- Transportation of plant and equipment to and from site.
- Loading/Unloading of Heavy Vehicles.
- Scheduling operation. and
- Vehicle Maintenance.

3. Roles and Responsibilities

Under compliance and enforcement provisions, everyone in the supply chain has a duty to ensure breaches of road transport laws do not occur. All parties in the supply chain need to ensure that their actions or inactions do not contribute to or encourage breaches of road transport laws. In addition to the above there is also a duty of care to ensure the safety of the supply chain and road user personnel who can influence or control transport-related activities, whether through planning, ordering, scheduling, managing, or supervising work activities associated with heavy vehicle loading, unloading, and transportation, are a party to the Chain of Responsibility.

These personnel include.

- Area Managers and Supervisors
- Team Leaders
- Schedulers
- Persons loading/unloading heavy vehicles
- Drivers directly employed by Winslow
- Plant operators
- Subcontractors
- Suppliers

The responsible personnel in the supply chain are those who undertake the following roles in their work.

Employer – A person who engages someone to drive a heavy vehicle

Prime Contractor – A person who engages a driver to drive the vehicle under a contract for services (e.g. A business engaging a subcontractor to transport goods)

Operator – A person who operates or manages the business that is dispatching goods by a heavy vehicle (Haulage Contractors)

Scheduler – A person who schedules transportation by heavy vehicle.

Loading Manager/Supervisor – A person who supervises/manages or controls the loading or unloading of goods into heavy vehicles.

Loader/Unloader – A person who loads/unloads goods to/from the heavy vehicle

Packer – The person who packs goods into a heavy vehicle

Dispatcher – The person who dispatches goods for deliver by heavy vehicle

Driver – A driver of a heavy vehicle

Receiver – The person who is responsible for ordering or accepting the delivery by heavy vehicle

Consignor – The person engages an operator of the vehicle, either directly or indirectly or through an agent or other intermediary to transport the goods by road

Consignee – a person who has consented to or identified to receive the goods being transported and receives goods

3.1 Area Managers

A duty to ensure as far as reasonably practicable, the safety of the party's transport activities relating to the vehicle (Primary Duty)

- Exercise due diligence
- Ensuring that everything reasonably practicable is done to ensure that drivers do not work while impaired by fatigue or drive in breach of their work or rest options.
- Ensuring that rosters will not contribute to fatigue breaches.
- Ensuring that drivers are effectively trained and competent.
- Ensure that drivers are aware of the mass and dimension limits of their trucks.
- Ensure that plant is compliant with the Heavy Vehicle Standards and has a maintenance schedule.

- Ensure Management of non-conformances in accordance with company policies. and
- Ensure regular executive reporting on all HVNL issues to enable due diligence is exercised.

3.2 Maintenance Supervisor

- Ensure Heavy Vehicles are fitted with speed limiters where applicable.
- Ensure Plant complies with Heavy Vehicle Standards.
- Ensure that plant reflects prestart conditions
- Ensure Plant is regularly serviced. and
- Ensure that Plant has no unauthorised modifications
- Ensure vehicles and plant are kept in good condition
- Manage vehicle registers and maintenance requirements
- Ensure that Heavy Vehicles and Plant are registered.
- Ensure that all insurances are current

3.3 Operations Managers, Supervisors and Coordinators

- Set realistic timelines.
- Ensuring that everything reasonably practicable is done to ensure that drivers do not work while impaired by fatigue or drive in breach of their work or rest options.
- Ensuring that rosters and demands will not contribute to fatigue, Mass, Dimension, Speed, load restraint breaches.
- Ensure that delays are communicated to drivers.
- Manage day to day operations. and
- Communicate with clients in relation to daily requirements
- Ensure that employees are competent
- Ensure that employees are onboarded

3.4 Safety & Compliance Team

- Assess Heavy Vehicle activities
- Conduct Risk Reviews
- Review / conduct HVNL audits with branches and drivers
- Provide employees with necessary information, training and supervision to allow them to comply with the law.
- Conduct audits on parties in the supply chain that are under company control. and
- Manage non-conformances in accordance with company policies.

3.5 Supervisors

- Supervision of staff and operations
- Ensures that rosters will not contribute to fatigue breaches.
- Ensuring that everything reasonably practicable is done to ensure that drivers do not work while impaired by fatigue or drive in breach of their work or rest options.
- Engages with sub-contractors.
- Notify drivers and Scheduler if operations will be delayed by 30 minutes or more.
- Ensure operators are compliant with HVNL, mass, dimension, load restraint, speed and fatigue through observation.
- Conducts compliance checks and inspections.
- Facilitates toolbox meetings

- Reporting any HVNL CoR issues and Non-Conformances.
- Identify, assess, evaluate and control risks.
- Manage compliance with Speed, fatigue, mass, dimension, loading and vehicle standards.
- Document and record actions taken to manage HVNL.
- Intervene if you notice a party in the supply chain breaching HVNL and stop the breach.
- Notify the site/area manager immediately of any non-conformances.
- Supervise loading of vehicles so that they comply with the vehicles mass and dimension limits and ensure that the load is secured using a method that complies with the legal requirements.
- Do not encourage or incentivize breaches of fatigue, speed or loading requirements with employees. and
- Do not provide incorrect or incomplete information to the driver of a heavy vehicle regarding the load to be transported.

3.6 Operators (Drivers)

- Working with due care, consideration and safeguard of their own and others health and safety.
- Ensuring fitness for duty.
- Not driving a vehicle if fatigued.
- Disclosing any matter that may affect you or other workers fitness for duty
- Verifying the start time does not place you in breach of the HVNL.
- Taking the required statutory rest breaks as per HVNL.
- Monitoring their own performance and taking regular periods of rest to avoid fatigue.
- Inspecting their vehicle prior to start, at end of the working day and reporting any mechanical faults or repairs required as soon as possible.
- Completing prestart form that accurately reflects the vehicle condition.
- Ensure all loads are properly secured.
- Ensuring that their vehicle does not exceed dimension, mass or load limits.
- Ensuring that any equipment is appropriately restrained.
- Driving in a safe and responsible manner to comply with all road rules and laws.

- Responding to changes in circumstances such as delays and communicating those delays or changes to Management.
- To ensure a high standard of housekeeping. and
- Complying with all company and site policies and procedures.

4. Speed Management

Winslow will issue agreements to operators which do not influence drivers to exceed the speed limit. Winslow will issue regular alerts to operators reinforcing compliance with road rules and posted speed limits and additionally, will hold toolbox meetings with topics associated with HVNL.

5. Fatigue Management

Winslow will carry out reviews of dockets/timesheet data and compare to GPS tracking. Any discrepancies will be treated as a serious safety breach. In addition, regular safety alerts to operators reinforcing fatigue management.

Most operators employed by Winslow work under the Standard Hour Fatigue requirements listed in the table below, Operators are aware that if they are over 100kms from their base they are required to complete a National Drivers Fatigue Diary.

Standard Hours

Time	Work	Rest
In any period of...	A driver must not work for more than a **MAXIMUM** of...	And must have the rest of that period off work with at least a **MINIMUM** rest break of...
5 1/2 hours	5 1/4 hours work time	15 continuous minutes rest time
8 hours	7 1/2 hours work time	30 minutes rest time in blocks of 15 continuous minutes
11 hours	10 hours work time	60 minutes rest time in blocks of 15 continuous minutes
24 hours	12 hours work time	7 continuous hours stationary rest time*
7 days	72 hours work time	24 continuous hours stationary rest time

6. Mass Management

All Winslow vehicles are monitored for mass management where required.

- Truck Mounted Attenuators do not change in weight as they do not carry additional goods
- Non-Destructive Digging & Drain Cleaning units are calibrated every 6 months which includes the review of the truck mass.
- All other vehicles are reviewed against their GVM when/if required.

Drivers are instructed under no circumstances to operate an overloaded vehicle and to always comply with vehicle load plans and SWMS. In addition, regular safety alerts to operators reinforcing Mass Management.

7. Load Restraint

A load on a heavy vehicle must not be placed in a way that makes the vehicle unstable or unsafe and must be secured so that it is unlikely to fall or dislodge.
With regards to Winslow's types of vehicles utilize containment as the main load restraint method however auxiliary equipment are provided with adequate restraint equipment. Furthermore, items in the cab are required to be stowed so that they do not present a safety hazard that includes small items on dash boards' seats and on the floor of the cab.

All loads being delivered to and from site must be load restrained (for soils & quarry products tarps must be used on all trucks entering and leaving). Trucks transporting soil and materials (tippers & articulated dump trucks) within the boundaries of the site are exempt from using tarps to cover their loads.

8. Temporary Vehicular Access Points and Frequency of Use (Haulage Plan);

A sketch of the proposed temporary vehicle access point to the Site Compound and Material Laydown Areas is shown below, which is located at the entry to the Development Site at Stage 1, Courtney Drive, Upper Coomera. The frequency of use will be guided by the works onsite. Accesses through the identified haul routes shall be via all weather gravel access tracks with appropriate shake down/rumble grids at the points of entry/exit.

1. Light Vehicles, (1), are to use 79 Courtney Drive as the designated access and exit points.

2. Heavy vehicles, (2), are to use 97 Cortney Drive as the designated access and exit points.

3. Mackellar Dr, (3), is to be use when construction of the civil component of works commences. This access point will be used for the import materials used in the construction on the project. Thes materials can range from concrete, roadbase material, gravel, stormwater, water, sewer materials etc. The materials will change depending on the life cycle of the project.

4. Rangeview Rd, (4), is to be use when construction of the civil component of works commences. This access point will be used for the import materials used in the construction on the project. Thes materials can range from concrete, roadbase material, gravel, stormwater, water, sewer materials etc. The materials will change depending on the life cycle of the project.

*Access for via Rangeview Rd and Mackellar Dr will change depending on the where the project is in its lifecycle.

On average there will be 20-30 vehicles using 79 & 97 Courtney Drive as the access points for the duration of the 29 week (scheduled) project. During the road base import operation, its estimated that 6-8 truckloads per hour will be delivered to the work area through Rangeview and Mackellar Dr. During the concrete items i.e. stormwater structures, sewer structures, footpaths, kerb and so on the requirements for concrete deliveries may range from 1 delivery per day (minor works) up to 3 loads per hour during kerb construction.



9. Dimension Compliance

Winslow advises operators that all auxiliary equipment is stored as instructed by the manufacturer when not in operation on site.

10. Maintenance / Roadworthiness

Winslow shall monitor their heavy vehicles through inspection at service intervals in addition drivers are required to complete a pre-start. Where a fault is identified it is to be communicated directly to the Operations Manager or supervisor and the Fleet department. All Winslow Plant is serviced and repaired by a qualified Heavy Vehicle Mechanic.

11. Audits

Winslow will conduct random audits to ensure drivers are compliant with this document and HVNL any non-conformances will be dealt with by way of a Non-Conformances Report (NCR).

12. Training

Winslow will conduct a combination of toolbox and awareness training utilizing material supplied by the National Heavy Vehicle Regulator to ensure that drives are aware of any changes to the HVNL in addition drivers will be supplied a copy of the Master Code to further assist them in compliance.

Training will be considered on an individual need's basis.

13. Heavy Vehicle Drivers Code of Conduct

Purpose and Objectives

This Driver Code of Conduct aims to minimise the impacts of construction traffic on transport networks and adjoining properties. The purpose of this Code is to clearly define and detail acceptable behavior for all heavy vehicle drivers operating for Ultimate Site Services.

Responsibilities of Drivers

- Drivers are to follow ALL rules and regulations required by law including:
  - Hold a current and appropriate license for the vehicle they are operating
  - Comply with speed limits on all roads
  - Obeying posted (road) load limits
  - Comply with all road works speed limits
  - Obey construction traffic signs and devices
  - NOT overload or allow vehicles to be overloaded
- Drivers are to practice safe driving behavior which includes, but is not limited to:
  - Driving in a manner that is appropriate with road and weather conditions
  - Not operating any machines whilst suffering from fatigue or under the influence of drugs and/or alcohol.
- Drivers must always behave in a professional manner.
- Drivers must adhere to routes nominated for any specific construction activity and consistent with the Traffic and Access Management Plans (TAMP) or Vehicle Movement Plans (VMP) for that activity.
- When not on site, drivers should only park where they are legally able to do so.
- Drivers must comply with allowable work hours for project sites.

- Drivers parking is to engage the park brake and leave the vehicle in gear. Never leave the vehicle with the engine running. Drivers leaving their vehicle must wear appropriate PPE (site / company standard).
- Vehicles must not transfer dirt or debris onto public roads.
- If approached by individuals with enquiries about the Works, drivers are not to engage with the individual beyond providing them with a company or client phone contact number.
- As a courtesy to individuals who may be impacted by driver behavior, drivers will:
  - Not use compression braking unless it is an emergency or if deemed necessary
  - Minimise idling
  - Ensure that there is no littering
  - Remain calm and courteous when in contact with other members of the public Maintain trucks in good working order and a clean and tidy condition.

14. Safety and Compliance Rules

Winslow management systems are designed to direct management, employees and subcontractor/s to the process and procedures that will assist in providing a workplace where they can fulfil their task-based activities without work-related health effects or harm to the environment and the community. Winslow recognizes that these goals will only be attained through learning from own experiences and developing our employees to understand the risks and apply the relevant procedures and controls.

Foundation Rules

If a task can't be carried out safely – we will always ***STOP*** until it can be done without harming anyone. We will:

- Take responsibility for our own safety and the safety of our work mates.
- Assess the risks associated with each task and plan accordingly.
- Make sure we are competent to perform the task.
- Ensure we stop work if it is unsafe.
- Report all hazards, incidents, injuries, and near misses. and
- Wear and use appropriate personal protective equipment.

Winslow believes that:

- No objective will come before health, safety and the environment.
- All injuries are preventable.
- All individuals involved in work activities must have the appropriate knowledge, skills and equipment to assess and manage hazards and work safety. and
- Through the application of hazard identification and effective risk management we can achieve incident and injury free workplaces.

Winslow commits to focusing on a safety management system that includes but is not limited to HVNL and the key areas of:

- Fatigue.
- Mass.
- Dimension.
- Load restraint.
- Speed. and
- Vehicle standards.

The HVMP promotes the following understanding:

- That through the application of the HVNL CoR Plan, effective supervision, the development of our employees and open communication we can implement practical solutions for the management of HVNL.

That through the risk management process of hazard identification, risk assessment and the appropriate controls, risk can be lowered to reasonable and acceptable levels.

