CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN – CEMP

Ivanhoe Estate
Stage 1B Civil Works
Epping & Lyonpark Roads
Macquarie Park
NSW 2113

SSD 8903 Condition B40	Construction Environmental Management Plan	This Document to Total
SSD 8903 Condition B39, B41 & B62	Traffic Management Plan	Appendix 4 within this document
SSD 8903 Condition B42	Noise & Vibration Monitoring Plan	Appendix 8 within this document
SSD 8903 Condition B43	Air Quality & Odour Management Plan	Appendix 9 within this document
SSD 8903 Condition B44	Waste Management Plan	Appendix 10 within this document
SSD 8903 Condition B45	Soil & Water Management Plan	Appendix 5 within this document
SSD 8903 Condition B64 & B65	Asbestos Management Plan	Appendix 12 within this document
SSD 8903 Condition B98	Shrimpton Ck Work Methodology within the Creek	Appendix 1 within this document

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Note:

- *All issues and revisions of this Template are reviewed and approved by the Systems Manager and Director/s*
- *This is a Christie Civil office server-controlled document - printed copies of this document are uncontrolled*

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CONTENTS

1.0 Introduction ***4***

1.1 Background to the Project 4

1.2 Purpose and Scope 5

1.3 Environmental Legislation, Regulations & Guidelines 6

1.4 Site Planning 6

1.5 Implementation and Operation 7

1.6 Checking and Corrective Action 11

1.7 Review 13

2.0 Description of Site and Works ***14***

2.1 Summary of Major Environmental Issues 14

These issues are to be conveyed to all site personnel in their initial Site Induction 14

2.2 Site Contact List 14

APPENDIX 1 ..... ***16***

Shrimptons Creek Work Methodology: Falsework Foundation ***39***

APPENDIX 2 ..... ***39***

Site EnvornmentalAspects, Impacts & Safeguards ***16***

APPENDIX 3 ..... ***40***

Weekly Assesment Checklist ***39***

APPENDIX 4 ..... ***40***

Traffic Management Plan ***40***

APPENDIX 5 ..... ***41***

Construction Soil & water Management Plan ***41***

APPENDIX 7 ..... ***42***

Site Layout Plan ***42***

APPENDIX 8 ..... ***45***

Construction Noise and Vibration Management Plan ***44***

APPENDIX 9 ..... ***46***

Air quality and odour management plan ***45***

APPENDIX 10 ..... ***47***

Waste management plan ***46***

APPENDIX 11 ..... ***48***

Biodiversity management plan ***47***

APPENDIX 12 ..... ***48***

Asbestos Management plan ***49***

1.0 Introduction

1.1 Background to the Project

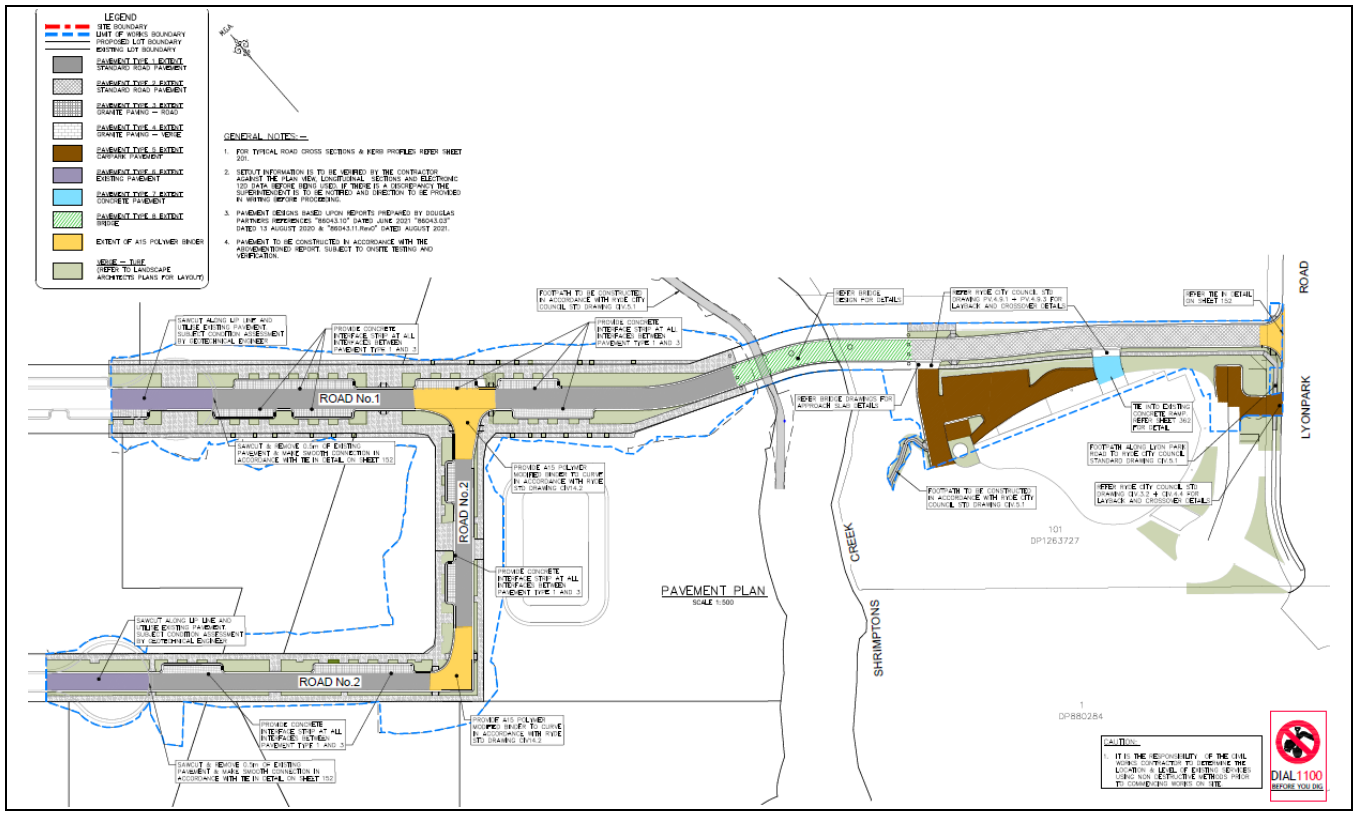
Frasers Properties have awarded Christie Civil Pty Ltd the Contract for the construction of Stage 1B Civil and bridge works to the Ivanhoe Estates project at Macquarie Park. The concept of stage 1B is to construct an access road from stage 1B through to Lyonpark Road. The works involve construction of a curved post tensioned bridge, road and drainage works, access and carpark work to an existing operation building.

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). The site is approximately 8.2 hectares and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. An aerial photo of the site is provided at Figure 1 below. Immediately to the north of the site are a series of four storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot that is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment. Epping Road runs along the south-western boundary of the site and Shrimptons Creek, an area of public open space, runs along the south-eastern boundary. Vehicle access to the site is via Herring Road and Lyonpark Road. Ivanhoe The Masterplan site incorporates adjoining land, being a portion of Shrimptons Creek and part of the commercial site at 2-4 Lyon park Road. This land is included to facilitate a bridge crossing and road connection to Lyon park Road.

The works area is effectively bounded by Herring / Epping and Lyonpark Roads in Macquarie Park, Sydney.

Activities include:

- Dilapidation report
- Site clearing
- New driveway entrance to LIF building carpark
- Temporary access over Shrimptons creek
- 10 Bored piles
- Form, reo pour abutments, retaining walls, bridge piers
- Falsework to bridge deck
- Form, reo, pour bridge deck
- Post tensioning of bridge deck
- Steel handrails and bike guides
- Street and bridge lighting
- Gabion cladding
- Road construction including
    - Excavation
    - Place basecourse
    - Kerb and gutter
    - Ashpalt
    - Linemarking
- Relocation of electrical kiosk
- Electrical works
- Services works
- Stormwater works including GPT
- Paving
- Landscaping



1.2 Purpose and Scope

In accordance with Project Consolidated Consent Mod 3 SSDA 8903, Condition B40, the Contract requires the Contractor to implement an CEMP for this project. It is to address all safeguards included in the Review of Environmental Factors and Consent SSDA 8903, as directed by the NSW Government. This project is considered State significant. It is also to demonstrate that compliance with all the obligations of relevant Acts, Statutes, Legislation, Ordinances, Regulations, By Laws and any other such legal requirements that are applicable to the Contract are met. The Contractor will demonstrate that "due diligence" is performed for the duration of the Contract in accordance with the NSW *Protection of the Environment Operations Act, 1997*, in preventing the pollution of the environment or the unlawful disposal of waste.