15. HVNL CoR Risk Register

Step 1. Identify hazards	**Step 2. Assess risk**	**Step 3. Identify existing controls**	**Step 4. Treat risk**	**Step 5. Monitor and review.**
Identify anything that could potentially cause **harm** or **loss**	Consider how the hazard or risk could cause **harm** or **loss**	Look at your existing controls to **eliminate** or **minimise** the risk so far as reasonably practicable	Try to eliminate the risk first but, if that's not possible, put **additional** controls in place to minimise the risk so far as is reasonably practicable	**Regularly** monitor and review the controls you've put in place to make sure they're working as planned
Speed				
Drivers exceeding safe speed limits	➢ A driver could have an accident resulting in serious injury or death for the driver and other road users.	➢ Schedules all time for delays and don't encourage drivers to speed. ➢ Drivers are trained in maintaining safe speeds and informed of changes to speed limits on route.	➢ Drivers are required to report any breaches for speeding. ➢	➢ Check a sample of trip records every month to make sure they provide enough time for the journey to be completed safely. ➢ Check annually to make sure all driver inductions and training are up to date.
Fatigue				
	➢ A driver could have an accident resulting in serious injury or death for the driver and other road users. ➢ A driver could forget to do something properly, like restrain a load or do a pre-start check.	➢ Drivers *MUST BE* fit for duty and are assessed for signs of fatigue before leaving the yard. ➢ Random drug and alcohol testing is conducted in line with the Drug and Alcohol Policy. ➢ Drivers can stop and rest whenever they need to without fear of getting into trouble.	➢ Drivers and schedulers are trained – at induction and at regular toolbox talks – in identifying and managing fatigue, work and rest limits, and recordkeeping.	➢ Review a sample of trip records every month to check whether they are consistent with the scheduling and rostering procedure and compliant with work and rest hour limits.
Dimension				

HVNL & HAULAGE MANAGEMENT PLAN

Step 1. Identify hazards	Step 2. Assess risk	Step 3. Identify existing controls	Step 4. Treat risk	Step 5. Monitor and review.
Identify anything that could potentially cause **harm** or **loss**	Consider how the hazard or risk could cause **harm** or **loss**	Look at your existing controls to **eliminate** or **minimise** the risk so far as reasonably practicable	Try to eliminate the risk first but, if that's not possible, put **additional** controls in place to minimise the risk so far as is reasonably practicable	**Regularly** monitor and review the controls you've put in place to make sure they're working as planned
Vehicle load is over dimension.	➢ The load could hit another road user, pedestrian, or piece of infrastructure (e.g., bridge, street sign or building).	➢ Loads are carried on appropriate vehicles with necessary permits. ➢ Load dimensions is inspected before journey departure.	➢ Drivers and loader are trained in dimension limits.	➢ Check annually that all driver and loader inductions and training are up to date. ➢ Investigate any instances where a vehicle or load is over dimension.
Mass				
A vehicle could be overloaded, or a load not positioned properly	➢ This could increase mechanical component wear, impact vehicle performance and damage infrastructure.	➢ Vehicle mass limits are identified before loading and actual mass are determined before each journey. ➢ Drivers and loaders are trained in calculating and recording 'gross' and 'axle' weights. ➢ Drivers and clients are advised that company policy is to not pick up over-mass loads.	➢ It is a requirement that all new equipment purchased will be fitted with weight-measuring devices.	➢ Review a sample of weighbridge dockets to verify mass calculations are accurate. ➢ Check annually that driver and loader induction and training are up to date.
Loading				

HVNL & HAULAGE MANAGEMENT PLAN

Step 1. Identify hazards	Step 2. Assess risk	Step 3. Identify existing controls	Step 4. Treat risk	Step 5. Monitor and review.
Identify anything that could potentially cause **harm** or **loss**	Consider how the hazard or risk could cause **harm** or **loss**	Look at your existing controls to **eliminate** or **minimise** the risk so far as reasonably practicable	Try to eliminate the risk first but, if that's not possible, put **additional** controls in place to minimise the risk so far as is reasonably practicable	**Regularly** monitor and review the controls you've put in place to make sure they're working as planned
Incorrect load restraint	➢ The load could fall from the vehicle and hit another road user or pedestrian or fall on the driver or person unloading.	➢ Drivers and loaders are trained in correct load restraint procedure at induction and at regular toolbox talks.	➢ Load restraint is checked prior to departure and during the journey.	➢ Check annually that driver and loader induction and training are up to date. ➢ Check a sample of loads once a fortnight to make sure they are properly restrained.
Drivers' distraction				
Driver distracted by mobile device	➢ A driver could cause an accident while being distracted by a mobile device.	➢ Company policy is aligned with law relating to mobile phone usage. ➢ Regular rest breaks allow drivers to make and return calls and texts.	➢ All employees are given training regarding the hazards of using a mobile device while driving and familiarisation with the company mobile device policy.	➢ Perform spot checks on mobile device usage. Take disciplinary action for breaches in line with mobile device policy.
Vehicle standards				
Operating an unroadworthy vehicle	➢ The vehicle could cause an accident or be unable to avoid an accident.	➢ Vehicles are services and components replaced within manufactures specifications, or sooner if a fault is sound.	➢ Drivers complete a daily check on their vehicle before starting a journey. ➢ Drivers report identified faults on their vehicle before starting or during a journey.	➢ Check records every week to make sure all daily checks are being completed. ➢ Check vehicle maintenance records every quarter to make sure all vehicle servicing is up to date.
Third party interactions				
A third-party provider doesn't	➢ The third-party provider	➢ Thirds party providers are given CoR	➢ Third party providers must	➢ Check engagement checklist

Step 1. Identify hazards	Step 2. Assess risk	Step 3. Identify existing controls	Step 4. Treat risk	Step 5. Monitor and review.
Identify anything that could potentially cause **harm** or **loss**	Consider how the hazard or risk could cause **harm** or **loss**	Look at your existing controls to **eliminate** or **minimise** the risk so far as reasonably practicable	Try to eliminate the risk first but, if that's not possible, put **additional** controls in place to minimise the risk so far as is reasonably practicable	**Regularly** monitor and review the controls you've put in place to make sure they're working as planned
believe they are a party in the Chain of Responsibility (CoR) and therefore the safety duties in the legislation don't apply to them.	could impact on the transport operation and cause a breach of the law	reference material and shown how their services or requests can impact on the operation. ➢ The third-party provider is directed to the NHVR website for more information and encouraged to develop an SMS to manage the risks.	complete contractor engagement checklist.	responses and SMS documents and records prior to entering into a contract. ➢ Check records to make sure there have been no contraventions of the safety duties legislation/HVNL.
Other hazards				
Employees and machines are operating together in close proximity	➢ An employee could be hit by a vehicle or piece of plant.	➢ All personnel are to wear hi-vis clothing. ➢ Exclusion zone (Red Zone) to be adhered to. ➢ UHF/Mobile Communications to be utilised at all times.	➢ All personnel to be made familiar with the site requirements and adhere to Red Zone protocols. ➢ UHF/Mobile communication to be applied.	➢ Perform spot checks on site to see whether employees are observing rules associated with red zone and wearing hi-vis clothing.

16. Legislative Changes to HVNL

Legislative changes to Heavy Vehicle National Law commenced 1 October 2018
From its inception in 2012, the Heavy Vehicle National Law (HVNL) has aimed to regulate drivers and the off-road parties who influence the supply chain and logistics—the so-called “Chain of Responsibility” or CoR provisions.

The HVNL commenced as a national law in February 2014 and operated on a deemed liability basis. That is, when an on-road offence was detected, other “parties in the chain of responsibility” were deemed to be liable. Parties in the CoR include employers, prime contractors, operators, consignors, consignees, schedulers, loaders and others. As first enacted, the HVNL generally only contemplated offences against fatigue, speed, mass, dimension and loading of a heavy vehicle.

It was then incumbent on those parties in the CoR to prove they had taken all reasonable steps to prevent a breach from occurring.

Amendments commencing in October 2018 reformulate the CoR obligations on a party as an overarching and positive duty of care, consistent with the duty of care approach adopted in other safety laws.

Introduction of a primary duty
The new legislative regime abolishes deemed liability for parties in the CoR and replaces it with a duty to ensure, so far as is reasonably practicable, the safety of the party’s transport activities relating to the vehicle.

Introduction of Executive officer liability
An executive of a legal entity that has a safety duty must also exercise due diligence to ensure the legal entity complies with the duty. Executives who knowingly authorise or permit conduct that constitutes an offence also commit the offence

Jurisdictional Limits
The amended HVNL will allow indictable offences to be brought either on indictment or in a summary way. Sentiency options now include custodial sentencing and maximum penalties of $300 000 for an individual and $3 000 000 for a corporation.

Vehicle Standards
Introduction of Vehicle Standards into HVNL
On 1 October 2018, the Heavy Vehicle National Law (HVNL) was amended to provide that every party in the heavy vehicle transport supply chain has a duty to ensure the safety of their transport activities. In practical terms, this primary duty represents an obligation to eliminate or minimise potential harm or loss (risk) by doing all that is reasonably practicable to ensure safety. As a party in the supply chain, the best way to do this is to have safety management systems and controls in place, such as business practices, training, procedures and review processes that:

- Identify, assess, evaluate, and control risk
- Manage compliance with speed, fatigue, mass, dimension, loading and vehicle standards requirements through identified best practice
- Involve regular reporting, including to executive officers.
- Document or record actions taken to manage safety.

Chain of Responsibility Policy

The purpose of this policy is to ensure provision of guidance on chain of responsibility to all relevant staff within the Winslow Group.

This policy is designed to form part of Winslow compliance strategy and applies to all employees, sub-contractors, suppliers, and visitors within the Winslow group of companies that have responsibility for or involvement in activities that fall within the scope of the road transport legislations.

This may include (but not be limited to) roles within logistics, supply chain and support roles. This includes, full time, part time and casual employees as well as contractors or subcontractors working for or on the behalf of Winslow.

At Winslow we incorporate the ideals of safer work environment for all our employees and our transport and logistics partners through our commitment and compliance to our chain of responsibility policy.

We recognise our various roles within the chain of responsibility and have developed systems and procedures to facilitate compliance within our networks. Winslow conducts training on systems and procedures and also audit them to ensure compliance is achieved.

Policy, Systems and Procedures

In order to achieve compliance, Winslow is committed to the following actions and practices:

- **Driver fatigue and speeding**: Management of transport scheduling, monitoring of work and driving hours, timeslot management, training, and awareness sessions for relevant personnel.
- **Mass management**: Management of vehicle specification, vehicle load plans, container weight declarations, procedures, and training for relevant personnel.
- **Load restraint**: Management of equipment application procedures and training for relevant personnel.
- **Drug and Alcohol**: Management of drug and alcohol for road transport drivers (refer: Drug and Alcohol Policy for Road Transport Drivers)
- **Asset management**: Management of Winslow owned vehicles in accordance with the National Heavy Vehicle Regulator (NHVR) maintenance guidelines.

Training

Chain of responsibility is incorporated within induction and refresher training for all relevant personnel in addition to their employment contracts inserted with chain of responsibility requirements.

Audit and Compliance

Winslow schedules and conducts its internal audits and external third-party audits are carried out annually on its management systems. Compliance audits on sub-contractors engaged by Winslow are performed where appropriate to achieve its chain of responsibility compliance.

Achieving safe transport operations is critical to the success of Winslow as an organisation. This policy sets out to ensure efforts are made towards that end.

Related Policies include as follow:

- Health & Safety Policy
- Drug & Alcohol Policy

References: Winslow CoR Procedure. WINBMS-OP-18 Chain of Responsibility HVNL

APPENDIX J

NOISE MANAGEMENT PLAN

NOISE MANAGEMENT PLAN

COURTNEY DRIVE, UPPER COOMERA QLD 4209, STAGE 2



Document Control Sheet

Issue 1	Name	Signature
Prepared By	Aaron Fysh	
Checked & Approved By	Michael Jabbour	

Document Revision Record

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1 Introduction

HB QLD Pty Ltd (HB Land) have been engaged by Winslow to develop a Noise Management Plan (NMP) for the proposed Construction of a residential subdivision on Courtney Drive Stage 2 Upper Coomera Queensland 4209 (hereafter referred to as 'the site'). The site location and boundary has been further illustrated in **Figure 1**. It is understood from the information received from the client that the proposed works are to include the following:

- Bulk earthworks;
- Clearing and grubbing;
- Stormwater reticulation construction;
- Sewer reticulation construction;
- Watermain Reticulation Construction;
- Retaining Wall Construction;
- roadworks including concrete works and footpaths ; and
- Electrical installation.

Noise sensitive receptors as defined by the *Environmental Protection (Noise) Policy* 2019 (hereby referred to as 'the Policy') are located nearby the demolition site. Further details have been provided within **Section 4.2.** Noise assessments are undertaken as part of an environmental impact assessment to ensure that noise emissions comply with the Environmental Protection (Noise) Regulations 1997. long-term environmental noise exposure has been linked to community health impacts.

Movement of materials, demolition activities, and activities involving use of power tools have the potential to contribute to noise emissions, potentially impacting human health and the amenity value of the site if not effectively managed. As such, management is proposed in line with the *EP Act 1986 Section 49 and the Noise Regulations 1987.*

1.1 Objective

The objective of this NMP is to ensure appropriate management measures are implemented during the proposed works at the site to minimize potential noise impacts. Objectives of managing noise include:

- Provide a description of the proposed works;
- Identify the nearest sensitive receptors;
- Provide a description of the noise criteria within the Policy;
- The minimisation of noise on the construction site;

- The provision of an effective communication link between adjoining residents and the construction site for the management of complaints regarding noise; and
- Assess the potential noise impacts.

1.2 Legislation

It is a requirement of the Queensland Government that noise and vibration limits for human comfort are met during active hours of demolition and construction activities. Queensland Government and the Gold Coast City Council ensures that the *Environmental Protection Act 1994* is referred to in order to establish a set of criteria restricting audible noise concentrations during construction works. Maximum internal noise criteria and predicted sound pressure levels are determined using the following Australian Standards:

- Australian Standard AS2436-2010 Guide to noise control on construction, maintenance, and demolition sites; and
- AS/NZS 2107: 2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.

Maximum internal noise criteria and predicted sound pressure levels are determined using the Australian Standard AS/NZS 2107: 2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.

2 Description Proposal

Noise minimisation strategies incorporating industry best practice procedures and controls will be adopted to manage all noise generating activity within the work area, when managing the generation of noise, the most effective method is to ensure work practices generate minimal noise through alternative equipment or with silencer or muffler devices, this will additionally aid in reducing the impact on the sensitive areas on the site.

2.1 Site general description

The Construction work will take place at Courtney Drive Upper Coomera Queensland 4209; According to the Department of Planning, Land and Heritage database, the site is within the redevelopment area of interest, in line with the Urban Development Master Plan for Upper Coomera. Zoning and land use classification contribute to the diverse character of the site, combining elements of community facilities, open spaces, and potentially residential components.

2.2 Description of the proposed work

The proposed machinery/Equipment is listed below in Section 2.4. For the purposes of this Noise Management Plan, it will be assumed that the equipment listed will be operated in different stages and, as such, each phase provides potential noise impacts for receivers. In line with information supplied by Winslow, the project comprises of work at Courtney Drive Upper Coomera Queensland 4209. **Table 2.1** describes the phases of the project and activities to be undertaken during Construction work:

Table 2.1 - Project Phases

Stage of Project	Methodology	Status
Stage 1	1.1 Bulk Earthworks and 1.2 Civils Works	In Progress
Stage 2	2.1 Bulk Earthworks 2.2 Civils Works	Incomplete
Stage 3	3.1 Bulk Earthworks	Incomplete
Stage 4	4.1 Bulk Earthworks	Incomplete
Stage 5	5.1 Bulk Earthworks	Incomplete

2.3 Timing of Project

The aforementioned project located at Courtney Drive Upper Coomera Queensland 4209 is expected to be commenced on 1st April 2024. Overall, it is estimated that site operations will take 29 weeks to complete by October 2024.

2.4 Equipment

The equipment required during the execution of the project is below in **Table 2.2**

Table 2.2 Proposed Machinery/equipment

Units	Machinery / Equipment
2	Dozers (D8)
1	Dozer (D10)
1	Mulcher
5	Excavators
3	Compactors 815/825
3	Rollers
5	Articulated Dump Trucks 40ton /45ton
1	Grader
More than 1	Watercarts sizes up to 35kL Articulated
More than 1	Trucks (Delivery of concrete & quarry materials)
	Various earthmoving plant and machines

2.5 Hours of work

According to the *Environmental Protection Act 1994*, Division 3 Default noise standards - 440R Building work, construction work must be carried out between 6.30 a.m. to 6.30 p.m. Monday to Saturday; Therefore, the project activities will be carried out within the hours of 6.30 am to 6.00pm, Monday to Saturday at Courtney Drive Upper Coomera Queensland 4209; No work on Sundays or Public Holidays is expected.

2.6 Noise Level of Equipment and Processes

The noise generating machinery and equipment expected to be used during the operating hours of the project being carried out at the site are estimated and included in **Table 2.3.** Noise levels are derived from Australian Standard *AS2436-2010 Guide to noise control on construction, maintenance, and demolition sites.* Table A1 of

Appendix A.

Table 2.3 Equipment expected to be used during the operating hours.

Equipment	Indicative Sound Power Level (mid-point)	Indicative Sound Pressure Level at 10m Distance
Excavators	107	79
Watercarts	107	79
Trucks	107	79
Rollers	108	80
Dozers	109	80
Mulcher	109	80
Grader	110	82
Compactors	113	85
Trucks (Dump)	117	89

The Indicative Sound Power Level (mid-point) from each piece of machinery has been used to calculate the combined A-weighted Sound Power Level for the site works. This calculation is explained in Section 5 of this Management Plant.

3 Noise Standards

3.1 Queensland environmental Law

In Queensland, the environmental impacts of noise emissions associated with environmentally relevant activities are regulated under the Environmental Protection Act 1994 and subordinate legislation, including the Environmental Protection Regulation 2019 and the Environmental Protection (Noise) Policy 2019.

3.2. Noise Standards

The *Environmental Protection (Noise) Policy 2019* regulates the level of noise emitted from any premise or public place that can be received at other premises. Schedule 1 stipulates the maximum allowable external noise levels with the combination of base levels, as shown in **Table 3.1** below. These are based on **Table 1** of Appendix A of The Australian Standards.

Table 3.1 Baseline Assigned Noise Levels for all works.

Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) *dB(A)*			Environmental value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
Residence (for outdoors)	Daytime and evening	50	55	65	health and wellbeing
Residence (for indoors)	Daytime and evening	35	40	45	health and wellbeing
	Nighttime	30	35	40	health and wellbeing, in relation to the ability to sleep
Library and educational institution (including a school, college and university) (for indoors)	when open for business or when classes are being offered	35			health and wellbeing
Childcare centre or kindergarten (for indoors)	when open for business, other than when the children usually sleep	35			health and wellbeing
Childcare centre or kindergarten (for	when the children usually sleep	30			health and wellbeing, in relation to the

Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) *dB(A)*			Environmental value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
indoors)					ability to sleep
School or playground (for outdoors)	when the children usually play outside	55			health and wellbeing, and community amenity
Hospital, surgery or other medical institution (for indoors)	visiting hours	35			health and wellbeing
Hospital, surgery or other medical institution (for indoors)	anytime, other than visiting hours	30			health and wellbeing, in relation to the ability to sleep
Commercial and retail activity (for indoors)	when the activity is open for business	45			health and wellbeing, in relation to the ability to converse
Protected area or critical area	anytime	the level of noise that preserves the amenity of the existing area or place			Health and biodiversity of ecosystems
Marine Park	anytime	the level of noise that preserves the amenity of the existing marine park			Health and biodiversity of ecosystems
Park or garden that is open to the public (whether or not on payment of an amount) for use other than for sport or organised entertainment	anytime	the level of noise that preserves the amenity of the existing park or garden			Community amenity

Due to the lack of specific clarification within the Environmental Protection (Noise) Policy 2019, the Environmental Protection (Noise) Regulations 1997 may be considered appropriate for further calculations in this report. The Environmental Protection (Noise) Regulations 1997 (as amended 2017) regulates the level of noise emitted from any premise or public place that can be received at other premises. Regulations 7 and 8 stipulate the maximum allowable external noise levels with the combination of base levels, as shown in **Table 3.2** below, to an influencing factor. These are based on Table 1 of Appendix A of The Australian Standards.

Table 3.2. Baseline Assigned Noise Levels for all works.

Type of premises receiving noise	Time of day	Assigned level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Mon-Sat	45+IF	55+IF	65+IF
	0900 to 1900 hours Sun and Pub Hols	40+IF	50+IF	65+IF
	1900 to 2200 hours all days	40+IF	50+IF	55+IF
	2200 to 0700 Mon to Sat 2200 to 0900 Sun and Pub Hols	35+IF	45+IF	55+IF
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises other than those in the Industrial Area	All hours	75	85	90

4 Noise Sensitive Receptors

The Environmental Protection (Noise) Regulations 1997 Schedule 3 indicates that two concentric circles, having radii of 100m and 450m, are required to determine noise sensitive receptors. The distance to sensitive receptors is measured from the boundary of the proposed prescribed premise to the boundary of the residential/public purpose Lot.

There are 45 sensitive receptors located within 100m of the construction site. This has been detailed and listed below in **Table 4.1.** The location of these sensitive receptors has been outlined in **Figure 2.**

Table 4.1. Distance from construction works to noise-sensitive receptors (<100m)

Receiver	Description	Location	Proximity to site boundary (m)
1	Residential	33 Gordon dr, upper Coomera QDL 4209	79.8
2	Residential	4 Patterson ct, upper coomera QDL 4209	50
3	Residential	31 Gordon dr, upper coomera QDL 4209	98
4	Residential	7 Patterson ct, upper coomera QDL 4209	20
5	Residential	5 Patterson ct, upper coomera QDL 4209	20
6	Residential	3 Patterson ct, upper coomera QDL 4209	53
7	Residential	6 Mackellar dr, upper coomera QDL 4209	3
8	Residential	4 Mackellar dr, upper coomera QDL 4209	33
9	Residential	2 Mackellar dr, upper coomera QDL 4209	62
10	Residential	5 Mackellar dr, upper coomera QDL 4209	2
11	Residential	3 Mackellar dr, upper coomera QDL 4209	26
12	Residential	1 Mackellar dr, upper coomera QDL 4209	53
13	Residential	23 Gordon dr, upper coomera QDL 4209	2
14	Residential	4113/25 Gordon dr, upper coomera QDL 4209	26
15	Residential	21 Gordon dr, upper coomera QDL 4209	28
16	Residential	79 Courtney dr, upper coomera QDL 4209	13
17	Residential	19 Gordon dr, upper coomera QDL 4209	41
18	Residential	17 Gordon dr, upper coomera QDL 4209	59
19	Residential	15 Gordon dr, upper coomera QDL 4209	60
20	Residential	13 Gordon dr, upper coomera QDL 4209	61
21	Residential	11 Gordon dr, upper coomera QDL 4209	50.5
22	Residential	9 Gordon dr, upper coomera QDL 4209	48.5

Receiver	Description	Location	Proximity to site boundary (m)
23	Residential	65 Courtney dr, upper coomera QDL 4209	13
24	Residential	7 Gordon dr, upper coomera QDL 4209	65
25	Residential	5 Gordon dr, upper coomera QDL 4209	66
26	Residential	3 Gordon dr, upper coomera QDL 4209	103
27	Residential	42 Richardson cres, upper coomera QDL 4209	107
28	Residential	40 Richardson cres, upper coomera QDL 4209	116
29	Residential	2 Gordon dr, upper coomera QDL 4209	130
30	Residential	36 Richardson cres, upper coomera QDL 4209	170
31	Residential	4 Gordon dr, upper coomera QDL 4209	128
32	Residential	8 Gordon dr, upper coomera QDL 4209	111
33	Residential	9 Gordon dr, upper coomera QDL 4209	111
34	Residential	10 Gordon dr, upper coomera QDL 4209	110.9
35	Residential	12 Gordon dr, upper coomera QDL 4209	111
36	Residential	14 Gordon dr, upper coomera QDL 4209	114
37	Residential	16 Gordon dr, upper coomera QDL 4209	91
38	Residential	18 Gordon dr, upper coomera QDL 4209	65
39	Residential	20 Gordon dr, upper coomera QDL 4209	70
40	Residential	96 Courtney dr, upper coomera QDL 4209	76
41	Residential	94 Courtney dr, upper coomera QDL 4209	138
42	Residential	90 Courtney dr, upper coomera QDL 4209	112
43	Residential	76 Courtney dr, upper coomera QDL 4209	103
44	Residential	68 Courtney dr, upper coomera QDL 4209	111
45	Residential	64 Courtney dr, upper coomera QDL 4209	145

5 Calculations

5.1. Sensitive Premises Defined in the Regulations

For the purpose of determining assigned levels for each sensitive receptor and estimating the noise impacts of construction works being undertaken at the site, land use will be defined into noise-sensitive, commercial, and industrial land uses, as defined in Schedule 1 of the Regulations.

5.1.1 100m Buffer Zone

The proportions of the land within 100m of the site boundary are detailed in **Table 5.1** below.

Table 5.1. Land use distribution within 100m

Land Use	Percentage (%) Cover
Noise-sensitive	90
Commercial	0
Industrial	0
Vacant/under construction/roads/verges	10

5.1.2 450m Buffer Zone

The proportions of the land within 450m of the site boundary are detailed in **Table 5.2** below.

Table 5.2. Land use distribution within 450m

Land Use	Percentage (%) Cover
Noise-sensitive	70
Commercial	10
Industrial	0
Vacant/under construction/roads/verges	20

5.2. Determination of Assigned Levels for noise-sensitive premises

The following calculations represent the assigned level for noise, and is calculated as follows:

5.2.1. Industrial (I)

I = (% industrial within 100m buffer + % industrial within 450m buffer) x 1/10

I = (0 + 0) x 1/10

I = 0

5.2.2. Commercial (C)

C = (% commercial within 100m buffer + % commercial within 450m buffer) x 1/10

C = (0 + 10) x 1/10

C = 1

5.2.3. Transport Factor

The impact of traffic is also considered when determining the noise influencing factor. Roads are graded based on their proximity to the site and the volume of traffic that they carry. The influencing factor is calculated as follows:

- Major roads (carrying more than 15,000 vehicles per day) within 100 metres of the site have a transport factor of 6;
- Major roads within 450 metres of the site have a transport factor of 2; and
- Minor roads (carrying 6,000 – 15,000 vehicles per day) within 100 metres of the site have a transport factor of 2.

The transport influencing factor cannot exceed 6.

Traffic data was obtained from the Traffic Census Data – Google Earth Pro from the Queensland Government Open Portal website. Minor roads within 100 metres and there is one major road within 2.95 km of the site. This equates to a transport factor of 2.

5.1.4 Influencing Factor

The Assigned Levels are standard and set out in the Regulations. The calculations incorporate background noise, represented as an influencing factor (IF) which is a reflection of the site characteristics.

Influencing Factor = I + C + TF

Influencing Factor = (0 + 1 + 2)

Influencing Factor = 3

According to the Regulations, the sensitive land use assigned noise limit is outlined in **Table 4.3** below.

Table 5.3. Assigned noise levels for all works

Type of premises receiving noise	Time of day	Assigned level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Mon-Sat	48	58	68

5.3. Noise estimation within sensitive receptor

To determine the estimated noise generated during the works, calculations have been undertaken using the method listed in Appendix B (Estimating Noise from Sites) of the *Australian Standard (AS) 2436:2010- Guide to Noise and vibration control on Construction, demolition, and Maintenance Sites*. This method accounts for the sound level of the equipment and the distance of receptors from the noise source. All areas listed in **Table 4.1** have been taken into consideration as sensitive noise receptors. The typical sound levels from construction, maintenance, and demolition plant equipment listed in Table A1 of Appendix A of *AS 2436- 2010* have been used to estimate the equipment for the project (**Tables 2.2. and 2.3**). The calculations have been based on a worst-case scenario with all equipment operating simultaneously, however, it should be noted that it is unlikely all equipment will be operating at the same time. The results of these calculations are displayed in **Table 5.4 and 5.5** and the detailed calculations are included in **Appendix A**.

Table 5.4 Cumulave sound pressure level (L_{wa}) of proposed site equipment

Equipment	Indicative Sound Pressure Level at 10m Distance	Cumulave Sound Pressure Level (L_{wa}) (dB)
Trucks (Dump)	89	-
Compactors	85	90
Grader	82	91
Rollers	80	91
Dozers	80	91
Mulcher	80	91
Excavators	79	91
Watercarts	79	91
Trucks	79	91

Table 5.5 List of receptors areas of the site and assigned noise level

Receptor	Distance to Site boundary (m)	Cumulative sound pressure level (L_{wa})	Log Values of distance ($Log_{10}R$)	Estimated Sound Level (L_{pa})	Assigned Level (dBA)- (LA_{max})	Exceeds Assigned Level
33 Gordon dr, upper Coomera QDL 4209	79.8	91	1.9	45	68	No
4 Patterson ct, upper coomera QDL 4209	50	91	1.7	49	68	No
31 Gordon dr, upper coomera QDL 4209	98	91	1.99	43	68	No
7 Patterson ct, upper coomera QDL 4209	20	91	1.3	57	68	No
5 Patterson ct, upper coomera QDL 4209	20	91	1.3	57	68	No
3 Patterson ct, upper coomera QDL 4209	53	91	1.72	49	68	No
6 Mackellar dr, upper coomera QDL 4209	3	91	0.48	73	68	yes
4 Mackellar dr, upper coomera QDL 4209	33	91	1.52	53	68	No
2 Mackellar dr, upper coomera QDL 4209	62	91	1.79	47	68	No
5 Mackellar dr, upper coomera QDL 4209	2	91	0.3	77	68	Yes
3 Mackellar dr, upper coomera QDL 4209	26	91	1.41	55	68	No
1 Mackellar dr, upper coomera QDL 4209	53	91	1.72	49	68	No
23 Gordon dr, upper coomera QDL 4209	2	91	0.3	77	68	Yes

Receptor	Distance to Site boundary (m)	Cumulative sound pressure level (L_{wa})	Log Values of distance ($Log_{10}R$)	Estimated Sound Level (L_{pa})	Assigned Level (dBA)- (LA_{max})	Exceeds Assigned Level
4113/25 Gordon dr, upper coomera QDL 4209	26	91	1.41	55	68	No
21 Gordon dr, upper coomera QDL 4209	28	91	1.45	54	68	No
79 Courtney dr, upper coomera QDL 4209	13	91	1.11	61	68	No
19 Gordon dr, upper coomera QDL 4209	41	91	1.61	51	68	No
17 Gordon dr, upper coomera QDL 4209	59	91	1.77	48	68	No
15 Gordon dr, upper coomera QDL 4209	60	91	1.78	47	68	No
13 Gordon dr, upper coomera QDL 4209	61	91	1.79	47	68	No
11 Gordon dr, upper coomera QDL 4209	50.5	91	1.7	49	68	No
9 Gordon dr, upper coomera QDL 4209	48.5	91	1.69	49	68	No
65 Courtney dr, upper coomera QDL 4209	13	91	1.11	61	68	No
7 Gordon dr, upper coomera QDL 4209	65	91	1.81	47	68	No
5 Gordon dr, upper coomera QDL 4209	66	91	1.82	47	68	No
3 Gordon dr, upper coomera QDL 4209	103	91	2.01	43	68	No

Receptor	Distance to Site boundary (m)	Cumulative sound pressure level (L_{wa})	Log Values of distance ($Log_{10}R$)	Estimated Sound Level (L_{pa})	Assigned Level (dBA)- (LA_{max})	Exceeds Assigned Level
42 Richardson cres, upper coomera QDL 4209	107	91	2.03	42	68	No
40 Richardson cres, upper coomera QDL 4209	116	91	2.06	42	68	No
2 Gordon dr, upper coomera QDL 4209	130	91	2.11	41	68	No
36 Richardson cres, upper coomera QDL 4209	170	91	2.23	38	68	No
4 Gordon dr, upper coomera QDL 4209	128	91	2.11	41	68	No
8 Gordon dr, upper coomera QDL 4209	111	91	2.05	42	68	No
9 Gordon dr, upper coomera QDL 4209	111	91	2.05	42	68	No
10 Gordon dr, upper coomera QDL 4209	110.9	91	2.04	42	68	No
12 Gordon dr, upper coomera QDL 4209	111	91	2.05	42	68	No
14 Gordon dr, upper coomera QDL 4209	114	91	2.06	42	68	No
16 Gordon dr, upper coomera QDL 4209	91	91	1.96	44	68	No
18 Gordon dr, upper coomera QDL 4209	65	91	1.81	47	68	No

20 Gordon dr, upper coomera QDL 4209	70	91	1.85	46	68	No

Receptor	Distance to Site boundary (m)	Cumulative sound pressure level (L_{wa})	Log Values of distance ($Log_{10}R$)	Estimated Sound Level (L_{pa})	Assigned Level (dBA)- (LA_{max})	Exceeds Assigned Level
96 Courtney dr, upper coomera QDL 4209	76	91	1.88	45	68	No
94 Courtney dr, upper coomera QDL 4209	138	91	2.14	40	68	No
90 Courtney dr, upper coomera QDL 4209	112	91	2.05	42	68	No
76 Courtney dr, upper coomera QDL 4209	103	91	2.01	43	68	No
68 Courtney dr, upper coomera QDL 4209	111	91	2.05	42	68	No
64 Courtney dr, upper coomera QDL 4209	145	91	2.16	40	68	No

The estimated noise levels for the receivers considering the distance between the noise source and the Sensitive receptors, the calculated noise level is shown in **Table 5.5.** Were values of 73 dB and 77 dB were estimated for three of the receptors, which exceed the maximum permitted level for Noise sensitive premises. However, in any case of noise exceedance identified, the noise management measures mentioned in section 6 will become applicable.

6 Noise Management

Potential construction noise control has been determined in accordance with the guidance of *Australian Standard 2436- 2010 Guide for the control of noise and vibrations in construction, demolition, and maintenance works*, which describes various sources of noise, possible solutions, and their effectiveness. Proposed Controls have also been drawn from the noise assessment.

To effectively manage the impacts of noise on surrounding sensitive receptors and reduce impacts as much as practically possible, the following management methods have been produced to the place:

- All machinery/ equipment proposed across the site will be used in accordance with appropriate manufactures instructions;
- All machinery/ equipment will be kept up to date with service and maintained to ensure no excess noise emissions are received;
- Any non-operational personnel or stakeholders will be required to undertake a site induction to ensure compliance with this management plan;
- Working hours will be as described in Section 2.4 of this report;
- Where a particular machine or activity is found to generate noise levels that exceed the criteria, it may be possible to select an alternate approach or machine. During the Construction works, the equipment will be as quiet as practically possible. All equipment which is used will be maintained to the highest standards throughout the Construction activities or operator to ensure optimum noise attenuator.
- Equipment will be switched off when not in use;
- Where machinery projects noise in a preocular director, the machinery will be positioned as not to direct the noise towards sensitive receptors;
- The use of horns and audible signals will be limited as much as practically possible;
- Equipment will only be used during permitted hours;
- Good relationships must be established with people close to the workplace from the beginning of the project and maintained throughout the project, as this is of utmost importance.
- Where the use of excavators is to be utilised, aggregates within the bucket should not be allowed to fall from excessive heights;
- Temporary screening will be installed around high-risk activities, including the use of saw cuters and excavators during non-standard hours and the use of generators where applicable;
- All site supervisors, contractors and workers will be made aware of the noise limits established for the site and noise control measures to be implemented; and

- Project Managers should review daily expected noise emissions from activities and prepare options for noise control, providing respite to specific noise-sensitive areas when possible.
- All events exceeding chosen trigger levels will be logged, the email alert system will be activated, and all required personnel will be notified as soon as possible. **Appendix B.**

7 Noise Control Methods

Noise control methods available for the site are outlined below.

7.1 Acoustic Barriers

Barriers or screens can be effective in reducing noise levels and can be located at either the source or the received. Barriers at the source are generally only effective for static equipment. The degree of noise reduction achieved is dependent on the extent to which the line of sight is blocked. During work, ear plugs can also be used by project's personnel as a barrier to reduce the effects of elevated noise. If required, ear plugs could be also offered to receptors for short duration of very loud activities.

7.2 Site induction and training

All site supervisors, contractors, and workers will be made aware of the noise limits established for the site and noise control measures to be implemented. Project Managers should review daily expected noise emissions from activities and prepare options for noise control, providing respite to specific noise-sensitive areas when possible.

7.3 Safe work distances

Proposed equipment to be used during the project will be located as much distance as possible between receivers and the working area.

7.4 Strategic Positioning of Processes on Site

Strategic positioning involves formulating work practices to reduce noise exposure at sensitive receptors in close proximity to operations. The following procedures will be adopted on site:

- Where possible, noisy equipment will be located away from sensitive areas, and doors will be ensured to be closed at all times,
- Equipment known to emit a lot of noise in one direction will be oriented so that the noise is not directed towards sensitive receivers, where possible.

7.5 Relative Effectiveness of Noise Control

Implementation of noise control measures, such as those suggested in Australian Standard 2436-2010 "Guide to Noise Control on Construction, Demolition and Maintenance Sites", are expected to reduce predicted construction noise levels. **Table 7.1** below presents noise control methods, practical examples, and expected noise reductions according to AS 2436-2010.

Table 7.1 Relative effectiveness of various forms of noise control

Group	Practical Examples	Typical Noise Reduction Possible in Practice (L_{pA} dB)	Max Noise Reduction Possible in Practice (L_{pA} dB)
Distance	Doubling of distance between sources and receiver	6	6
Screening	Acoustic barriers such as earth mounds, temporary or permanent noise barriers	5 - 10	15
Acoustic Enclosures	Engine casing lagged with acoustic. (insolation and plywood)	15 - 20	50
Engine Silencing	Residential class mufflers	5 – 10	20

7.6 Personal Protective Equipment

Personal hearing protectors should be selected and maintained in accordance with AS/NZS 1269.3 Occupational noise management – hearing protector programme; When selecting personal hearing protectors, Consider the necessary attenuation, avoid overprotection, Adapt the protectors to the environment and tasks, manage use and disposal, Evaluate the frequency of use, evaluate comfort and fit, and clearly signal areas requiring hearing protection. Recommended class of hearing protector is included in **Table 6.2**. Class 5 hearing protectors are recommended for workers on this project.

Table 6.2. Recommended class of hearing protector

Measured exposure $LL_{AAAAAA,8888}$ Db (A)	Class
Less than 90	1
90 to less than 95	2
95 to less than 100	3
100 to less than 105	4
105 to less than 110	5

7.7 Administration procedures

Administrative procedures for the general management of a site relate to general measures which may be used to reduce noise impacts. Administrative procedures shall include:

- Provide induction to site personnel addressing the requirements of the NMP and their responsibilities regarding noise and vibration management ensuring:
  - Work occurs within approved hours.
  - Appropriate mitigation and management measures are being utilised- where necessary
- Provide ongoing education of supervisors, operators, and sub-contractors on the need to minimise noise through toolbox meetings and on-site training;
- Provide a protocol for handling noise complaints that includes recording, reporting, and acting on complaints.
- Organise work to be undertaken during the Standard hours where reasonably practical and safe to do.

8 Stakeholder consultation

For the management of noise levels to be effective, it requires continual and direct communication between the contractors, the Local Government Authority, and any other affected parties. This communication link establishes a dynamic response process that allows for the adjustment of work methods and criteria for the benefit of all parties impacted by the proposed activities. An example of a notification letter has been presented in **Appendix C**.

The objectives of the community contact procedure are to:

- Inform all groups about the project and the particles noise control being implemented;
- Increase understanding of potential impacts associated with activities involved during the construction work;
- Identify community concerns so that they can be addressed.

The relevant identified stakeholders of this project include:

- Sensitive receptors within 200m radius of the project area;
- Adjacent residents to the project area;
- Indirectly affected members of the public; and
- Government departments.

8.1 Complaints Management

The client will implement a firm commitment to best work practices, i.e. such that scheduling of activities and selection of equipment are considered to minimise the potential impacts. A community contact/complaints process will be established by the client, whereby the Site Supervisor/ Project Manager ensure any complaints regarding environmental noise levels are recorded, investigated, and followed up with the complainant. The receivers to be notified of remediation works will be based on identified sensitive receptors within section 4 of this NMP. Information regarding any complaints of exceedance of noise levels events must be documented and passed onto the Project Manager for review and action as soon as possible. The following information will be recorded in the incident register. A noise incident register will be maintained as illustrated in **Appendix B.**

The complaints procedure includes:

- Registration of complaint;
- Name and contact details of complainant;
- Date and time of complaint and date and time of occurrence of issue;
- Details of complaint and effect of noise on property.
- Identification of source;

- Assessment of level;
- Corrective action to mitigate emission if found to be unreasonable;
- Re-assessment to ensure control procedures implements are successful;
- Follow up with complainant; and Close-out.

At the time of receiving the complaint, the client will offer an explanation for the nuisance, if possible. If an explanation cannot be made the person receiving the complaint shall advise the complainant that the matter will be investigated, and the complainant will be notified of the outcome or appropriate action taken.

8.2 Roles and Responsibilities

The roles and responsibilities associated with the implementation of this noise Management Plan, and the point of contact for any complaints, will be the Project Manager/Director. Details are as per **Table 8.1** below.

Table 8.1. Contact details for complaints

Name	Title	Contact number	e-mail
Michael Williams	Senior Project Manager	0472 723 733	michael.williams@winslow.com.au

END OF MANAGEMENT PLAN

DISCLAIMER

This Management Plan is prepared for a particular client objective and is formulated on this basis only. All limitations and conditions in the writing of this Management Plan are clearly agreed to by the client and Winslow prior to its formulation and may not be suitable or applicable for any other use other than that of the original intended objective. No other parties other than the client and Winslow should use this information without firstly conferring with Winslow.

Whilst all due care is taken any information within this document that has relied on information from previous assessments made by others including visual inspections, laboratory testing, and overall methodologies cannot be guaranteed for its accuracy or competency by Winslow.

This Management Plan should be reproduced in full at all times when either reviewed or accessed. If the Management Plan is to be used by a third party for whatever means the scope and limitations of the document should be clearly defined to the third party.

Figure 1 – Site Location

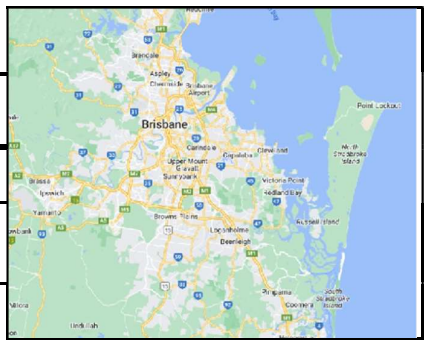
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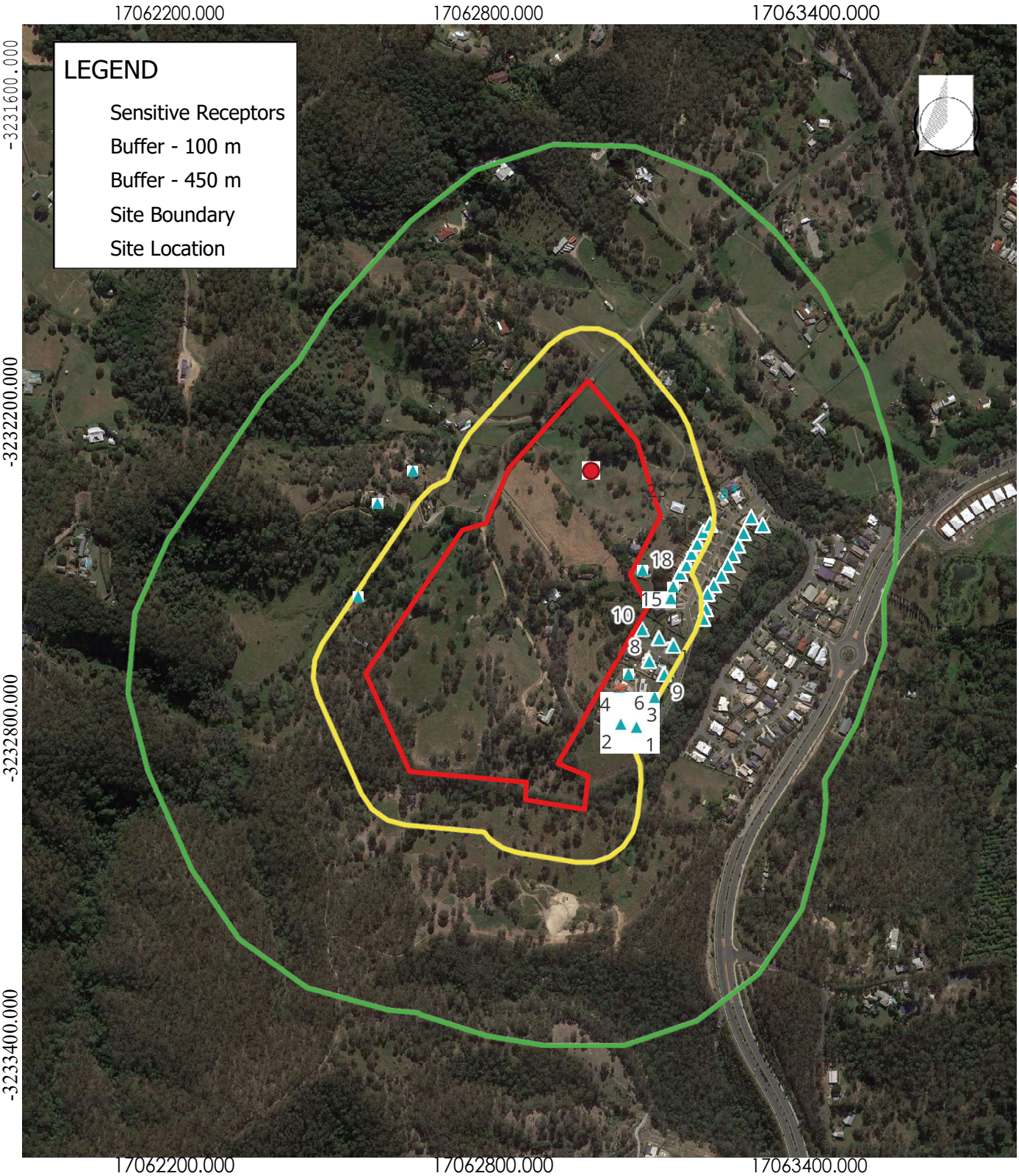
TITLE	Figure 1. General Site Location		
PROJECT	Courtney Drive Upper Coomera QLD 4209	PROJECTCODE	170642
DESIGN/DRAW LM |	Checked By BD	)VERSION 00	DATE 28/11/2023
PREPARED BY	Source	NearMaps	
	Scale		



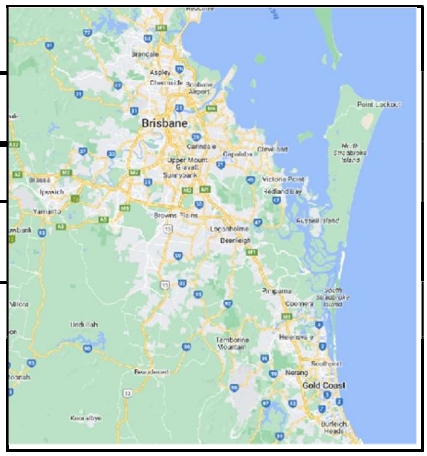
PREPARED FOR

0 5 10 km

Figure 2 – Sensitive Receptors



TITLE	Figure 1. Sensitive Receptors - Bufferd 100 m			
PROJECT	Courtney Drive Upper Coomera QLD 4209		PROJECTCODE	170642
DESIGN/DRAW	LM | Checked By BD	VERSION 00	DATE	28/11/2023
PREPARED BY		Source	NearMaps	
		Scale	0 5 10 km	
PREPARED FOR				



Appendices

Appendix A – A-weighted sound pressure levels

Calculate A-weighted sound pressure levels at the receiving position from each on-site machine and on-site process individually. (*AS 2436:2010*) The A-weighted sound pressure level was calculated in **Section 5** of this document. Assigned Levels were calculated incorporating an Influencing Factor from Part 1, Item 8 Assigned Levels (Table 1) as per The Regulations. The results were completed using the below calculation. The results of this calculation are shown in **Table 5.4** and **Table 5.5** of this Noise Management Plan.

$$LL_{pppp} = LL_{wwpp} - 20\ llll_{10}RR - 8$$

- A-weighted Sound Pressure Level – LL_{pppp}
- Distance from the source – R
- A-weighted Sound Power Level – LL_{wwpp}
- Hard ground

The following table is used to establish the cumulative sound pressure as if all machinery were working concurrently.

Method:

Add the higher of the individual levels to a factor reflective of the difference between the two levels.

Table A-1 Addition of Total Sound Pressure Levels *(AS 2436:1020)*

Difference between the two levels (dB)	Addition to higher level (dB)
0	3
1	3
2	2
3	2
4	1
5	1
6	1
7	1
8	1
9	1
10	0

Transport Noise Management Code of Practice - Volume 2 (2016)

Sensitive land uses have the potential to be impacted by construction noise and vibration. Sensitive land uses/receptors considered in this Code include:

Noise-sensitive premises

- a dwelling (detached or attached) including house, townhouse, unit, reformatory institution,
- caravan park or retirement village;
- a library, child care centre, kindergarten, school, school playground, college, university,
- museum, art gallery or other educational institution, hospital, respite care facility, nursing
- home, aged care facility, surgery or other medical centre;
- a community building including a place of public worship;
- a court of law;
- a hotel, motel or other premises which provides accommodation for the public;
- a commercial (office) or retail facility;
- a protected area, or an area identified under a conservation plan as a critical habitat or an
- area of major interest under the Nature Conservation Act 1992;
- an outdoor recreational area (such as public park or gardens open to the public, whether or not on payment of a fee, for passive recreation other than for sport or organised entertainment) or a private open space.

While outdoor recreational areas are considered to be noise and vibration sensitive sites, for the durations involved in construction activities, it is not considered necessary or justified for mitigation measures to be required.

Critical facilities, infrastructure and utilities

This Code defines critical facilities, infrastructure and utilities (critical receptor) as those buildings, infrastructure and utilities which, by their nature or by the nature of the activities conducted therein, are particularly sensitive to disruption due to construction noise and vibration effects, or where the consequences of such disruption would be severe. Critical facilities, infrastructure and utilities are a subset of sensitive receptors and include the following:

Critical receptors

- Critical facilities include medical/health buildings, educational/research facilities, courts of law and community buildings. The latter three are only considered when in use. Critical facilities are usually sensitive to both construction noise and vibration.
- Critical infrastructure and utilities include dams, electrical and telecommunications facilities (including railway signalling systems), oil and gas pipelines and other petrochemical installations and utilities such as water mains and sewers. Critical infrastructure and utilities are typically sensitive to construction vibration. Volume 2 – Construction Noise and Vibration: Chapter 3 – Criteria Transport Noise Management Code of Practice, Transport and Main Roads, March 2016 21;
- Other facilities, infrastructure or utilities (for example bridges) which may be deemed to be of critical importance on a project-specific basis.

Appendix B – Noise Incident Register

Number	Incident Date	Reported By (Name & Contact Details)	Duration of Incident	Description of Incident	Location of Incident	Management Controls Employed	Date Completed
		Name: Contact Number:					
		Name: Contact Number:					
		Name: Contact Number:					
		Name: Contact Number:					
		Name: Contact Number:					
		Name: Contact Number:					
		Name: Contact Number:					
		Name: Contact Number:					
		Name: Contact Number:					

Appendix C - Example Notification Letter

Construction Works at Courtney Drive Upper Coomera

Dear Occupant,

(**Insert site address**).

Winslow has scheduled remediation works at Courtney Drive Upper Coomera Queensland 4209. Construction activities will be conducted on (**Insert date**) commencing at (**Insert hour**) and concluding on (**Insert date**) according to the following schedule:

Date	Schedule	Activities to be completed	Potential impact
(**Insert date**)	(**Insert period /time**)	(**Insert description of activity**)	

This letter has been developed to advise you that these works will be undertaken within the vicinity of the project, generally for (**Insert number**) days with the dates and locations above provided as a guide only. Some changes may be required without notice depending on specific conditions, productivity, and other logistical considerations.