The CEMP is subject to audit – that is, it is used to assess conformance with environmental aspects, impacts and controls on the site.

The CEMP for the construction phases of the works has been prepared in accordance with the Conditions of Approval, all relevant statutory Acts and Regulations, and any applicable Current Practices and standards endorsed by the NSW Government and Ryde Council. The CEMP shall be reviewed and endorsed by the Manager, Statutory Planning before construction commences.

Christie Civil will ensure that the mitigation measures identified in the environmental impact assessment documentation and the Conditions of Approval are incorporated and detailed in this CEMP. The CEMP will

(a) Identify the construction activities associated with the work, including construction sites and the staging and timing of the works
(b) Identify statutory obligations which Christie Civil is required to fulfil during construction, including all approvals and licences
(c) Include a communication strategy and complaints management procedure
(d) Identify the environmental management structure indicating the responsibility, authority and accountability for personnel relevant to the CEMP

(e) Provide details of construction personnel induction and training program. This will include incorporation of the CEMP into agreements with suppliers and subcontractors
(f) Outline emergency procedures and list contact details
(g) Provide details of measures to avoid and control environmental impacts as outlined in the environmental impacts assessment documentation.

1.3 Environmental Legislation, Regulations & Guidelines

1.3.1 Relevant NSW legislation

Refer to *SSPF21 - Project Legal Register* and *SOPF3.02.6 - Site Environmental Aspects, Impacts & Safeguards*

1.3.2 Approvals Required

Prior to commencement of any works including clearing works on site, approval to proceed shall be issued by Frasers Property.

In accordance with Development Consent SSDA 8903 Condition B64 & B65, it should be noted that Environmental Earth Sciences have provided a clearance certificate for the Ivanhoe Estate Site. However, in the event that asbestos is found on site, it will be treated as an unexpected find as documented in our Asbestos Management plan.

All main/subcontractors must comply with:

- B64 - All notification requirements regarding the handling and removal of any asbestos to SafeWork NSW listed in Section 1.5.5.
- B65 – Prior commencement of any work, you satisfy the requirements of the Protection of the Environment Operations (Waste) Regulation 2013 with reference to Part 7 – transportation and management referred to in our Site Environmental aspects, impacts and safeguard document.

1.4 Site Planning

1.4.1 Environmental Issues, Controls, Objectives, Targets and Program

A series of tables contained in Appendix 1, establishes the environmental issues for this site over which Christie Civil can exercise control or influence. The tabulated format lists in summary the environmental issues for the site, control strategies to minimise impacts, defines objectives and targets, management programs, monitoring and reporting requirements. These tables form the basis of the CEMP for the project, enabling the Christie Civil to achieve environmental performance.

The cross matrix identifying compliance with the consolidated consent is also found in appendix A

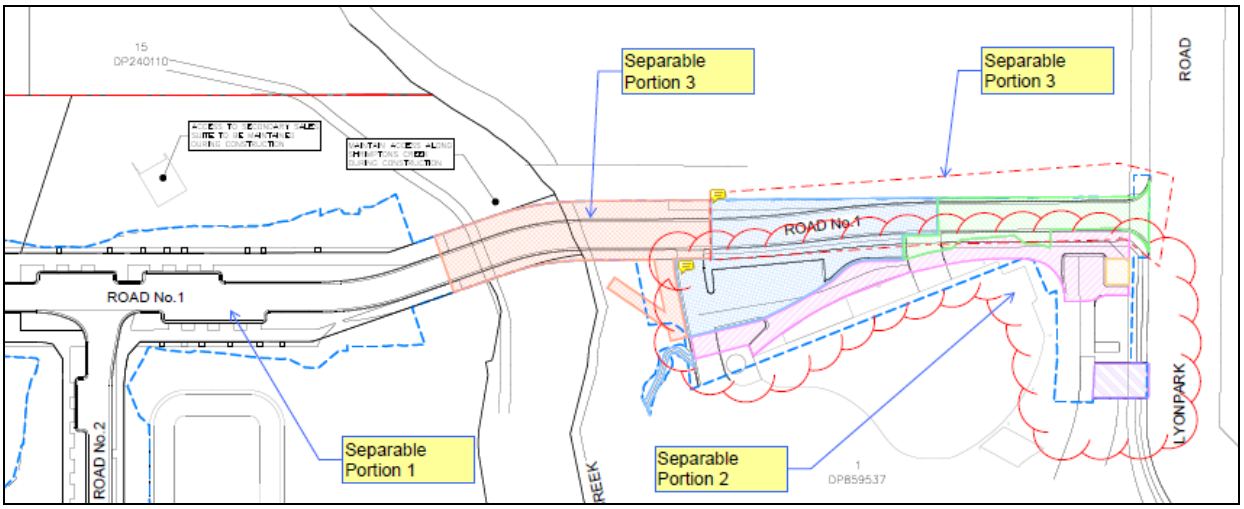
The layout of the sites is contained in Appendix 5 - Site Layout Plan

The construction of Stage 1B is broken up into 3 separable portions:

- Separable portion 1 – Roadworks from Road 1 to bridge
- Separable portion 2 – New access for LIF and part roadworks to LIF building

- Separable portion 3 – Bridge and roadworks from bridge to Lyonpark Road.

Separable portions 2 and 3 will be constructed in 5 phases as detailed below.
As an overview, below is a drawing showing the separable portions. Separable portion 1 will be accessed by the Herring Road entrance which is a shared entrance managed by others . Separable portion 2 and 3 will be accesses via Lyonpark Road. It is noted that the bridge will require some access via the Herring Road entrance. A temporary access will be constructed across the existing Shrimptons creek to allow for access on either side of the bridge for pedestrians and light vehicle.



Generally, the bridge is on critical path and its duration is approximately 10 months. Other works are not on critical path but will be started near the commencement of the project. It is noted that there are some long lead time items that will be procured at the start of the project.

For detailed durations, please refer to the Construction programme in Integrated Project Management plan Appendix E

Pre compliance reporting.

If requested by Frasers Properties, and documentation require for Pre-Construction Compliance Report shall be prepared and submitted as requested.

1.5 Implementation and Operation

1.5.1 Training, Awareness and Competence

All workers will be suitably trained in the environment, will be aware of their responsibilities and competent to carry out the work.

The environmental requirements will be explained to employees during the site induction and ongoing training via Toolbox Talks.

All workers will receive induction/training in the following:

- The purpose of the CEMP
- Individual responsibilities
- The Significant Environmental issues to consider
- Potential consequences of departure from procedures
- Communication pathways for Environment related issues
- Emergency procedures and response

- Legal obligations

All training and Toolbox Talks shall be recorded and filed in the Environment Management File.

1.5.2 Communication and Reporting

Internal communication methods include the following, as applicable:

- Site meetings
- Project reports
- Audit reports
- Non-conformance reports
- Employee induction, training and Toolbox Talks (as required)

External communications methods include:

- Community consultation
- Discussions with adjoining landowners, neighbours who may be affected by the project
- Handling of complaints

1.5.3 Emergency Preparedness and Response

Environmental emergencies shall be handled in accordance with the Emergency Response Procedure as part of the Safety Management Plan. The Client and relevant statutory and regulatory authorities shall be informed of major non-conforming environmental incidents or pollution events.

Environmental incidents shall be handled as follows:

- Immediately report all incidents to the compliance@planning.nsw.gov.au after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one), and set out the location and nature of the incident. Representative or their Delegate
- Immediately take all reasonable steps to contain further damage or danger to personnel and the environment
- Contact Emergency Services as necessary (e.g. ambulance, fire department, spill clean-up services, etc)
- Complete a detailed report of the incident and submit to the client within 5 days
- Initiate corrective and preventive action
- Records of Environmental Incidents to be maintained in *Incident Register*

Information on the handling of hazardous materials is contained in the SDS file.

Emergency Services contact numbers are displayed in the main Site Office.

1.5.4 Roles, Responsibilities and Accountabilities

The main groups responsible for the day-to-day environmental management on site are the Christie Civil Site Team, including the Project Manager, Site Supervisor (Foreman), Site Engineers and Leading Hands. Their roles, responsibilities and accountabilities are outlined below.

As this project has multiple sites, the responsible person from the Christie Civil management team on any day may be any of the above personnel. Any person adopting the supervisory role, short or long term is to be fully inducted into this CEMP.

Role

The role manages contractors and construction on a daily basis to ensure the time, quality, financial, community and environmental targets of site are met.

Responsibilities

- Report directly to the Project Manager and inform the Project Manager on all environmental and community matters;
- Ultimately responsible to ensure that the EMP is implemented on-site;
- Ensure that all on-site personnel have undertaken the environmental Site Induction training prior to the commencement of works;
- Ensure that all Subcontractors comply with environmental protection programs appropriate to their activities;
- Ensure that all Subcontractors comply with community relations protocols and procedures;
- Ensure compliance with any resident agreements and commitments;
- Conduct regular site inspections, at least weekly and following rain events, of the site, surrounding areas and contractor activities;
- Record and action System Defects (i.e. spills, incidents and complaints) when required; and
- Liaise directly with planning sectretary Representatives to ensure full compliance with EMP.

Accountability
The Site Supervisor is accountable to the Project Manager for all site issues.

In addition to Christie Civil's site responsibilities, the relevant NSW Government regulatory authority and Client roles and responsibilities are as follows:

- To review and approve the Contractor's Environmental Management Plan
- Monitor site performance
- Order Stop Work Notices in the event of non-compliances

Environmental Benefits of Complying with EMP Procedures

The Site Induction process is designed to improve site personnel awareness of the impact of construction works on the local community and environment and what they can do to minimise these impacts. The benefit of site personnel adhering to the EMP requirements is that construction works will have minimal impact on the local community and the environment. The site environment may actually be enhanced through restoration works.

This is also a legal requirement. Issues raised in the REF have been approved under the EPA Act and as such must be adhered to.

Potential Consequences of Departure from Specified EMP Procedures

The benefit of site personnel adhering to EMP requirements is that construction works will have minimal impact on the environment. Consequences of departure from specified operating procedures could have the potential to impact on the Project in the following ways:

- ❑ Detrimental impacts on the environment
- ❑ Liability under environment protection legislation
- ❑ Personal fines and imprisonment
- ❑ Loss of company reputation

1.5.5. Notification requirements to SafeWork NSW concerning handling and removal of asbestos

Notifications of asbestos and demolition work provides risk-based information to SafeWork NSW so it can apply resources and target compliance and enforcement actions to areas of greatest risk to health and safety.

All main/subcontractors must:

- Notify SafeWork NSW **five calendar days** before undertaking any licenced asbestos removal work
- Notify Interstate asbestos removalists to notify SafeWork NSW when carrying out asbestos in NSW.

- Ensure that all asbestos removalised licenced in NSW and interstate asbestos removalists have lodged the notification electronically using SafeWork NSW asbestos and demolition online notification system for new user refer to the Asbestos and Demolition ons user creation procedure.
- Contact SafeWork NSW on 13 10 50 if asbestos needs to be **removed immediately** and lodge a notification electronically using SafeWork NSW asbestos and demolition online notification system within 24 hours of the telephone notification.

  OR

  - Submit the notification form to adu@safework.nsw.gov.au or post to Asbestos and Demolition Unit, SafeWork NSW, PO BOX 1291, Liverpool NSW 1871

Asbestos fines

Inspectors from SafeWork NSW can issue on the spot fines to any individual or business that appoints an unlicensed asbestos removalist, and the licensed asbestos removalists who fail to notify SafeWork of licensed asbestos removal work.

Asbestos fibres more than 0.02 fibres/ml

- For Class A work, the licensed asbestos removalist must order removal work to stop and notify SafeWork NSW immediately if respirable asbestos fibre levels exceed 0.02 fibres/ml in the removal area.

Type of Licence	**What asbestos can be removed?**
Class A	- Any amount of friable asbestos or asbestos containing material (ACM) - Any amount of asbestos contaminated dust or debris (ACD) - Any amount of non-friable asbestos or ACM

Emergency demolition of a structure or plant involving asbestos

All main/subcontractors must notify SafeWork NSW of the demolition or refurbishment of a structure or plant:

- That was constructed or installed before 31 December 2003
- Is located in either a workplace or residential premises where an emergency has occurred
- The structure or plant must be demolished
- Asbestos is fixed or installed in the structure or plant before the emergency has occurred.
- If on residential premises, only the person with management or control of the workplace can notify SafeWork NSW using the SafeWork NSW asbestos and demolition online notification system **or** Emergency demolition notification form.

An emergency occurs if:

- A structure or plant is structurally unsound
- Collapse of the structure or plant is imminent

Hotline and other information

The asbestos and demolition hotline number is 1800 672 718

More information about asbestos notifications is available in from the Asbestos guide or by calling 13 10 50.

Compliance reporting

At the request of Frasers Property, all documentation required for Construction Compliance Reports shall be submitted as requested. Documentation may include:

(a) a results summary and analysis of environmental monitoring;
(b) the number of any complaints received, including a summary of main areas of complaint, action taken, response given and proposed strategies for reducing the recurrence of such complaints;
(c) details of any review of the Construction Environmental Management Plan (CEMP) and the Environmental Management Strategy and associated sub-plans as a result of construction carried out during the reporting period;
(d) a register of any modifications undertaken and their status;
(e) results of any independent environmental audits and details of any actions taken in response to the recommendations of an audit;
(f) a summary of all incidents notified in accordance with this consent; and
(g) any other matter relating to compliance with the terms of this consent or requested by the Planning Secretary

1.6 Checking and Corrective Action

1.6.1 Monitoring and Management

Key characteristics - as outlined in Appendix 1 - of the project operations and activities that have a significant impact on the environment shall be regularly monitored and measured. This shall include:

- recording of information to track performance
- monitoring operational controls
- level of conformance with objectives and targets

Monitoring and measuring equipment shall be calibrated, maintained and controlled in accordance with the equipment specifications. Compliance with relevant Environmental Legislation, Regulations and other controls shall be periodically evaluated during Audits, Site Inspections and Management Reviews of the system.

See Appendix 2 for a copy of environmental checklists for the project.

1.6.2 Non-conformance, corrective action and preventative action

All non-conformances identified, other than environmental incident/pollution events, are to be documented, investigated and addressed in accordance with the system procedure. All environmental incidents/pollution events shall be managed in the following ways:

_ Reported (using an Incident Report and NCR Report)
_ Logged into an NCR Register
_ Investigated and actioned to correct the problem and prevent a recurrence

Incidents require notification to NSW Government Representative

Environmental incidents/pollution events shall be classified as either ***major*** or ***minor*** as follows:

Major *Nonconformance (any one of the points listed)*

- Significant adverse affect on health and safety of personnel
- Breaches of approval licenses, government regulations, policies, etc with risk of penalties, fines or notices being issued

- Effects may be irreversible or costly to fix
- Significant level of valid public or client complaints
- Public image of the Contractor or Client adversely affected
- Rare, endangered or protected species destroyed

Mino*r Nonconformance*

- Effects are easily reversible
- Health and safety of personnel not placed at significant risk.
- Minor irritation or nuisance
- Public image of Contractor or Client unaffected

Minor environmental incidents/pollution events are normally handled by the Site Foreman who is responsible for that section of work and are to be reported to the Project Environmental Representative or his/her nominee on site.

Major environmental incidents/pollution events must be referred to the senior manager on site who shall advise the Project Manager and take appropriate action.

The Client and regulatory authorities should be advised as soon as practicable. The Planning Secretary will be notified when a pollution incident occurs or threatens material harm to the environment.

If a person is injured as a result of an environmental incident, then the incident must be handled jointly in accordance with this plan and the Project Safety Plan.

Corrective and preventative action shall be taken to avoid recurrence of an environmental incident/pollution event or potential environmental incident/pollution events.

1.6.3 Complaints

Complaints or adverse reports received by the Project Office from any external source shall be deemed to be Public Complaints. The Site Foreman and Project Manager shall be notified of all public complaints. All public complaints received (either written or verbal) must be documented to contain the following information:

- The nature and extent of the complaint
- The method by which the complaint was made
- The name and address of the person lodging the complaint
- Details of location, dates, times and effects of the complaint
- The action taken to address the complaint including follow up contact with the complainant

When verbal complaints are received, they shall be documented by company personnel who shall ensure the complaint has been correctly recorded. All public complaints shall be recorded using the *Complaint Report* and entered onto a *Contact and Complaints Register*, or the Client's system. From here the issue raised is recorded as a Non-conformance in an NCR Report.