We appreciate your cooperation and patience while these project and related works are undertaken.

Where you have queries in relation to these works, please do not hesitate to contact us as per the contact details provided below.

Kind Regards,

Winslow
Building 4; G1; 107 Miles Platting Road, Eight Mile Plains QLD 4113
T: (0) 7 3426 4000
F: +61 491909229
E: Headoffice@ccawinslow.com.au
W: www.winslow.com.au

APPENDIX K

TRAFFIC MANAGEMENT PLAN

TRAFFIC MANAGEMENT PLAN

HAULAGE PLAN FOR NEW DEVELOPMENT

COURTNEY DRIVE, UPPER COOMERA

Requested by:

OPT HIRE
Address: 2/38 Computer Road, Yatala QLD 4207
Phone: 1300 678 447
Email: sales@opthire.com.au
ABN: 64 661 787 533

Prepared by:

SITE SERVICES
TRAFFIC MANAGEMENT PROFESSIONALS
Address: 1/453 Newman Rd Geebung 4034 QLD
24/7 Ph: (07) 3265 7403
Email: ops@siteservicesqld.com.au
ABN: 73-159-219-806
TMR Regitration: 0173
Labour Hire Number: LHL-01690-L4V4C

Author:
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M: 0474 900 215
E: adam@siteservicesqld.com.au

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1 Document Issued Management

Version	Author/Approver	Signature	Description	Date
0	Adam Stahlhut - OP 558		Initial Release	17/01/2024

2 Project Details

Project Name	Haulage Plan
Construction Type	New Development
Principal	Gold Coast City Council
Principal Contractor	OPT HIRE
Project Location	Courtney Drive, Upper Coomera
Contract Number	TBD
Contract Date	TBD
Project Duration	TBD

3 Reference/Abbreviation/Terminologies

Abbreviation/ Terms	Description
QMUTCD	Queensland Manual of Uniform Traffic Control Devices and has precedence over the AS1742
GTMWR	Guideline Traffic Management at Works on Roads
MRTS02	Transport and Main Roads Specifications MRTS02 Provision for Traffic- July 2020
TRSBS	Road Safety Barrier Systems and End Treatments (Assessed as compliant with AS3845:1999) and Other Related Road Safety Devices
TCASAP	Traffic Controller Accreditation Scheme Approved Procedure (PDF, 0.95 MB)
TORUM	Transport Operations (Road Use Management) Act 1995
TORUM Reg	Transport Operations (Road Use Management—Road Rules) Regulation 2009
AGTTM	Australian Guide to Temporary Traffic Management Parts 1-10
QGTTM	QLD Guide to Temporary Traffic Management Parts 1-10 and has precedence over AGTTM
AS1742.3	Manual Of Traffic Control Devices Part 3 Works on Roads
TRUM	Traffic and Road Use Management Manual
WHS Act	Work Health and Safety Act 2011
The Code	Traffic Management Construction COP-2008
RPEQ	Registered Professional Engineer of Queensland
Shall / Must	A mandatory condition, indicates that the guidance must be followed
Should	Indicates a recommendation, any recommendation that is not applied must be based on sound engineering judgement and documented
TC sign	Traffic Control sign
TGS	Traffic Guidance Scheme
TTM	Temporary Traffic Management
TMD / Designer	Traffic Management Designer
TMS	Traffic Management Software
DTMR/TMR	Department of Transport and Main Roads (Metropolitan)
MRTS	Main Roads Technical Specification
QPS	Queensland Police Service
TMD	Traffic Management Designer
TMI	Traffic Management Implementer
TGS	Traffic Guidance Scheme

Abbreviation/ Terms	Description
TMP	Traffic Management Plan
TSB	Temporary Safety Barrier
VMS	Variable Message Sign
SWMS	Safe Work Method Statement

4 Introduction

This TMP aims to provide the following;

- safe work environment and manage the risks through current jurisdictional Work Health and Safety (WHS) requirements, regulation, training and roadwork planning. Safety is of the highest priority in preparing this TMP.
- to manage and minimize the impact of road works to all road users particularly vulnerable road users (e.g pedestrians, people with disabilities, cyclists and motorcyclists), traffic congestion and the general community.
- Vulnerable road users are efficiently and safely guided past, around or through the work site.

Site Services Traffic Management Professionals has been engaged by OPT HIRE to organize a traffic management plan for the new development works at Courtney Drive, Upper Coomera.

TMP and TGS contained in this document have been prepared by Site Services Queensland and authorized by Adam Stahlhut (TMD OP558).

All TGS are contained in Appendix C and have been designed by Adam Stahlhut (TMD OP558), Resume contained in Appendix B.

5 Objectives

The objectives of this Traffic Management Plan are to:

- Identify and manage risks.
- Provide protection to road users.
- Layout on how to implement the works onto the existing road conditions.
- Provide protection to workers on worksite.
- Provide guidance to road users and to minimize potential adverse impacts on traffic flow.
- Provide communication and arrangement to affected communities.
- Provide a safe work environment to both workers and the general public.

6 Scope of Works

OPT Hire will undertake new development project at Courtney Drive, Upper Coomera where temporary vehicular access points and frequency of use (Haulage Plan) is required.

Traffic Guidance Scheme for the haulage plan is provided and detailed in this TMP.

7 Statement of Duty Care

Any Person Conducting a Business or Undertaking (PCBU) in connection with or pursuant to TTM and the QGTTM, has a 'duty of care', so far as is reasonably practicable, that the health and safety of workers who work for the PCBU or whose activities in carrying out work are influenced or directed by the PCBU, are not exposed to health and safety risks arising from that business or undertaking.

A PCBU shall ensure, so far as reasonably practicable, that other road users are not exposed to health and safety risks arising from any TTM business or undertaking.

A PCBU includes all types of working arrangements such as crown agencies, organizations, companies, principals, contractors and subcontractors.

8 Site Inspection

- A pre-installation risk assessment prior to the implementation of the TGS is performed by the TMI and recorded to the Traffic Management Register.
- Signs are inspected at least every 2 hours by the TMI and recorded by Traffic Management Software.
- After implementation of each TGS and after any significant changes made, it is inspected by a TMD/Contractor and Traffic Management Software and recorded in the Register maintained by Site Services Traffic Management Professionals.
- TMI/Contractor will inspect the site aftercare arrangement is implemented and will be recorded in the TMS Register which is maintained by Site Services Traffic Management Professionals.

9 Site Induction and Training Plan

9.1 Site Induction

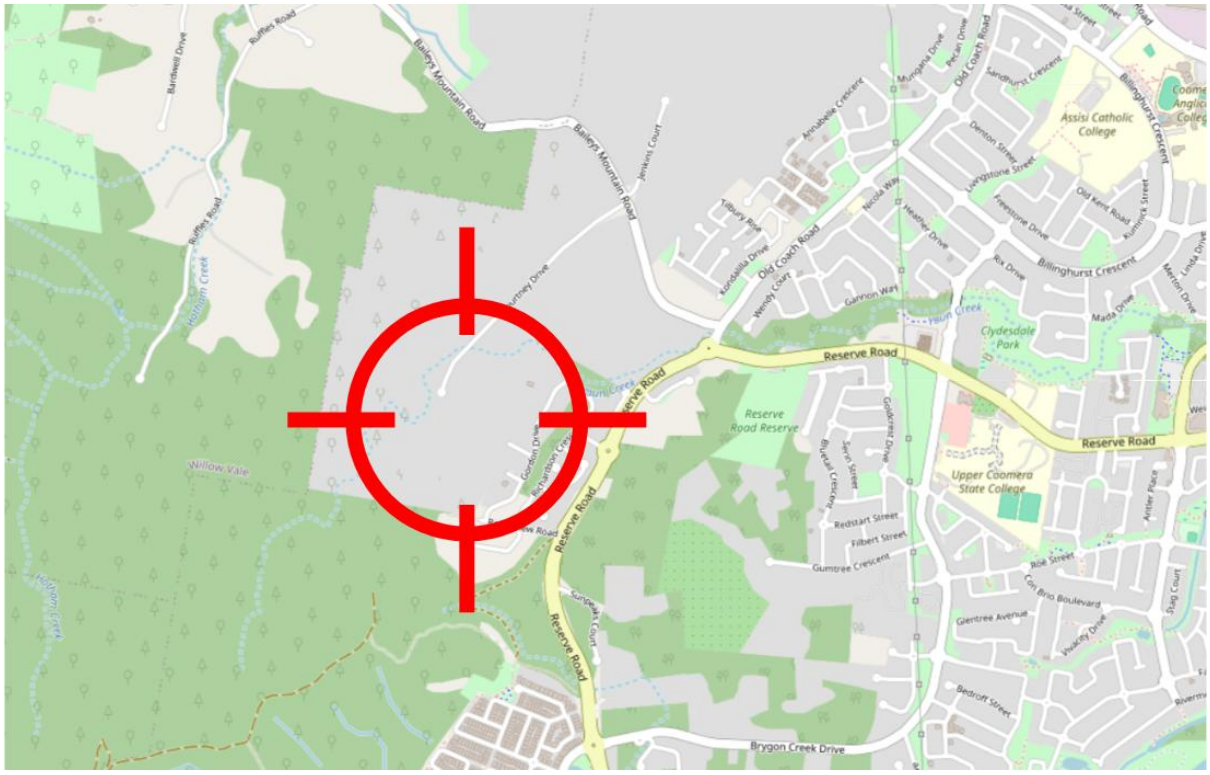
Site Inspection will be conducted prior to preparing the TMP and assess the following:

- Condition of the road
- Probable risk that may arise during the implementation of the work.
- Safe Temporary facilities for worker and visitors
- All site visitors will receive induction training to the site and must ensure that are
- visitors are aware of the construction plan, TMP requirements, procedure and practices.

Role	Training required
TMD	CPCCOHS1001A Work Safely in Construction Industry and White Card Traffic Management Design and Design Card Site Induction SWMS Induction

Role	Training required
TC	CPCCOHS1001A Work Safely in Construction Industry and White Card RIIWHS205D-Control Traffic with a Stop Slow Bat and TC Licence Site Induction SWMS Induction
TMI	CPCCOHS1001A Work Safely in Construction Industry and White Card RIIWHS302D Implement Traffic Management Plan and Implementation card Site Induction SWMS Induction
Site Staff	CPCCOHS1001A Work Safely in Construction Industry and White Card Site Induction
Visitors	Site Induction

10 Project Overview



10.1 Haulage Plan

The sketch of the proposed temporary vehicle access point to the Site Compound and Material Laydown Areas is shown below, which is located at the entry to the Development Site at Stage 1 Courtney Drive, Uppere Coomera. The frequency of use will be guided by the work onsite.

1. Light Vehicles (LV) are to use 79 Courtney Drive as the designated access and exit points

2.Heavy Vehicles (HV) are to use 97 Courtney Drive as the designated access and exit points.

3. Mackellar Drive is to be used when construction of the civil component of works commences. This access point will used for he import materials used in the construction on the project. These materials can range from concreted, road base material, gravel stormwater, water, sewer materials etc. The materials will change depending on the life cycle of the project

4. Rangeview Road is to be use when construction of the civil component of works commences. This access point will used for he import materials used in the construction on the project. These materials can range from concreted, road base material, gravel stormwater, water, sewer materials etc. The materials will change depending on the life cycle of the project

- Access for via Rangeview Road and MacKellar Drive will change depending on the where the project is in its lifecycle.

- On the average there will be 20-30 vehicles using 79 & 97 Country Drive as the access points for the duration of the 29 Weeks (schedule) project. During the road base import operation, its estimated that 6-8 truckloads per hour will be delivered to the work area through Rangeview and MacKellar Drive. During the concrete items i.e. stromwater structures, sewer structures, footpaths, kerb, and so on the requirements for concrete deliveries may rang from 1 delivery per day (minor works) up to 3 loads per hour during kerb construction.



10.2 Proposed Schedule of Works

SCHEDULE OF CONSTRUCTION				
Activity	Dates	Week Days (Times)	Saturday (Times)	Sunday (Times)
Overall Project	TBD	TBD	TBD	TBD
Stage 1	TBD	TBD	TBD	TBD
Stage 2	TBD	TBD	TBD	TBD
Stage 3	TBD	TBD	TBD	TBD
Stage 4	TBD	TBD	TBD	TBD

11 Consultation, Communication and Project Administration

11.1 Consultation

The following section outlines the key parties and the process of consultation that needs to be adopted to ensure sound communication and smooth running of the project with regards to the planning and implementation of the TGS's.

Traffic Guidance Schemes and Traffic Management Plan shall be submitted to the Administrator at least 21 days prior to implementation and notification shall be provided to the following stakeholders:

- Gold Coast City Council shall be advised of all impending changes to traffic conditions.
- Translink shall be notified in advance if Bus Stop or Bus Route is affected by upcoming works.
- Emergency services shall be notified when required if changes to traffic conditions will affect their route through the site. Best alternate routes are to be provided where applicable.

Complaints received from the general public will always be stored on a register and made available to the Administrator. If any actions are required because of the complaint, the site shall be tool boxed by OPT HIRE. Actions taken involve receiving clear concise details of the complaint, an analysis of site conditions by comparison to the relevant Traffic Guidance Scheme and rectification of any inadequacies. Actions also include reviewing the TGS for suitability given the context of the traffic complaint. Where possible, feedback will be given to the party making the complaint of the nature of rectification.

11.2 Coordination Meeting

- Weekly progress meetings
- Daily pre-start meeting and progress reports

11.3 Pre-Start Meeting

Prior to the commencement of the project, all site traffic management personnel must attend before commencing traffic management duties. The meeting is vital to ensure everyone on site understands activities that are occurring and the responsibilities and roles of people working on the site are made clear prior to work commencing. It is also important to review the prepared approved emergency plan, and a site specific Safe Work Method Statement.

11.4 Communication Processes

- All site emergencies, concerns and issues will be reported to the site supervisor as person in-charge.
- Site supervisor to report immediately to Superintendent any incidents on site.
- Superintendents to report immediately to project manager any incidents on site.
- Designated personnel must register all site incidents.
- Site supervisor to assign personnel for the communication channel such as UHF Radios when there are emergency or changes on site.
- Site supervisor must implement clear signs and full communications on site.
- All vehicles must be equipped with UHF radios.
- Movements on site must be facilitated by traffic control and or designated site personnel with full communication.
- If changes of plans are needed, site supervisor must report to WHS and Emergency Services.
- Plant movement on site must be restricted until instructed.
- Near misses are to be reported to aid in understanding site dynamics and to prepare appropriate mitigations.

11.5 Key Contact Details

Name	Organization	Position	Contact	Email
Robert Gajic	OPT Hire	Project Manager	0460806409	Robertg@opthire.com.au
TBD	OPT Hire	Site Supervisor/ Project Engineer	TBD	LTBD
TBD	OPT Hire	Afterhours Contact	TBD	TBD
Adam Stahlhut	Site Services Traffic Management Professionals	Nominated Traffic Officer	0474 900 215	adam@siteservicesqld.com.au

11.6 Registers

Register type	Entity	Description
Key personnel register		Identify all key personnel and provide contact details for the relevant road infrastructure manager, the affected local government, the client, the main contractor (if relevant), the project manager, the site supervisor and any key subcontractors.

Register type	Entity	Description
Incident register		Record all incidents that occur on site, including date and time of the incident, date stamped photographs of signs and devices in the vicinity of the incident.
Variations register		Record any modifications to approved traffic management treatments, including reason for the modification and departure from this guide, date, time, modification made and residual risk.
Daily inspection register		Record the time and date at which traffic controls were erected at the start of the day, when changes to controls occurred and why the changes were made, and any observations associated with traffic controls and their impacts on road users or adjacent. properties
Complaints register		Record any complaints received including party making the complaint, contact details, nature of the complaint, and any follow up actions that have been identified and subsequently taken.
Consultation register		Identify and provide contact details for the stakeholders who have been consulted during the preparation of the TMP. Also provide an overview of the main issues raised during consultation.
Traffic Management Audit		Inspect and record the results of a traffic management audit.

12 Roles and Responsibilities

Role	Qualifications Required	Activity	Training Required for the Activity
Traffic Controller	RIIWHS205E – Control traffic with stop slow bat License RIIWHS207 – Control traffic with portable traffic control devices and temporary traffic signs1 License	Stop traffic with a stop slow bat or PTSS1	Traffic Management Induction
Traffic Management Implementer	RIIWHS302E – Implement TMP and TGS, Implementation Card	Traffic Management Plan Implementation	SWMS Induction
Traffic Management Designer	RIICWD503E – Prepare work zone TMP and TGS RIIRIS402D – Carry out the risk management process Traffic Management Design and Design Card	Designs and Approve TGS, TMP	Site Induction
SWMS Personnel	CPCCOHS1001A Work Safely in Construction Industry and White Card	To be on site	Manual Handling

12.1 The Project Manager

The project manager is the person responsible for the management of the TTM for the whole duration of the project.