The Project Manager, or his nominee, shall investigate and determine appropriate corrective/preventive actions to be taken to address all Public Complaints. The complainant shall be informed in writing the results of the investigation and action to be taken by the contractor to rectify or address the matter(s). Where no action is taken the reason/s why are to be recorded. The Register of Public Complaints shall be maintained by the Project Environmental Representative or such other person as nominated by the Project Manager. Records of Public Complaints shall be filed in the Environmental Management File and shall be kept for at least four years after the complaint was made. The complaints telephone number will be published locally in the press or by other suitable means so that the impacted community knows how to make a complaint. Ensure Fraser Properties are notified immediately, followed up by written report within 5 days.

1.6.4 Records

Environmental records shall be:

- kept as objective evidence of compliance with environmental requirements
- filed in accordance with the Environmental Management Filing System
- Video record and photographic record of site activities
- Prior to, during and on completion of works, a photographic record of the current condition will be undertaken in accordance with current heritage

1.6.5 Audits

Christie Civil will conduct weekly inspection checklists of the implementation of the CEMP. (Refer appendix A)

Internal audits will be conducted monthly on each site. The lead auditor will be the company Environmental representative.

To comply with the Project Consent items A20,B5,B6,B7,B8 and B9, auditing of the project may also be carried out by the Client who shall decide on the frequency, scope and timing of project/site audits. The scope is to include all Subcontractor activities. An Audit Report shall be issued to the Contractor.

1.7 Review

The Plan shall be reviewed as and when required during the course of the Contract when the following situations arise:

- Client recommendations for changes, particularly following initial review
- Opportunities for improvement or deficiencies in the project system are identified.

To comply with Consent items A26, A27 and A28, at Frasers Property request, Chritie Civil P/L will provide documentation as requested.

2.0 Description of Site and Works

2.1 Summary of Major Environmental Issues

Table 2.1: Major Environmental Issues

Aspect	Issue/Impact
Drainage and Run Off	Soil erosion and sedimentation making its way into waterways
Flora and Fauna	Unauthorised destruction of fauna and flora
Heritage	Destruction of important or protected heritage items
Traffic and Access	Control and safety or pedestrian, workers and motorists
Air Quality	Air pollution
Worker and Public Safety	Potential accidents to public and workers
Noise	Noise pollution
Waste Disposal	Poor management of waste

These issues are to be conveyed to all site personnel in their initial Site Induction

2.2 Site Contact List

Role	Name	Office No.	Mobile
Contractor Contact Numbers:			
Project Manager	Travis McCleary	02 9552 3077	0402 286 402
Environmental Representative	Tbc		
Site Engineer	Liam Bell		0401 464 166
Site Foreman	Tristan Bruno		0405 771 132
Superintendent Contact Numbers:			
Senior Project Manager – Infrastructure	Stephen Peters	(02) 9767 2000	0438 138 974
Emergency Services:			
HAZMAT		000	
Police		000	
Ambulance		000	
EPA – Pollution Line		131 155	
Poisons Information Centre		131 126	
SCA Emergency No.	Operator	1800 061 069	

APPENDIX 1
SHRIMPTONS CREEK – WORK METHODOLOGY;
Falsework Foundation

WORK METHODOLOGY #1

IVANHOE ESTATE STAGE 1B CIVIL WORKS

SHRIMPTONS CREEK FALSEWORK FOUNDATION

Work Methodology Template - Document Control + Change History

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Note:

- *All issues and revisions of this Template are reviewed and approved by the Systems Manager and Director/s*
- *This is a Christie Civil office server-controlled document - printed copies of this document are uncontrolled*

Work Methodology - Document Control and Change History

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Document Name	**Work Methodology – Shrimptons Creek Bridge Falsework Foundation**

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Revision	Date	Description of Revision	Approved by
A	**14/3/22**	Initial Issue	**Martin Carey**
B	**15/3/22**	Additional information issued to designers	**Colin Cartwright**
C	**24/3/22**	Adjustments to document titles for inspection and test plans and hold points, sketch 1 and sketch 2 revised.	**Martin Carey**

Contents

1 INTRODUCTION 4

2 DURATIONS, PROGRAM AND SEQUENCING 6

3 SUBCONTRACTORS AND CHRISTIE CIVIL RESOURCES 7

4 METHODOLOGY 8

5 SAFE WORK METHOD STATEMENTS 12

6 INSPECTION AND TEST PLANS AND HOLD POINTS 13

7 SITE LAYOUT 14

8 SKETCHES 15

1 INTRODUCTION

Shrimptons Creek Bridge forms part of the contract scope for the Stage1B Civil Works at the Ivanhoe Estate, Macquarie Park. The bridge is approximately 14m wide and 55m long, spanning Shrimptons Creek and its adjoining riparian zone. The bridge comprises a single pour deck, post tensioned, supported on abutments at both ends, and tapered column structures towards the centre of span.

Figure 1: Shrimptons Creek at location of proposed crossing

The bridge deck construction requires the installation of a falsework support system that will allow the deck to be constructed in one continuous pour. The falsework system will also include pathways along either side of bridge to allow safe access and installation of formwork, reinforcing, concrete, post tensioning, barriers etc. Advice from our Formwork Contractor is that foundation for falsework requires a minimum bearing capacity of 150kpa. It must also be capable of withstanding flood events and not exacerbate flood levels upstream. The falsework support must also be constructed in accordance with the CEMP, and ensure the environmental requirements are met.

The overall concept for support system is to provide twin 900mm pipes placed in creek bed conforming to existing levels and alignment. The pipes will be contained in geofabric to control bed and bank erosion, and backfilled with large rock to facilitate low flows. The creek crossing area will have a heavy duty reinforced concrete slab cast over the top. It will form a secure foundation for the fixing of falsework, and allow high stream flows to pass over without affecting upstream flood levels. The areas under bridge on creek banks will be shaped and compacted to achieve required levels and bearing capacity, and capped with a concrete blinding area, The concrete blinding will allow ease of construction, and augment erosion and sediment control.

Independent certification is required for the following:

- Evidence that foundation structure does not adversely impact upstream flood levels
- Certification of adequacy of foundation
- Certification of adequacy of falsework
- On completion of all works the falsework and foundation is to be removed and riparian zone constructed to its design configuration.

2 DURATIONS, PROGRAM AND SEQUENCING

The current program shows bridge works commencing in April 2022, and finishing in October 2022. The falsework support system will be in place for the majority of this 6 month period.

The sequence of all works in the falsework support area is as follows:

- Installation of initial environmental controls and tree protection zones as per CEMP.
- Clearing and grubbing of all vegetation
- Installation of temporary security fencing around works area.
- Installation of geofabric, twin 900 pipes and rockfill to creek
- Removal of metal GPT from existing headwall and place twin 600mm pipes and backfill with sand/cement.
- Installation of additional environmental controls to suit reconfigured site as per CEMP.
- Excavate under bridge to suit piling platforms and abutment construction
- Construct all piling and pile cap works
- Once piling and pile cap works complete, retrim and recompact to 150kpa underbridge area.
- Construct reinforced concrete slab over creek crossing and concrete blinding to remainder of under bridge area.
- Ensure all concrete slabs and blinding are graded to facilitate stream flows and eliminate ponding that will affect construction.
- Construction of falsework, and bridge structure
- On completion of bridge structure, remove all falsework and support structure and reconstruct creek and riparian zone.

3 SUBCONTRACTORS AND CHRISTIE CIVIL RESOURCES

The majority of the falsework support structure will be constructed by Christie Civil resources. Subcontractors will be used for specific activities. Due to the critical nature of these works, a full-time supervisor and site engineer will be allocated to this activity, reporting directly to the Project Manager.

The following activities and equipment will be conducted directly by Christie Civil:

- Installation of environmental controls and tree protection zones
- Installation of pipes and materials in existing creek bed and headwall, using 15t to 20t excavator
- Excavation and filling for piling platforms, using 15t to 20t excavators, trucks and rollers
- Excavation, retrimming and compaction for concrete slabs and blinding, using excavators, bobcats and rollers
- Removal of all falsework support structure, using 3t to 5t excavators, bobcats and trucks

The following activities will be conducted by Subcontractors:

- Clearing and grubbing
- Placement of concrete slab and blinding
- Piling
- Installation and removal of falsework

Independent Certification will require, Geotechnical Engineer, Structural Engineer and Civil Engineer.

4 METHODOLOGY

The methodology follows the sequencing and resourcing as outlined above. Detailed methodology for each activity as follows.

Initial environmental controls and tree protection zones.

DBYD and service search conducted to ensure works do not impact on existing services.

Labour force, trained in manual handling, will install sediment controls along creek bank and other sensitive areas. Temporary fence panels will be installed around tree protection zones, and secured. All vegetation to be removed is clearly marked and identified.

Clearing and grubbing

Traffic and pedestrian controls in place to manage users of LIF building and pedestrians accessing pathways.

Licenced and insured tree clearing contractor carefully removes trees to avoid damage to adjacent trees and structures and impacting the creek.

Stumps and roots removed by 15t to 20t excavator

Vegetation is transported to Herring Rd side of site, and placed through tub grinder and reduced to mulch. This is stockpiled on site for future use.

Once clearing and grubbing complete, environmental controls reinstated and site security fence installed.

Creek Pipe Installation

Recent extreme weather events allowed us to review stream flows in detail. We have undertaken a cross section survey of creek and monitored stream flows under various rain events. Normal dry weather flows have an approximate flow rate of a maximum of .5m3/second. Stream level do not exceed RL 41.5. During prolonged heavy rain as experienced late February, early March flow rates of up to 5m3 per second with a stream level approaching RL 41.7 were recorded. The extreme weather event of February 23rd, where approximately 100mm of rain fell in 1 hour, stream rose to RL 42.5. Based on this observed information, our creek crossing is based on a finish RL of 42.5. This will allow all dry weather flows and normal rain events to flow under and through creek crossing. Only extreme rain events will overtop structure. To avoid upstream flooding the overall creek and bank zone cross sectional area is only slightly reduced as bank on abutment B is substantially lowered. This greatly compensates the filling of the creek.

Figure 2: Debris and Obstructions in Creek Channel

The twin 900mm pipes will be placed in existing creek bed. Prior to pipe installation, debris and obstructions will be removed from the creek channel, mainly in front of existing headwall structure. To eliminate disturbance of sediments and downstream turbidity, a layer of geofabric will be laid in creek bed, a layer of 50mm sandstone bedding placed to correct creek invert irregularities, and pipes laid directly on top. Due to the uneven and irregular alignment of creek, pipe joints may not align, therefore an additional layer of geofabric will be wrapped around pipes to avoid material washing through joints. The entire creek zone will be then backfilled with sandstone boulders. This will create an additional path for low flows, and avoid the use of granular backfill that may create downstream sedimentation. Compaction of this zone will via “mechanical interlocking”, using a heavy excavator and vibrating roller to create a solid platform.

Headwall Pipe Installation

The falsework system will need to span over the existing headwall and 1200mm pipe. The existing metal GPT screen will be removed, and a steel frame structure placed on headwall apron. This steel frame will be aligned so it does not impede flows, and will be designed by structural consultant to ensure it can support the falsework and bridge deck construction. To compensate for the removal of the existing GPT screen, a sheet of mesh will be placed at end of headwall to capture any debris discharging from 1200mm pipe.

Figure 3: Existing 1200mm Headwall

Reinforced Concrete Slab Creek Crossing

Our structural engineer will design a reinforced concrete slab to be cast over creek crossing. Its design will ensure it is stable in flood conditions and can support the weight of falseworks and bridge construction process.

Its construction will be a conventional form / reo / pour of a structural slab to Engineers design. It will be graded to facilitate over topping flows.

Blinding Slab

All earthworks under proposed blinding slab to be excavated, trimmed and compacted to required bearing capacity. Once tested and certified, a protective blinding layer will be placed over this area. It will provide a solid work platform and mitigate any environmental issues due to sealing of subgrade below.

Falsework Support

The falsework system will be as per the Formwork Contractors certified design. The design will include fixing details to concrete surfaces to ensure stability in flood events, provision for jacking to ensure levels conform to design, and capacity to carry the live weight of bridge construction process.

To mitigate flood impacts concrete barriers may be required to break flow forces in proximity of vertical scaffold, and debris screens placed along upstream approach.

Removal of Falsework Support

Once bridge constructed, there will be limited head height for construction equipment. It is planned to use smaller excavators 3t to 5t to break up and remove concrete slabs and blinding. Larger excavators

working from sides will remove larger pipes and rock fill. Once removed, creek and riparian construction as per contract will be undertaken.

5 SAFE WORK METHOD STATEMENTS

These will consist of the following and be finalised once site established and worker consultation undertaken.

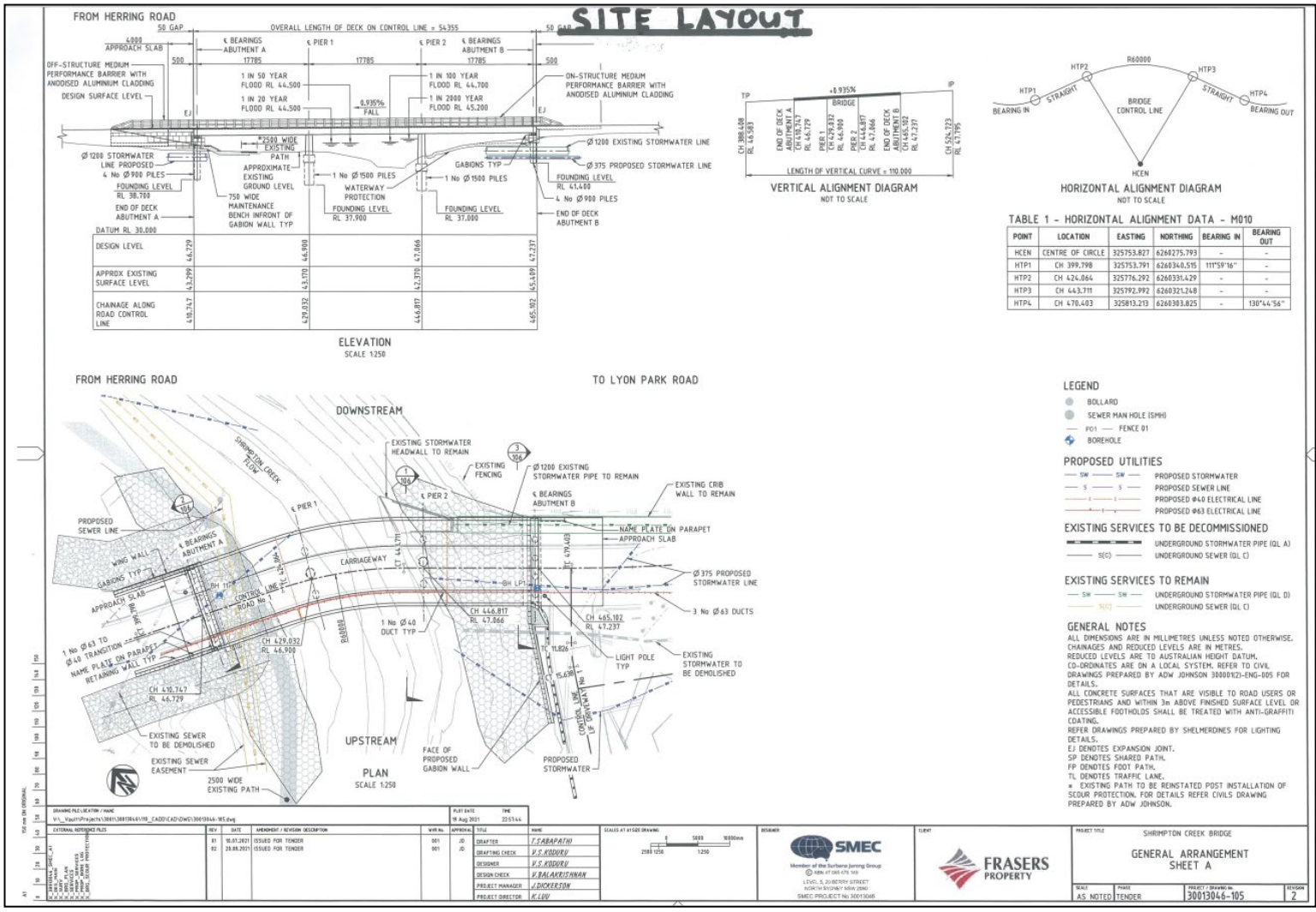
- Site establishment including environmental controls and site fencing
- Clearing and grubbing
- Pipe laying
- Earthworks including excavation and filling
- General concrete construction
- Piling
- Falsework Installation