The responsibilities of the Project Manager include;

- Fully aware of the information of the scope of works and the work staging to appropriately plan the traffic management arrangements and design the TGS.
- Always available for contact to all traffic related matters.
- Has the responsibility and authority to ensure the TMP is implemented for the prevention of property damage and injury to employees, contractors, subcontractors, road users and all members of the public.
- Management of the traffic incident and emergency response procedures.
- Management of the communication with operational and community stakeholders.
- Management of the traffic management activities with supervisors.
- Maintenance of the operational and community stakeholder contact details.
- Ensure all site personnel are fully aware of their responsibilities and traffic controllers are appropriately trained and accredited.
- He will ensure that sufficient controllers are available to ensure appropriate breaks are taken.
- Prepare a written Work Health and Safety Management Plan in accordance with the regulation before work on the project commences.
- Ensures appropriate personnel are all aware of the know their responsibilities for the Work Health and Safety Management Plan.
- Maintenance of the out of hours contact representative details.
- Attend regular project and traffic meetings for the purpose of updating the project team on programming and ensuring the requirements of TMP are met.
- Assign roles and responsibilities.

12.2 Site Personnel

All personnel engaged in the field activities will follow the correct work practices as required by the QGTTM/QMUTCD. The approving authority shall be notified should a situation arise that is not covered by this TMP or the QGTTM/QMUTCD.

12.3 Site/Traffic Supervisor

The Contractor will appoint a Site/Traffic Supervisor who shall undertake a review of the erected signage to ensure compliance with the approved TGS and shall maintain detailed daily records. This person shall hold a current QLD approved RIIWHS302D Implement Traffic Management Plans qualification. Traffic Guidance Scheme record keeping will be undertaken in accordance with the QGTTM.

12.4 Traffic Management Responsibilities

12.4.1 Principal Contractor

It is a primary responsibility of a Principal Contractor to oversee the overall site activities, safety and ensure that the TMP and TGS meet the requirements stated in the QGTTM. Moreover, it is the Principal Contractor's duty to submit plans for a safe work environment that reduces hazard and risk to both workers and road users.

- The Principal Contractor ensures to:
- The Traffic Management Plan and Traffic Guidance Scheme follows standard, and principle stated in QGTTM.
- Conduct daily Pre-start meetings.
- Ensure clear understanding with the private property, business owners and emergency services for access during work.
- Provide Safety and a healthy work environment for all workers and personnel.
- Requires all worker's qualification/competency/license for the task they are performing.
- Contact with Emergency Services and provide procedures for the Emergency Plan
- Regularly assess work procedures and practices
- Create extensive awareness of the works and its associated impact.
- Provide an emergency evacuation site, evacuation training, equipment, plans, signage and support.
- Consult and notify QLD transport agencies and operators.
- All workers have access to information and understand clearly the requirements of the Traffic Management Plan
- New on-site workers undertake and completed a site-specific induction.

12.4.2 Traffic Management Company

Site Services Traffic Management Professionals will designate competent persons to install/uninstall and monitor traffic guidance scheme set-up on site.

Any changes required on site, OPT HIRE to inform Site Services Traffic Management Professionals. Site Services Traffic Management Professionals will amend TMP and TGS and acquire necessary permits and approvals.

OPT Hire will ensure compliance with a Safe Work Method Statement (SWMS) for traffic management practices. Site Services Traffic Management Professionals then provide a qualified traffic management implementer to assess traffic arrangements prior to installation associated with the risk assessment conducted prior to the traffic management plan design. Any issues that arise on site must be recorded on SWMS and the principal contractor register. Changes of design are subject to risk assessment and approved by a qualified TMD.

12.4.3 Nominated Traffic Officer

Traffic officers will be supplied by the Site Services Traffic Management Professionals for the duration of the project, Site Services Traffic Management Professionals with TMR Registration: 0173 is a registered QLD traffic management. Project's Traffic officer must hold Traffic Management Design open qualification (see Appendix C) and is the approver for the project Traffic Management Plan and all Traffic Guidance Schemes. Other responsibilities of a Traffic Officer includes:

- Maintain currency of permits and provide copies to all relevant parties.
- Traffic controllers have been inducted to site.
- Traffic controllers have current and suitable qualifications. A copy of qualifications is to be held in a register.
- Signage and devices placed as per QMUTCD, on site Risk Assessment and RPEQ requirements.
- Obtaining Permits from the relevant authorities'/road asset owners including DTMR, Local Council and QPS.
- Obtain all information regarding project site either by a site visit or getting required information from Traffic Project Manager

12.5 Traffic Control

OPT Hire will engage Site Services Traffic Management Professionals, a registered traffic control company to undertake any traffic control and traffic management implementation duties. They will be registered with the QLD Traffic Management Registration Scheme.

Traffic Controllers must always comply with strict operational and safety requirements whilst controlling traffic. These requirements are set out in the *Traffic Controller Accreditation Scheme Approved Procedure* and this Part of the *Manual*.

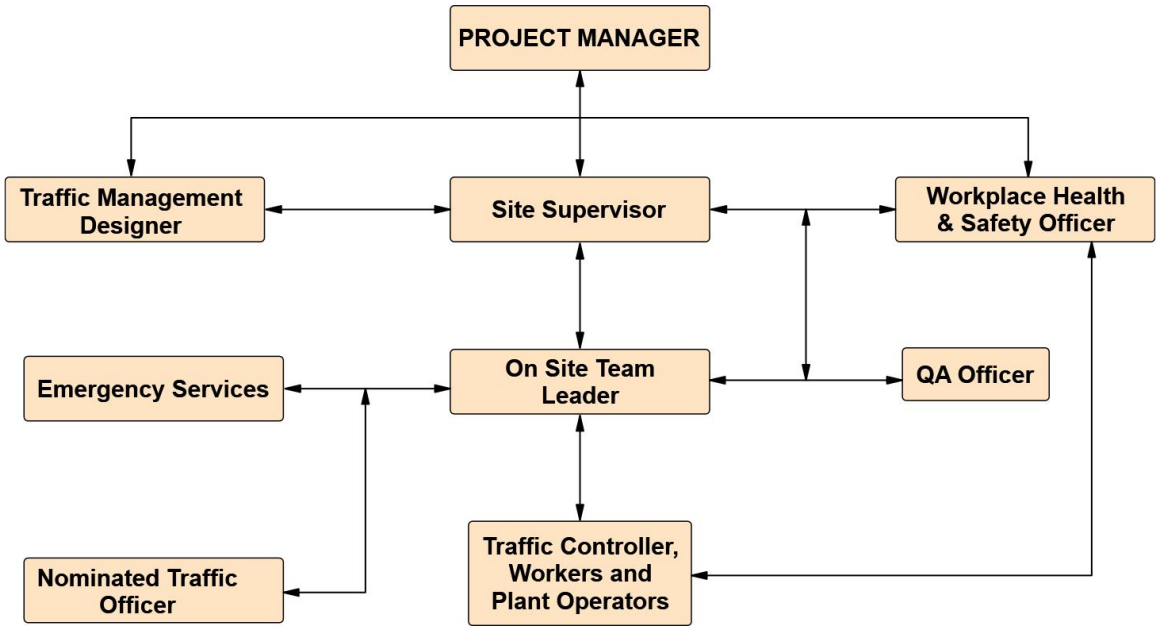
An accredited Traffic Controller is authorized to control traffic:

(a) At road worksites where a road closure or part road closure is necessary.

(b) At other events on the road where a road closure or part road closure is necessary.
(c) In other circumstances where traffic control is required on a roadway.
Traffic Controllers are to;

- comply with the statutory conditions of their accreditation.
- Direct traffic as required under QGTTM and TCASAP

12.6 Traffic Project Team Chart



13 Work Health, Occupational and Safety Method Statement

Under Queensland Work Health and Safety Regulations 2011 working on or adjacent to a road is defined as a high-risk construction activity. High risk construction activities require a Safe Work Method Statement (SWMS) to be documented to identify the high-risk work, specify relevant hazards, appropriate control measures and their implementation and monitoring and review.

Prior to the commencement of this activity The Contractor will compile a Safe Work Method Statement (SWMS) for this project. The contractor traffic management practices require that the Traffic Controller's evaluate all traffic arrangements before they are open to traffic, immediately following the opening to traffic and periodically throughout the activity. Adjustments are recorded in the SWMS, including reasons for the changes and are lodged withOPT HIRE. New hazards that arise throughout the work will be subject to risk assessment and incorporated into the SWMS.Traffic Controller must have a break every 2 hrs.

13.1 Personal Protective Equipment and Clothing

Because of the potential hazards associated with working on or adjacent to road and bridge work sites, all persons working on or authorized to enter such work sites shall be supplied by their employer with the relevant high-visibility protective equipment and clothing and shall be instructed to always wear the same when required.
This equipment and clothing shall comprise the following items:

- Safety glasses night/day
- Hard hat with brim
- Broad brimmed hat (
- Bio-motion long sleeve shirt
- Bio-motion long sleeve pants
- Gloves
- Safety boots
- Approved skin protection (sunscreen)

13.2 Incident and Accident Management

In an event of incident and accident, the emergency response team has the ultimate control and management of the response of the area of incidents. The project management shall recognize the importance of cooperation to all agencies responsible to clear the incidents immediately.

Site supervisor has the responsibility to report to QLD Police, TMR and or local council. All works will be stopped, if possible, the Traffic guidance scheme will be removed and replaced by available traffic guidance scheme to assist the emergency response team for immediate clearance of the incident site. The site is to be cleared of any disruptions to traffic flow. This may involve techniques including use of tow trucks to move broken down or damaged vehicles and persons. Where traffic flows are disrupted, implementation of emergency traffic control plans may be required with priority given to specific traffic streams as necessary. A copy of the incident log shall be forwarded to the Road Authority within 24 hours of the incident, and at other times upon request by the Road Authority.

13.3 Damage to Properties

In the event of damage to properties, all works, vehicles and machines will stop immediately and clear the area as quickly as possible. Traffic controllers and other designated personnel shall be deployed immediately to ensure no road users are to enter the area. All affected properties will be treated equally. QLD Police Services and relevant authority shall be notified immediately. All site personnel shall be briefed on evacuation and control procedures.

13.4 Emergency Response

- All work must be stopped and given full access to the emergency response team.
- Emergency Response Team Plan must be implemented immediately.
- Provide full access to the emergency response team.
- Site Supervisor must report the emergency to project manager immediately.
- Provide emergency procedures and ensure all staff have read and understand the contents.
- All vehicles to safely removed from the site.
- If required, Site Supervisor to implement evacuation as per direction in the pre-start meeting.
- Work will not resume unless clearance is given by the Emergency Response Team.

13.5 Emergency Response Contact Details

- Gold Coast Emergency Contact: 1300 465 326 or 07 5629 5629
- Request Urgent Assistance: Triple Zero (000) for all life-threatening emergencies.
- Gold Coast University Hospital General enquiries: 1300 744 284

13.6 Initial Response

The initial response will generally be obtained by whatever means is available on the fire extinguisher, first aid kit, equipment and devices. QLD Police, emergency services trained personnel are expected to respond first on the site of the incident, they are to remain on site when required.

14 Risk Management and Risk Management

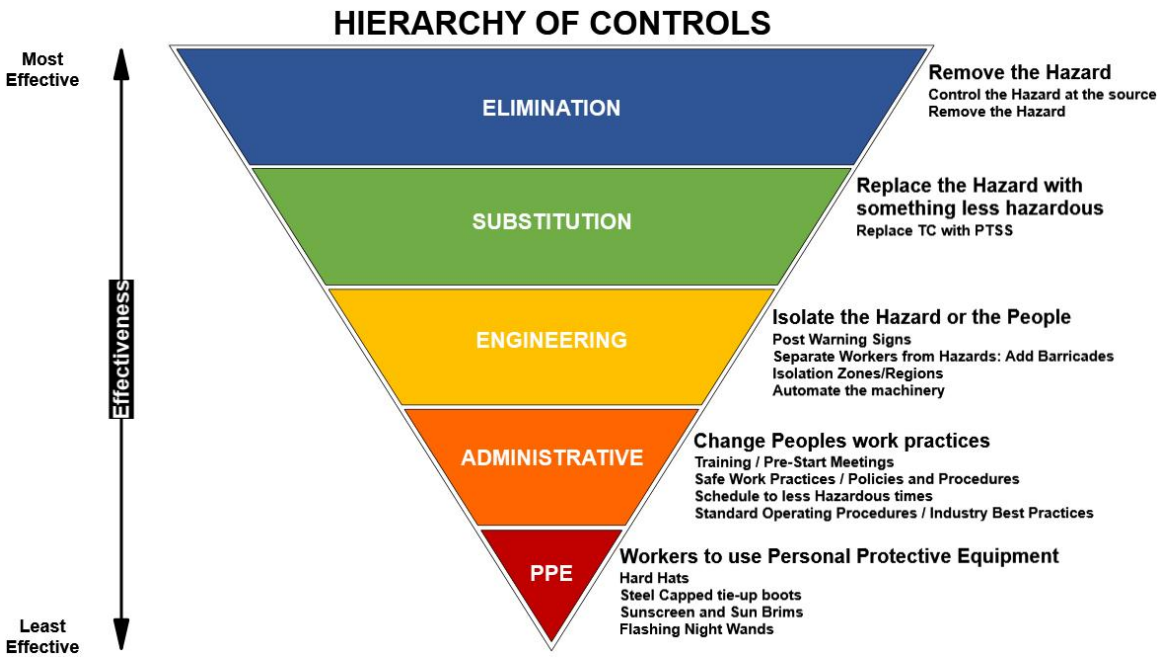
All work activities are subjected to risk assessment process in accordance with QGTTM Part 10 2.4.4. And all risk assessment must be recorded by the designated project personnel. Risk assessment plays an important role to minimize the risk and impact to community and road users.

14.1 Risk Assessment Process

- **Identify Hazards:** Find out what could cause harm.
- **Assess Risks:** Understand the nature of the harm that could be caused by the hazard, how serious the harm could be and the likelihood of it happening,
- **Control Risks:** Implement the most effective control measure that is reasonably practicable in the circumstances:
- **Review Control Measures:** Review control measures to ensure they are working as planned.

The control measures to be implemented have been ranked as per the Hierarchy of Control from most desirable to least desirable.

14.2 Hierarchy of Control



14.3 Risk Matrix

LIKELIHOOD (**A**)	CONSEQUENCES (**B**)				
	Cat Catastrophic Disaster	Maj Major Environmental Harm	Mod Moderate Environmental Nuisance	Min Minor Insignificant Effect	Ins Insignificant Day to Day Issue
1 -Almost Certain	VH	VH	H	H	M
2 - Likely	VH	VH	H	M	L
3 - Possible	H	H	M	L	L
4 - Unlikely	H	M	L	L	L
5 - Rare	M	L	L	L	N
VH - Very High H - High M - Medium L - Low I - Insignificant (**C**)					

**if any risks are determined to fall within the Very High, High or Medium categories then the site risk rating should be revised to High and the level of planning reviewed accordingly. This then requires the Traffic Management Designer (TMD) to revisit and assess the traffic management options from the planning stage rather than attempting to address and mitigate each risk individually.*

14.4 Treatment Options

The selection of final options will depend on many site-specific conditions, and the road infrastructure manager must be assured all factors have been thoroughly considered and addressed through the TMP.