6 INSPECTION AND TEST PLANS AND HOLD POINTS

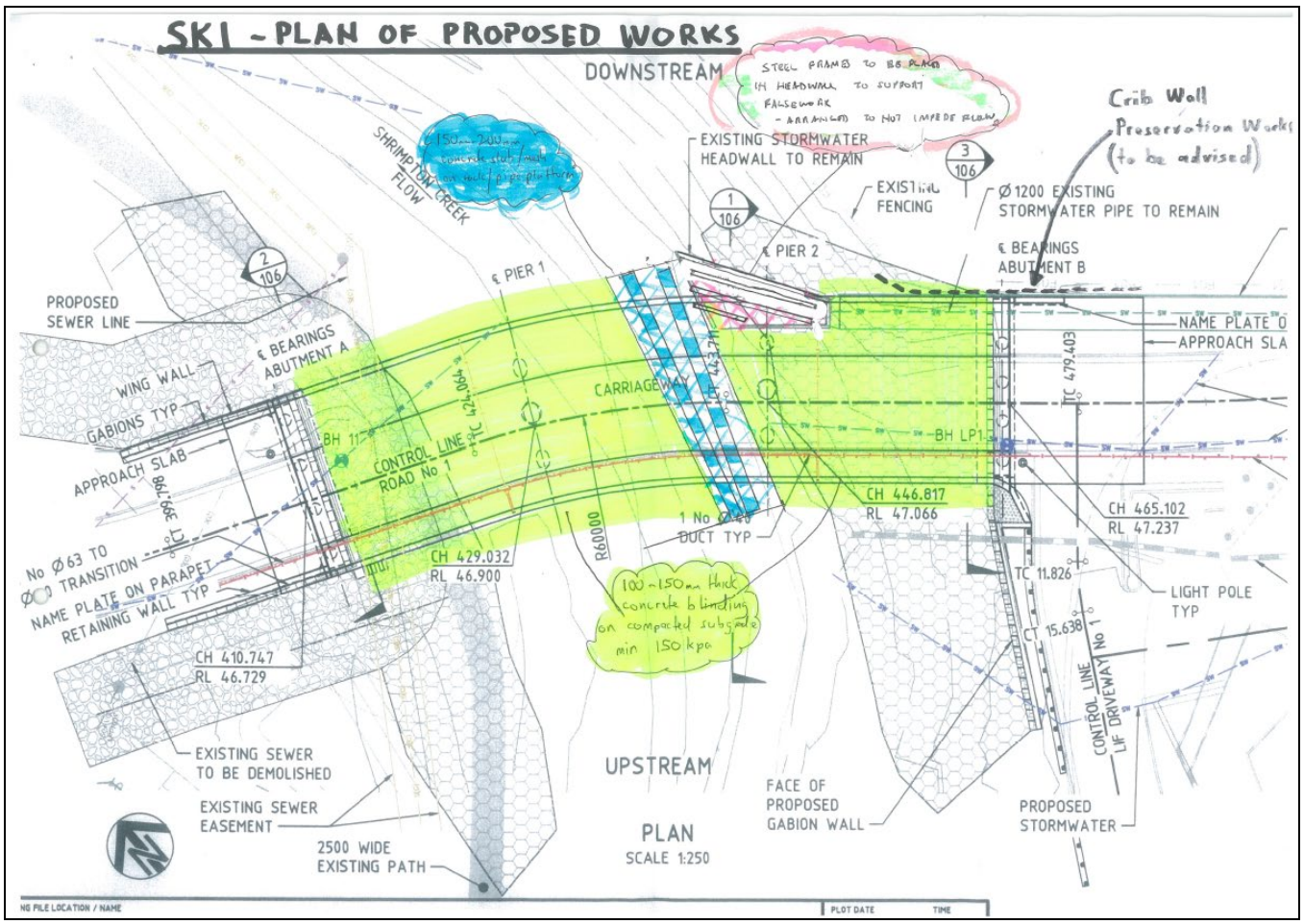
These will be further developed once site established and will consist of the following:

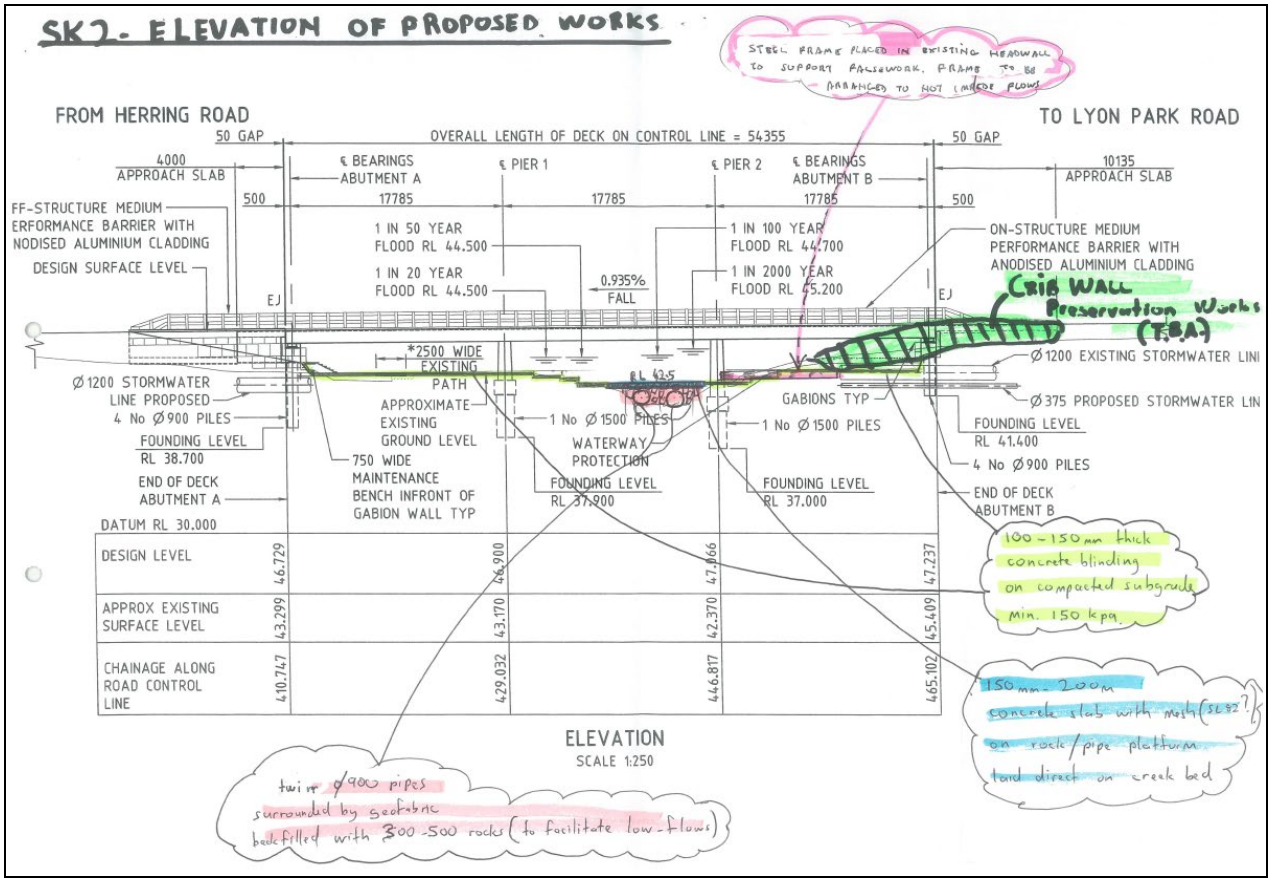
- SSPF3 – Daily Site Checklist
- SOPF3.02.8 – Safety + Environmental Inspection Checklist (Weekly)
- ITP – Pipe Laying
- ITP – Earthworks
- ITP – Concrete Structures
- ITP – Piling
- ITP – Falsework

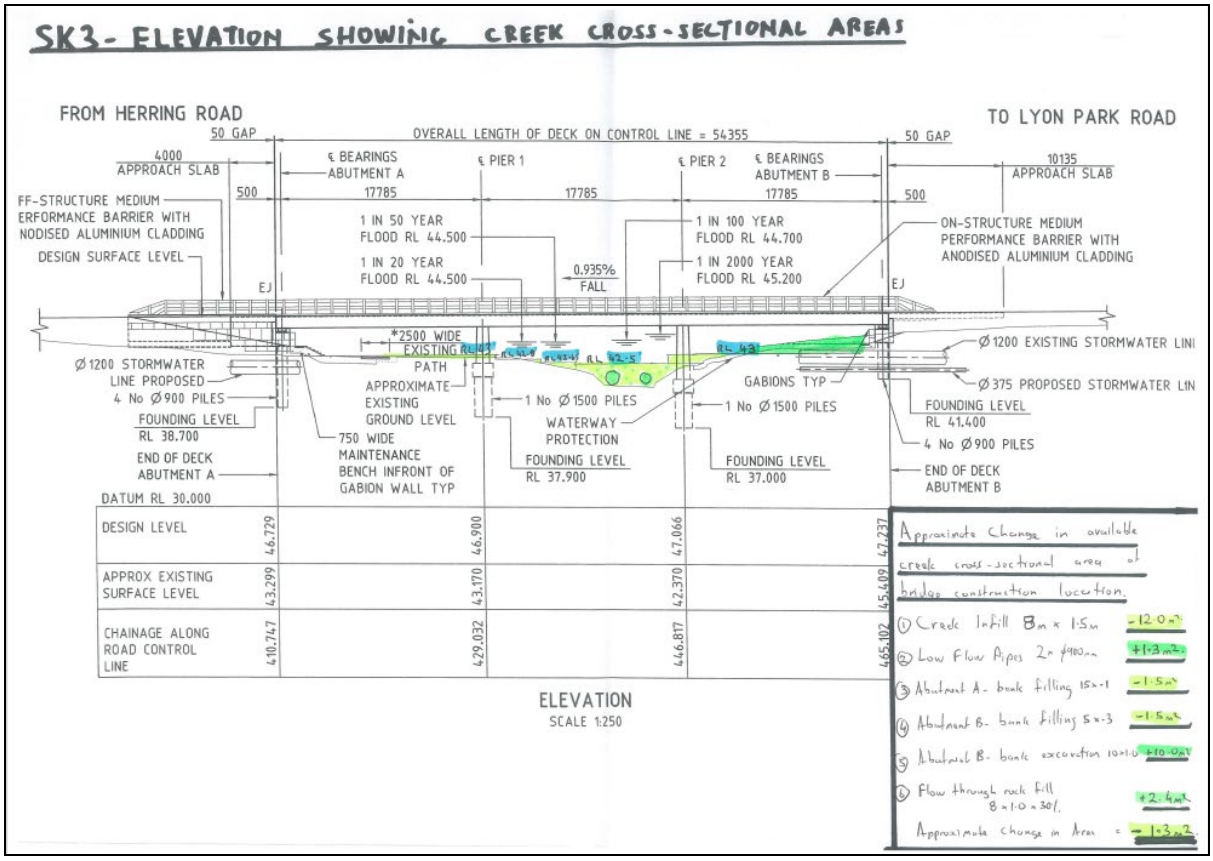
7 SITE LAYOUT



8 SKETCHES


SK1 - PLAN OF PROPOSED WORKS
DOWNSTREAM
STEEL FRAMES TO BE PLACED IN HEADWALL TO SUPPORT FALSEWORK - ARRANGED TO NOT IMPEDE FLOW
Crib Wall Preservation Works (to be advised)
EXISTING STORMWATER HEADWALL TO REMAIN
EXISTING FENCING
Ø1200 EXISTING STORMWATER PIPE TO REMAIN
SHRIMPTON CREEK FLOW
PROPOSED SEWER LINE
WING WALL
GABIONS TYP
APPROACH SLAB
℄ BEARINGS ABUTMENT A
℄ PIER 1
℄ PIER 2
℄ BEARINGS ABUTMENT B
CONTROL LINE ROAD No 1
CARRIAGEWAY
BH 11
BH LP1
No Ø63 TO Ø90 TRANSITION
NAME PLATE ON PARAPET
RETAINING WALL TYP
CH 429.032
RL 46.900
CH 446.817
RL 47.066
CH 465.102
RL 47.237
1 No Ø150 DUCT TYP
R60000
100-150mm thick concrete blinding on compacted subgrade min 150kpa
TC 11.826
LIGHT POLE TYP
CH 410.747
RL 46.729
EXISTING SEWER TO BE DEMOLISHED
EXISTING SEWER EASEMENT
2500 WIDE EXISTING PATH
UPSTREAM
PLAN
SCALE 1:250
FACE OF PROPOSED GABION WALL
PROPOSED STORMWATER
CONTROL LINE DRIVEWAY No 1
NAME PLATE
APPROACH SLA
NG FILE LOCATION / NAME
PLOT DATE
TIME


SK2- ELEVATION OF PROPOSED WORKS
STEEL FRAME PLACED IN EXISTING HEADWALL TO SUPPORT FALSEWORK. FRAME TO BE PARALLELED TO NOT LIMIT FLOWS
FROM HERRING ROAD
TO LYON PARK ROAD
50 GAP
OVERALL LENGTH OF DECK ON CONTROL LINE = 54355
50 GAP
4000 APPROACH SLAB
℄ BEARINGS ABUTMENT A
℄ PIER 1
℄ PIER 2
℄ BEARINGS ABUTMENT B
10135 APPROACH SLAB
500
17785
17785
17785
500
FF-STRUCTURE MEDIUM ERFORMANCE BARRIER WITH NODISED ALUMINIUM CLADDING
DESIGN SURFACE LEVEL
1 IN 50 YEAR FLOOD RL 44.500
1 IN 20 YEAR FLOOD RL 44.500
0.935% FALL
1 IN 100 YEAR FLOOD RL 44.700
1 IN 2000 YEAR FLOOD RL 45.200
ON-STRUCTURE MEDIUM PERFORMANCE BARRIER WITH ANODISED ALUMINIUM CLADDING
EJ
EJ
CRIB WALL Preservation Works (TBA)
*2500 WIDE EXISTING PATH
Ø1200 EXISTING STORMWATER LIN
Ø1200 STORMWATER LINE PROPOSED
4 No Ø900 PILES
FOUNDING LEVEL RL 38.700
APPROXIMATE EXISTING GROUND LEVEL
750 WIDE MAINTENANCE BENCH INFRONT OF GABION WALL TYP
1 No Ø1500 PILES
WATERWAY PROTECTION
FOUNDING LEVEL RL 37.900
GABIONS TYP
1 No Ø1500 PILES
FOUNDING LEVEL RL 37.000
Ø375 PROPOSED STORMWATER LIN
FOUNDING LEVEL RL 41.400
4 No Ø900 PILES
END OF DECK ABUTMENT A
END OF DECK ABUTMENT B
DATUM RL 30.000
DESIGN LEVEL 46.729 46.900 47.066 47.237
APPROX EXISTING SURFACE LEVEL 43.299 43.170 42.370 45.409
CHAINAGE ALONG ROAD CONTROL LINE 410.747 429.032 446.817 465.102
100 - 150 mm thick concrete blinding on compacted subgrade min. 150 kpa
150 mm - 200m concrete slab with mesh (SL82?) on rock/pipe platform. land direct on creek bed
ELEVATION
SCALE 1:250
twin Ø900 pipes surrounded by geofabric backfilled with 300-500 rocks (to facilitate low-flows)