Treatment	Definition
Around the site	This is the first preference and eliminates the risk to workers in the first instance by removing traffic from the worksite entirely by diverting it around the work. There are two primary options in this

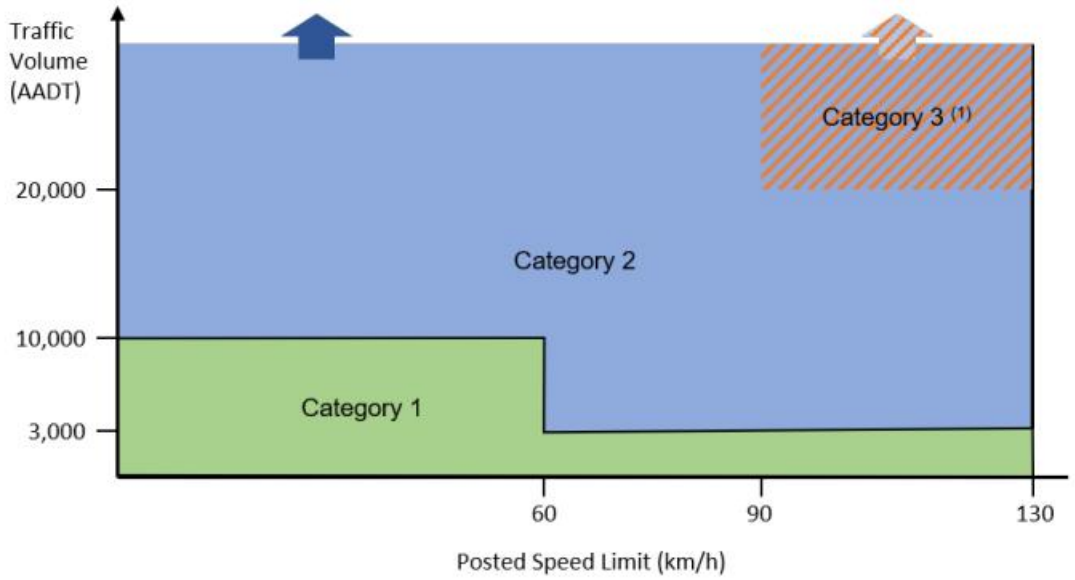
Treatment	Definition
	category. Requirements and recommendations for the operation of side-tracks and detours are given in QGTTM Part 3. **Detour** – diverting traffic by other roads in the road network, ensuring there is no traffic in the vicinity of the worksite, also considering impacts on pedestrians and cyclists. A detour may include a contraflow and the diversion of traffic onto the opposing carriageway where the median contains a barrier or is wider than 6 meters. **Sidetrack** – a specially constructed section of road to divert traffic, eliminating the risk to workers.
Through the work area	Workers to work in a safe environment without exposure to traffic. Traffic is periodically stopped by traffic controllers to allow the work to progress without exposure to traffic, and traffic is then released through the worksite when workers have vacated the works. A pilot vehicle may be required to lead traffic along the desired path and control its speed. For short term and low impact works, the works methods are set out in AGTTM Part 5 and for static worksites see QGTTM Part 3.
Past the work area	This is the final level of control and the most common form of controls used at most worksites, where complete elimination of traffic is not practical. Although this form of control is the most common, it is important that the planning process justifies this treatment option due to the substantially higher risks that road workers are exposed to. In this form of traffic control, traffic is separated from workers either by a physical barrier or through the means of a separation space. This separation may be achieved by a combination of lateral separation, clean warning and delineation. Requirements and recommendations for this method of hazard control is given in QGTTM Part 3.
Short term / low impact	Controls applied in these situations recognize that the nature of the works is of such low impact that implementing a complex traffic management scheme is likely to increase the overall risk for all workers at the site. Traffic management under the 'through' and 'past' categories can apply in a short term / low impact situation. For short term and low impact works, the works methods are set out in QGTTM Part 5 and for static worksites see QGTTM Part 3

14.5 Suggested Treatment Approach

Risk	Suggested Treatment Approach	
Very High	Unacceptable. Must be corrected.	Significant and urgent action is required to eliminate the safety risk or reduce the consequence or likelihood of the risk and overall risk exposure.
High	Should be corrected or the risk significantly reduced, even if the treatment costs are high.	Immediate action is required, and effort must be made to ensure that the safety risk is eliminated so far as is practicable or minimized so far as is practicable if elimination is not reasonably practicable.
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not	Action is required and effort must be made to ensure that the safety risk is eliminated so far as is practicable or minimized so far as is practicable if elimination is not reasonably practicable.

	high.	
Low	Should be corrected or the risk reduced, if the treatment cost is low.	A level of safety risk that requires monitoring and review to ensure that the safety risk remains at this level.
Insignificant	No action required	Safety risk has been determined to be so low that no further action is required. In this case the consequence is considered to not result in any injury to any person.

14.6 Road Category and Risk Rating



- Category 1 (most urban streets and lower volume rural roads). The characteristics of category 1 roads are defined by the following parameters:
    - Posted speed and AADT of:
        - any speed limit with less than 3,000 vehicles per day AADT
        - a speed limit of less than 60 km/h and traffic volumes between 3,000 and 10,000 vehicles per day AADT
    - The characteristics of these roads are generally recognized as:
        - roads (with or without a centre line), sealed and unsealed
        - two lanes two way, and sections including one-way single lane, and overtaking lanes.

- Category 2 (high-volume roads). The characteristics of category 2 roads are defined by the following parameters:
    - Posted speed and AADT of:
        - a speed limit greater than, or equal to 60 km/h and traffic volume greater than, or equal to 3,000 vehicles per day AADT
        - any speed limit with traffic volumes greater than, or equal to 10,000 vehicles per day AADT.
    - Signalized intersections
    - The characteristics of these roads are recognized as:
        - multi lane or divided roads
        - high speed highways.
    - This Category of road:

- may include major urban streets in the central business district, some arterial roads.
- generally, requires larger signs.
- generally, requires signs on both sides of the road.
- Stringent criteria for mobile operations apply to this Category of TTM.

- Category 3 (expressways = high-volume & high-speed roads). The characteristics of category 3 roads are defined by the following parameters:
  - These are high-volume expressways, or high volume/high-speed multi-lane expressways with a divided carriageway.
  - Any expressway and any associated on-ramp or off- ramps
  - Grade separated road with speed limit greater than, or equal to 90 km/h. Traffic volumes are generally greater than 20,000 VPD but can be lower
  - For this Category, TMA's shall be used when setting up or removing static worksites.

Street	Road Type	Speed	Category
Courtney Drive	Two-Way	50 kph	1
Rangeview Road	Two-Way	50 kph	1
MacKellar Drive	Two-Way	50 kph	1

14.7 Determining the Risk Rating for Planning

Site risk rating						
		Clearance between traffic lane and workers				
		< 1.2 m	1.2 – 3.0 m	3.0 – 6.0 m	6.0 – 9.0 m	> 9.0 m
Posted speed limit and road type	40 km/h					
	Category 1 road	Medium	Low	Low	Low	Low
	Category 2 road	Medium	Low	Low	Low	Low
	50 km/h					
	Category 1 road	Medium	Low	Low	Low	Low
	Category 2 road (urban)	High	Medium	Low	Low	Low
	60 km/h or 70 km/h					
	Category 1 road	High	Medium	Low	Low	Low
	Category 2 road	High	High	Medium	Low	Low
	80 km/h or 90 km/h					
	Category 1 road	High	High	Medium	Low	Low
	Category 2 road	High	High	High	Medium	Low
	Category 3 road	High	High	High	Medium	Low
	100 km/h or higher					
	Category 1 road	High	High	High	Medium	Low
	Category 2 road	High	High	High	Medium	Low
	Category 3 road	High	High	High	Medium	Low

14.8 Risk Assesment

SAFETY HAZARD	RISK	RISK RATING			CONTROL MEASURE	After Control Measure Rating		
		A	B	C		A	B	C
Non Compliant TGS Implementation	-Injury to workers and road users and passengers -Property damage and financial losses	1	Cat	VH	- TGS is developed by a certified TMD - TGS are approved by clients, traffic companies and relevant local authorities. - TMI must be the one to implement the TGS on site. - Any changes on the design TGS/TMP must be reviewed and approved by TMD and relevant road authorities before the implementation.	5	Ins	N
Incorrect TMP	Vehicle Collision Injury to road users, passengers and workers Damage to property Damage to work vehicle Violation to AGTTM Confusion Delays	1	Cat	VH	-Prior to developing TMP, site visits must be conducted by OPT HIRE and or Site Services Traffic Management Professionals to identify potential risk associated with the works. -TMP is developed by a certified TMD - TMP must be checked and approved by client, traffic company and other relevant road authorities - Risk assessment must be conducted prior to development of the TMP	5	Ins	N
Environmental Factors	Move or remove traffic devices and signs Give confusion to road users Poor visibility Road Slippery Collision Injury	1	Cat	VH	- A site risk assessment must be conducted by designated person/party before implementing the TGS - Implementation of TMP must be undertaken by Level 2 qualified personnel - For poor visibility, Class 1 retroreflective signage must be used. - Workers on site wear visibility clothing. - When required, site to be closed or workers to vacate the site until site can be maintained in an acceptable level of safety. - To minimize the dust, regular watering of the site is to be implemented by designated party.	4	Ins	N
Local Access		1	Cat	VH	- Contractor to appoint a person and communicate regularly with the local residents, property/business owners for the arrangement, changes and progress of the works. - Affected locals will be notified through door knock, sending letter through letterbox and community or community briefing. - Traffic control to manage local access, loading and unloading zones. - Work area to be secured and delineated with the 2m lockable temporary fence.	5	Ins	N
Significant Delay/Traffic congestion	Time Loss Accident Damage to properties	1	Cat	VH	- TMP must be design by a certified TMD - TGS Implementation must be in accordance to time approved and stated on the TMP - Site supervisor to monitor traffic volume and ensure to impose changes when to shorten traffic delay.	5	Ins	N
Emergencies	Injury to road users, passengers and or workers Damage to properties Time Loss Traffic Delays	1	Cat	VH	- Incident/accident to be reported to site supervisor and site supervisor to cease all works - All work communications to stop and emergency communications to be uninterrupted - Site Supervisor to report to emergency response team and to relevant road authority - Emergency Services must have full access to site be given full cooperation - Emergency Plan to be implemented as per pre-start meeting.	5	Ins	N
Pedestrian/cyclists Fail to follow signs	Injury to pedestrian or cyclist	1	Cat	VH	- Clear signage and direction of pedestrian (past, through, around) - Containment Fence and delineation to separate pedestrian from the work area - TMD to review and adjust the TGS if required - Enforcement to pedestrian to be considered	5	Ins	N

					- Clear path, safe surface to pass by the pedestrian and cyclist and ramps at changes from path to road are to be provided			
Vehicles fail to follow signs	Injury to workers, road users and passengers Damage to properties Traffic Delays	1	Cat	VH	- TGS and TMP are developed by a certified TMD - TGS and TMP are approved by client, traffic company and relevant local authorities. - TMD to review and adjust TGS if required - TGS to be implemented on site by the TMI - Enforcement to be considered	5	Ins	N
Worker strays onto live roadway or clear zone	Injury to workers, road users and passengers Damage to properties	1	Cat	VH	- Clear signage and delineation - Adequate clearance from work area to travelled path - Adequate procedure and control	5	Ins	N
Site Entry and Exit and site deliveries	Injury to workers, road users and passengers Damage to properties Traffic Delay	1	Cat	VH	- TGS and TMP provides clear instruction on how site access and site deliveries are managed on site - Traffic controllers on site to assist traffic and work vehicles - Workers are fully given with clear instructions	5	Ins	N
Obstacle on worksite	Injury to workers, road users and passengers Damage to properties	1	Cat	VH	- Site supervisor to ensure site is clear and no obstruction on travel path - Materials are to be stored on approved area - Work vehicle to park clear from travelled path - Proper attention is given to traffic - Proper attention is given to pedestrian - Worksite must not be left unattended	5	Ins	N
Increased exposure of pedestrian to traffic and or plant	Injury to workers, road users and passengers Damage to properties	1	Cat	VH	- Clear signage and direction of pedestrian (past, through, around) - Containment Fence and delineation to separate pedestrian from the work area - TMD to review and adjust the TGS if required - Adequate clearance of pedestrian to traffic and plant - Traffic controller to assist pedestrian past or through the site - Consideration to Pedestrian crossing and diversion is to be given attention	5	Ins	N
Traffic exposure to excavation	Injury to workers, road users and passengers	1	Cat	VH	- TGS is to be reviewed and approved by qualified TMD - Increased separation of traffic from excavation - Aftercare arrangements - Increase Protection of road users against the excavation	5	Ins	N
Devices, delineation, signage damaged or moved/removed	Confusion and Delay Injury to workers, road users and passengers Damage to properties	1	Cat	VH	- Implementation of Daily Pre-start site inspection - Signs and devices to be checked every 2 hours - TMD to review and adjust the TGS if required	5	Ins	N
End of Queue Collision	Collision Reduced Visibility	1	Cat	VH	- TGS and TMP are developed by a certified TMD - Traffic controller to monitor queue length - Traffic holding time to be adjusted - TMD to review and adjust TGS if required	5	Ins	N

15 Traffic Assessments

15.1 Road Speed on the vicinity of the worksite

Street	Speed
Courtney Drive	50 kph
Rangeview Road	50 kph
MacKellar Drive	50 kph
Side Street	**Speed**
Gordon Drive	50 kph

15.2 Speed Management Plan

The objective of the Speed Management Plan is to achieve compliance by road users with the roadwork speed limits. It documents all measures to be taken by OPT HIRE to achieve this outcome. Due to the distance and nature of road and works, speed reductions is deemed unnecessary. Speed management plan will not be required.

15.3 Annual Average Daily Traffic (AADT)

Road Name	AADT
Courtney Drive	TBD
Rangeview Road	TBD
MacKellar Drive	TBD

15.4 Heavy Vehicle Route

Courtney Drive, Rangeview Road and MacKellar Drive are not located in an approved heavy vehicle route.

15.5 Public Transport

When closure of public services is required, appropriate authority must be notified and coordinate with the arrangement of public transport during works.

15.5.1 Bus Stop

There are no bus stop within the vicinity of the work, no treatment is required,

15.6 Community Impact

There is no known impact on any community groups or requirements by this project.

15.7 Local Access Treatment

All affected local access will be always maintained. Otherwise, will be managed by traffic controller.

15.8 Affected Schools

It is envisaged that there will be no schools impacted by this project.

15.9 Business Impact

There will be no business impacted by this project.

15.10 Dust and Noise Management

Dust and Noise management are detailed in contractors Environmental Plan.

16 Traffic Management Plan - Works Programming

16.1 Road Closure (Site Access - Haulage Plan)

The D'Aguilar Highway is a state-controlled major road, linking the Bruce Highway near Caboolture with the Bunya Highway in Kingaroy. Majority of the works will be completed under the shoulder closure.

Design Steps		Feature	Reasoning	Option
Traffic Through the Worksite		- Holding traffic for not more than 15 minutes - minimal disruptions to road users -Traffic will not be required to be diverted	- Traffic Lane will not be affected by the works.	NOT PREFERRED
Traffic Past the Worksite	Shoulder Closure	- Works are separated from travelled path - Work vehicle/plant are separated from travelled path - There will be no unnecessary traffic delays	- There is insufficient lane width remained to maintained traffic flow and safely pass by only closing the side road.	**PREFERRED**
	Lateral Shift	- Traffic can naturally flow past the work area - There will be no unnecessary traffic delays	- There is no sufficient lane width remaining to maintain two-way traffic. .	NOT PREFERRED
	Lane Closure (Multilane)	- No diversion of traffic required - Work vehicle/plant are separated from remaining travelled path - Lowers the chance of collision	- Road is not on multilane road.	NOT PREFERRED
	Lane Closure (Shuttle Flow)	- No diversion of traffic required - Work vehicle/plant are separated from remaining travelled path - Lowers chance of collision	- There is sufficient traffic lane width to cater single shuttle lanes with reversible flow facilitated by traffic controller/portable traffic control devices.	NOT PREFERRED
Traffic Around the Site	Detour	- Lowers the chance of collision - Enough room for	- Provides maximum separation of traffic from work area	**PREFERRED**

Design Steps		Feature	Reasoning	Option
		plant/workers/deliveries to occupy traffic lane - Increase separation of work/workers/plants from road users	- Do not require detour and local access will be managed by traffic controller .	
	Side Track	- Lowers the chance of collision - Enough room for plant/workers/deliveries to occupy traffic lane - Increase separation of work/workers/plants from road users	- There is a sufficient lane width remained, sidetrack is unnecessary.	NOT PREFERRED
	Crossover (Contraflo w)	- Lowers the chance of collision - Enough room for plant/workers/deliveries to occupy traffic lane - Increase separation of work/workers/plants from road users	- There is a sufficient lane width remained, contraflow is unnecessary.	NOT PREFERRED
Short Term Low Impact		- Works will not impact traffic flow/emergency vehicle - minimal impact on road users	- Short term low impact road on open roads will be in accordance to AGTTM Part 5	NOT PREFERRED
Mobile Works		- Works will not impact traffic flow/emergency vehicle - minimal impact on road users	- Mobile Works will be in accordance to AGTTM Part 4	NOT PREFERRED

16.1.1 Pedestrian Management Considerations

There are no existing footpath and work area is located where pedestrians are not expected to frequent. Pedestrian will not be affected and no treatment is needed.

16.1.2 Cyclist on Road Consideration

There is no existing bicycle lane on road, cyclist on road will utilize the travelled path and will be guided by sign and devices.

16.1.3 Property/Business Access Considerations

Any property/business access will be maintained throughout the project.

16.1.4 Local Access Considerations

Local access will be always maintained. Otherwise, traffic controller on site to facilitate local acces.

16.1.5 Excavation Treatment

This work involves no excavation. Hence, no treatment is required.

16.1.6 Traffic Guidance Scheme

SS240112011-TGS1-Haulage Plan-Courtney Drive, Upper Coomera-v0

17 Traffic Management

17.1 Site Access (Work Vehicle)

Site vehicles will be entering through the work area side and exit on the termination area utilizing normal gaps in traffic flow.

17.2 Site Staff Access

Site Staff will access the site via existing/temporary footpath.

17.3 Staff Parking

Staff will only park in designated parking areas where vehicles will not obstruct travelled paths.

17.4 Long Term Signage

Long term signage should be mounted on post 2.2 m from the bottom of the sign to the ground and 1 meter away from the travelled path. Long term signage that is unable to be installed in accordance with the above clause, due to site constraints, will be mounted 200mm high from the shoulder surface to the bottom edge of the sign and installed per the signage described on TGS.

17.4.1 Condition of Long-Term Signage

Individual signs and devices should be examined before installation to ensure that they are in good condition and their performance is not impaired. The following checks are required:

- Mechanical condition
  - Items that are bent, broken or have surface damage, should not be used.
- Cleanliness
  - Items shall be free from accumulated dirt, road grime or other contamination.
- Color of fluorescent signs
  - Fluorescent signs whose color has faded to a point where they have lost their daylight impact should be replaced.
- Night-time visibility
  - Signs required to be effective at night shall be checked for retro-reflectivity as soon as possible after installation. Those whose retro-reflectivity is degraded either from long use or surface damage shall be replaced. Night-time effectiveness can best be checked by viewing the signs by vehicle headlights in dark conditions.

17.5 Short Term Signage

Installation of short-term signs to be mounted clearly visible from traffic. The minimum height from the shoulder surface to the bottom edge of the sign is 200mm and mounted to a level ground free from any blockage.

Should generally be located and erected as follows:

- ***In open road areas***
  - On the road shoulder, a minimum of 1 m clear of the travelled path.
- ***In built-up areas***

- Behind the kerb if visible to oncoming traffic and not obstructing pedestrians; otherwise, on the pavement as near as practicable to the kerb without the sign becoming obscured and without obstructing moving traffic.

17.6 Positioning of Devices

Signs and devices should be positioned and erected so that–

- they are properly displayed and securely mounted.
- they are within the line of sight of the intended road user.
- they cannot be obscured from view (for example, by vegetation or parked cars);
- they do not obscure other devices from the line of sight of the intended road user.
- they do not become a possible hazard to workers, pedestrians, or vehicles.
- they do not deflect traffic into an undesirable path.
- They do not restrict sight distance for drivers entering from side roads or streets, or private driveways; and
- they are not installed using supports that could be a hazard if struck by a vehicle.
- Where practicable, signs shall be erected on both sides of the roadway on multilane divided or one-way roads where the volume is 10 000 vpd or greater. This treatment should also be considered for all other roads, especially those with curved alignments.
- Signs should face towards approaching traffic approximately at right angles to the line of sight from the driver to the sign.
- At curved alignments, the sign should be placed approximately at right angles to the line of sight of a motorists 50m in advance of the sign.

17.7 Adjustment to Existing Devices

To avoid confusion, existing signs and traffic control devices which are inappropriate to, or conflict with, the temporary work site situation shall be fully covered or removed.

17.8 Night Conditions

- Signs shall be floodlit if outside the headlight beams. Delineating devices shall comprise or incorporate retro-reflectors. Flashing lamps may be used to draw attention to certain advance signs. Flashing lamps shall not be used for delineation.
- Pavement markings through the work site shall be retro-reflective. This may be achieved by means such as reflectorizing paint using drop-on beads, retro-reflective preformed materials or raised retro-reflective pavement markers.
- Hazards or barriers may require floodlighting to make them more conspicuous. Care should be taken that floodlighting, undimmed illuminated flashing arrow signs, matrix-type variable message signs and other similar devices do not cause disability glare for approaching drivers. Except in an emergency, floodlighting should not be provided by use of vehicle headlights.
- Signs required to be fluorescent by day and retro-reflective at night, for example, the Workers (symbolic) sign, shall have a sign face background comprising combination fluorescent retro-reflective material.

17.9 Cone and Bollards

- Traffic cones shall be 700mm in height and consist of fluorescent red or fluorescent orange material that is resilient to impact.
- Temporary bollards shall comprise a vertical parallel sided or tapered tube of fluorescent orange or red material that is resilient to impact. They shall be at least 750 mm in height and a minimum of 100 mm in diameter. Bollards shall be designed to be stable under reasonably expected wind conditions and air turbulence from passing traffic. They shall

be securely fixed to the pavement or weighted to provide adequate stability from passing traffic when unattended.

- Cones and bollards used under night conditions shall be reflectorized in accordance with QMUTCD Book 3.
- Temporary Hazard markers (T5-5) used in conjunction with bollards
- Traffic cones and bollards shall comply with the requirements of QMUTCD Book 3 and be placed in accordance with the arrangement shown on the Traffic Guidance Scheme
- Unless cones are firmly fixed in position they shall be used only while work is in progress, or in locations where there is an employee in attendance who shall reinstate any of the cones which have been dislodged by traffic. Otherwise, they shall be removed, and bollards or barriers substituted.
- Cones and bollards used under night conditions shall be reflectorized in accordance with QMUTCD Book 3.

17.10 Containment Fence

Containment fences are used to keep road workers or pedestrians within a defined area, safely away
from traffic.

Tapes:

– may be used to contain workers on foot and plant within the work area boundary
– shall not be used as delineation between traffic and containment fence
– shall not be used for pedestrian containment adjacent to traffic
– shall be a minimum 100 mm wide with stripes of alternate, contrasting colour
– shall be installed so that tape is supported 1 m above ground.

Plastic Mesh Fencing:

– may be used for pedestrian containment and/or containing workers on foot and plant within the work area boundary
– shall be installed so that the top of the fence is 1 m above ground.

Longitudinal Channelizing Barricades:

– may be used for pedestrian containment and/or containing workers on foot and plant within the work area boundary
– shall comprise interconnected modules only
– shall be marked with letters stating ‘NOT A SAFETY BARRIER’

17.11 Site Fencing

Prior to implementation of the project, site boundaries are enclosed with construction fencing in accordance to safety requirements of Work Health and Safety Act 2011 and to comply with AS 4687-2007.

17.12 Barriers

Road Safety Barrier Systems (RSBS) including end treatments shall be compliant and installed in accordance with AS/NZ3845, TMR specifications and all manufacturer’s specifications.
The approval of the design and the installation of TRSBS shall be in accordance with AGTTM Part 3. An exclusion zone that incorporates the barrier's dynamic deflection as defined by manufacturers specs and delineated utilizing a suitable and compliant containment fence shall be installed.

17.13 Portable Traffic Signal

Portable Traffic Signal Systems will not be used for this project.

17.14 Queues Delays and Monitoring

Traffic queuing will be monitored at all times to avoid collisions of vehicles and unacceptable delays.
The following are to be considered:

- If possible adjustment of the shuttle operations to reduce the hold time at each end of the active control.
- Additional advance warning and adjustment to existing Prepare to Stop Signs with repeater signs may be necessary
- A queued traffic ahead (T1-Q15) multi-message sign assembly may be used as the primary advance sign.
- A second traffic controller can be employed to shift the PREPARE TO STOP sign and the ROADWORK HEAD sign as necessary to maintain its minimum required distance in advance of the end of queue. The traffic controller may also display the SLOW bat at each location in which case a 60 km/h temporary speed zone shall be extended to cover that position.
- Distant advance warning using variable message signs should also be used where practicable.

17.15 Pedestrian Management

Where pedestrians, including school children and people with disabilities or visual impairment, have to move around, through or past a work site or to cross the road within a work site, they shall be provided with and directed to suitably constructed and protected temporary footpaths and crossing points, or formal pedestrian crossings, or refuges if warranted.
Pedestrian and bicycle paths should, where practicable, be provided on the same scale and to the same width as any facilities for pedestrian or bicycle traffic that were existing prior to the works.

17.16 Trench/Excavation Protection and Delineation

There will be no excavation for this project and no treatment is required.

17.17 Site Equipment

Site equipment used for this project will be stored within the site compound

17.18 Site Delivery

Site deliveries arrangement will be synchronized with the site access arrangement and to be managed by the site supervisor.

18 Notifications

All traffic management notifications must be submitted and authorized to relevant road authorities prior to project implementation. This includes but is not limited to TMR, Local Government, public transport providers and utility providers.

Depending upon the nature of the work and prevailing traffic conditions, affected community stakeholders, private and business access are notified prior to the commencement of the project. Affected body will be given a letter notification and or door knock.

Public Notification include matters of:

- Physical changes to the road
- Expected delays and traffic impacts
- Alternative route and transport mode options

The extent of notification required will be worksite-specific and depend on the scope, scale, impact and duration of the works. General public is to be made aware of the complaints process associated with the TMP.

Council Contact Details:

Gold Coast City Council
Phone: 1300 465 326 (8am to 5pm, Monday to Friday)
Email: mail@goldcoast.qld.gov.au
Post: Chief Executive Officer
City of Gold Coast
PO Box 5042
GOLD COAST MC 9726

18.1 Notification of emergency services

Emergency Services notification for road closures, contraflows, expected traffic delays, traffic control on major roads and works involving speed reduction or lane closures for periods of longer than five days.

Emergency is to be provided with the scope of works, site access arrangements in case of emergency and arrangements made by TMP that may impact on route and travel times of emergency services.

19 Emergency Arrangements and Contingency Planning

19.1 Emergency Services Access

Emergency vehicles are to be given priority through the works site. Site supervisor to ensure there is a clear path for emergency vehicles, if a situation arises on site project manager will inform emergency services. Detours are to be detailed in TGS prior to implementation. The following are to be considered:

- Nature or works.
- Location
- Dates and duration
- Site conditions
- Access details
- Contact details of designated person/organizations

19.2 Emergency Arrangements

Emergency on site to be recorded and identify the following:
- Any dangerous good sites
- Gas and electricity transmission features
- Any other potentially dangerous facilities/situations in the vicinity of the work area.

19.3 Contingency Planning

Contingency Plans		
	Description	Actions
Major Incident	• Fatality or notifiable injury real or potential • Significant property damage, or • Emergency services (police, fire, etc) require access or control of the site.	The TMI must immediately conduct the following: • Stop all activity and traffic movement • Secure the site to prevent (further) injury or damage • Contact the appropriate emergency authorities • Render first aid if competent and able to do • so notify the RIM representative and / or the engineer • Under the guidance of the officer in charge of the site, reduce effects of TTM on the road or remove the activity if safe to do so • Re-establish TTM and traffic movements • when advised by emergency authorities that it is safe to do so • Comply with any obligation to notify WorkSafe.
Incident	• Excessive delays - real or potential • Minor or non-injury accident that has the potential to affect traffic flow structural failure of the road.	• Stop all activity and traffic movement if required • Secure the site to prevent the prospect of injury or further damage • Notify the RIM representative and / or the engineer • TMI to implement a plan to safely remove TTM and to establish normal traffic flow if safe to do so Re-establish TTM and traffic movements when its safe to do so and when traffic volumes have reduced.
Detour	If because of the on-site activity it will not be possible to remove or reduce the effects of TTM once it is established a detour route must be designed. This is likely for: • Excessive delays when using an alternating flow design for TTM • Redirecting one direction of flow and / or • Total road closure and redirection of traffic until such time that traffic volumes reduce, and tailbacks have been cleared. The risks in the type of work being undertaken, the risks inherent in the detour, the probable duration of closure and availability and suitability of detour routes need to be considered. The detour and route must be designed including: • Pre- approval from the RIM whose roads will be used or affected by the detour route. • Ensure that TTM equipment for the detour - signs etc are on site and pre-installed.	When it is necessary to implement the pre-planned detour the TMI must immediately undertake the following: • Notify the RIM and / or the engineer when the detour is to be established • Drive through the detour in both directions to check that it is stable and safe • Remove the detour as soon as it practicable and safe to do so and the traffic volumes have reduced, and tailbacks have cleared • Notify the RIM and / or the engineer when the detour has been disestablished and normal traffic flows have resumed.
Requirements for no interference at an accident scene: In the event of an accident involving serious harm the TMI must ensure that nothing, including TTM equipment, is removed or disturbed and any wreckage article or thing must not be disturbed or interfered with, except to: • Save a life of, prevent harm to or relieve the suffering of any person, or • Make the site safe or to minimize the risk of a further accident, or		

Contingency Plans

• Maintain the access of the general public to an essential service or utility, or
• Prevent serious damage to or serious loss of property, or
• Follow the direction of a constable acting in his or her duties or act with the permission of an inspector

Authorisations						
		Yes	No		Yes	No
Parking restriction(s) alteration authority	Will controlled street parking be affected?			Has approval been granted?		
Parking restriction(s) alteration authority	Will portable traffic signals be used, or permanent traffic signals be changed?			Has approval been granted?		
Road closure authorisation(s)	Will full carriageway closure continue for more than 5 minutes (or other RIM stipulated time)?			Has approval been granted?		
Bus stop relocation(s) – closure(s)	Will bus stop(s) be obstructed by the activity?			Has approval been granted?		
Authorisation to use portable traffic signals	Make, model and description/number			Has approval been granted?		
	Product compliant?					

Design Exception (DE)			
Is an DE applicable?	Yes No *(delete either Yes or No)*	DE attached?	Yes

Delay calculations/trial plan to determine potential extent of delays

Public notification plan

Public notification plan attached?	Yes No *(delete either Yes or No)*
On-site monitoring plan	
Attended *(day and/or night)*	
Unattended *(day and/or night)*	

Method for recording daily site TTM activity

Site safety measures
Other information

Site specific layout diagrams	
Number	**Title**

Contact details					
	Name	**24/7 Contact Number**	**ID**	**Qualification**	**Expiry Date**
Principal					
TMD					
Engineers' Representative					
Contractor					
TMI					
TC					
Others as required					

TMP Preparation						
Preparation						
	Name (TMD qualified)	Date	Signature	ID no.	Qualification	Expiry Date
This TMP meets AGTTM requirements Number of diagrams attached						

TMP returned for correction *(if required)*						
	Name	Date	Signature	ID no.	Qualification	Expiry Date
TMD to complete following section when approval or acceptance required						
Approved by TMD (delete one)						
	Name	Date	Signature	ID no.	Qualification	Expiry Date
Acceptance by TMD						
	Name	Date	Signature	ID no.	Qualification	Expiry Date

Qualifier for engineer or TMI approval

Approval of this TMP authorises the use of any regulatory signs included in the TMP or attached traffic management diagrams. This TMP is approved on the following basis:

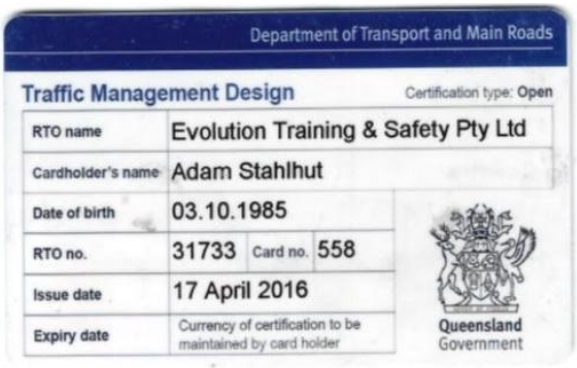
1. To the best of the approving TMD's judgment this TMP conforms to the requirements of AGTTM.
2. This plan is approved on the basis that the activity, the location and the road environment have been correctly represented by the applicant. Any inaccuracy in the portrayal of this information is the responsibility of the applicant.
3. The TMP provides so far as is reasonably practicable, a safe and fit for purpose TTM system.
4. The TMI for the activity is reminded that it is the TMI's duty to postpone, cancel or modify operations due to the adverse traffic, weather or other conditions that affect the safety of this site.

Notification to TMI prior to occupying worksite/Notification completed				
Type of notification to TMI required		**Notification completed**	Date	
			Time	

Appendix A: Traffic Guidance Scheme List

TGS	Times	Duration
SS240112011-TGS1-Haulage Plan-Courtney Drive, Upper Coomera-v0	TBD	TBD

APPENDIX C: Traffic Officer Evidence



Department of Transport and Main Roads

Traffic Management Design Certification type: **Open**

RTO name	Evolution Training & Safety Pty Ltd
Cardholder's name	Adam Stahlhut
Date of birth	03.10.1985
RTO no.	31733 Card no. 558
Issue date	17 April 2016
Expiry date	Currency of certification to be maintained by card holder

Queensland Government



Department of Transport and Main Roads

The cardholder has met the requirements of the Traffic Management Design Program.

Cardholder's signature

APPENDIX B: TRAFFIC GUIDANCE SCHEME