SK3- ELEVATION SHOWING CREEK CROSS-SECTIONAL AREAS
FROM HERRING ROAD
TO LYON PARK ROAD
50 GAP
OVERALL LENGTH OF DECK ON CONTROL LINE = 54355
50 GAP
4000 APPROACH SLAB
℄ BEARINGS ABUTMENT A
℄ PIER 1
℄ PIER 2
℄ BEARINGS ABUTMENT B
10135 APPROACH SLAB
500
17785
17785
17785
500
FF-STRUCTURE MEDIUM ERFORMANCE BARRIER WITH NODISED ALUMINIUM CLADDING
DESIGN SURFACE LEVEL
1 IN 50 YEAR FLOOD RL 44.500
1 IN 20 YEAR FLOOD RL 44.500
0.935% FALL
1 IN 100 YEAR FLOOD RL 44.700
1 IN 2000 YEAR FLOOD RL 45.200
ON-STRUCTURE MEDIUM PERFORMANCE BARRIER WITH ANODISED ALUMINIUM CLADDING
EJ
EJ
*2500 WIDE EXISTING PATH
Ø 1200 EXISTING STORMWATER LINE
Ø 1200 STORMWATER LINE PROPOSED
4 No Ø 900 PILES
FOUNDING LEVEL RL 38.700
END OF DECK ABUTMENT A
APPROXIMATE EXISTING GROUND LEVEL
750 WIDE MAINTENANCE BENCH INFRONT OF GABION WALL TYP
1 No Ø 1500 PILES
WATERWAY PROTECTION
FOUNDING LEVEL RL 37.900
GABIONS TYP
1 No Ø 1500 PILES
FOUNDING LEVEL RL 37.000
Ø 375 PROPOSED STORMWATER LIN
FOUNDING LEVEL RL 41.400
4 No Ø 900 PILES
END OF DECK ABUTMENT B
DATUM RL 30.000
DESIGN LEVEL 46.729 46.900 47.066 47.237
APPROX EXISTING SURFACE LEVEL 43.299 43.170 42.370 45.409
CHAINAGE ALONG ROAD CONTROL LINE 410.747 429.032 446.817 465.102
ELEVATION
SCALE 1:250
Approximate change in available creek cross-sectional area of bridge construction location.
① Creek Infill 8m x 1.5m -12.0m²
② Low Flow Pipes 2 x ϕ900mm +1.3m²
③ Abutment A - bank filling 15x-1 -1.5m²
④ Abutment B - bank filling 5x-3 -1.5m²
⑤ Abutment B - bank excavation 10x1.0 +10.0m²
⑥ Flow through rock fill 8 x 1.0 x 30% +2.4m²
Approximate change in Area = -1.3m²

CHRISTIE CIVIL

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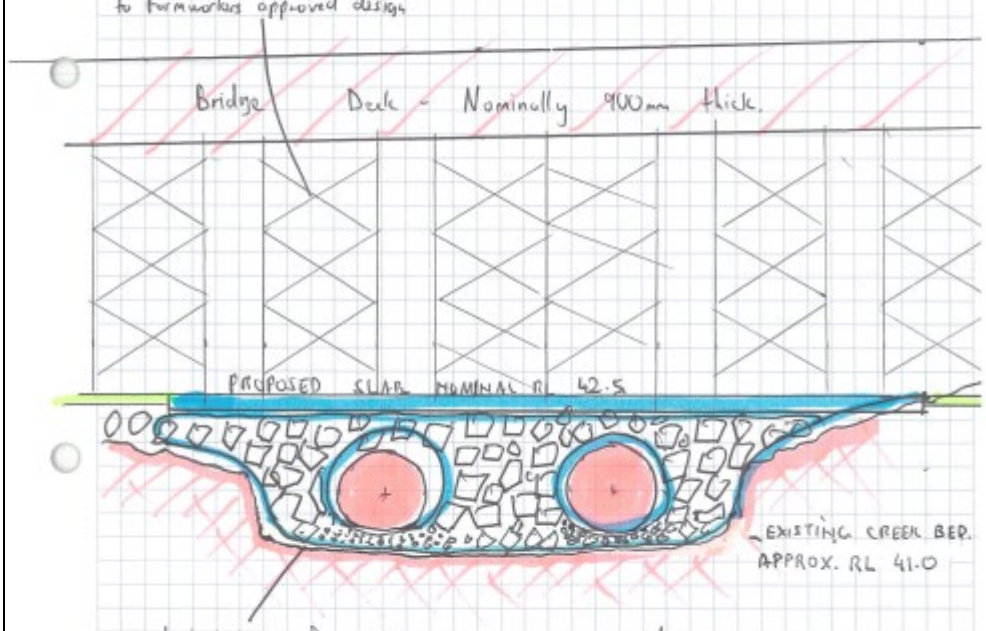
SHRIMPTONS CREEK BRIDGE METHODOLOGY

Date: 14/3/2022
Page: 1/1.

SK 4 TYPICAL SECTION OF CREEK CROSSING.
DETAILING CONSTRUCTION



① Initial layer of geofabric placed on creek bed.
② twin ϕ900 pipes laid to match creek bed/alignment on 50-75mm sandstone bedding
③ additional geofabric wrapped around pipe.
④ creek backfilled with 300mm to 500mm sandstone rocks to RL 42.2
⑤ Concrete Slab (reinforced) placed to RL 42.5, graded at .5% downstream

APPENDIX 2
SITE ENVIRONMENTAL ASPECTS, IMPACTS AND SAFEGUARDS

SITE ENVIRONMENTAL ASPECTS, IMPACTS & SAFEGUARDS

Project: Project Name
Issue No: 0
Date Prepared:

	Aspect (Add Additional Aspects)	Impacts	Risk *	Applicable Legislation / Regulation	Control Measure	Residual Risk*	Responsibility	Monitoring Requirements
1	Unauthorised removal of trees and any work to neighbouring properties.	Possible unauthorised clearing, damage to environment, Fines	9	D.C SSD 8903 A6 B47	• Include in induction that No works, including tree removal, are approved to 6-8 Lyonpark Road, Macquarie Park (Lot 62 DP570271). This is the property to the North of LIF. Ensure (a) no street trees on public land are trimmed or removed unless it forms a part of this development consent or is required in an emergency to avoid the loss of life or damage to property; (b) all trees that are not approved for removal are to be suitably protected by way of tree guards, barriers or other measures to protect the root systems, trunk and branches during construction, in accordance with AS 4970:2009; and (c) any removal works are to be undertaken by a qualified arborist recognised within the Australian Qualification Framework, with a minimum five years of continual experience within the industry of operational amenity arboriculture and covered by appropriate and current types	3	FM	Daily visual monitoring.

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					of insurance to undertake such works and in accordance with AS 4373:2007. Biodiversity Plan – see below			
2	Reporting damage to adjacent property	To confirm condition of surrounding areas prior to works to assess any possible damage caused by the works and to prevent false claims of damage.	4	B25	Engage a suitably qualified structural engineer to prepare a Pre-Construction Dilapidation Report, detailing the current structural condition of all existing adjoining buildings, infrastructure and roads within the 'zone of influence'. The report shall be submitted to the Certifier and Council, prior to issue of the relevant Crown Building Works Certificate for Building A1, or any works commencing, whichever is earlier. The dilapidation report is to include a preconstruction assessment of the electrical kiosk.	2	PE	Prior to commence ment and at completion
3	Dust and air quality	Possible air pollution	10	B40 c B43 Protection of Environment Operations Act 1997 (POEO Act)	Dust Management Plan, incorporating the mitigation measures outlined in the Air Quality Assessment, prepared by WSP, dated October 2018 Adequate measures shall be taken to prevent dust from affecting the amenity of the neighbourhood during construction. In particular, the following measures should be adopted: a) physical barriers shall be erected at right angles to the prevailing wind direction or shall be placed around or over dust sources to prevent wind or	4	PE / FM	Daily monitoring

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					activity from generating dust emissions; b) earthworks and scheduling activities shall be managed to coincide with the next stage of development to minimise the amount of time the site is left cut or exposed; c) all materials shall be stored or stockpiled at suitable locations and stockpiles shall be maintained at manageable sizes which allow them to be covered, if necessary, to control emissions of dust and/or VOCs/odour; d) the surface should be dampened slightly to prevent dust from becoming airborne but should not be wet to the extent that run-off occurs; e) all vehicles carrying spoil or rubble to or from the site shall at all times be covered to prevent the escape of dust or other material; f) gates shall be closed between vehicle movements and shall be fitted with shade cloth; and g) cleaning of footpaths and roadways shall be carried out regularly Prior to the commencement of any works, an **Air Quality and Odour Management Plan** (**AQOMP**) must be prepared and submitted to the Certifier. The **AQOMP** must recommend measures to minimise and manage any odours arising from excavation, stockpiling and removal of contaminated soils including, but not			

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					limited to: (a) staged excavation to limit the surface area of exposed odorous material; (b) application of odour suppressants; (c) effective covering of stockpiles and truckloads of excavation spoil; and (d) expedited removal of odorous material from the development to a facility legally able to accept those wastes. The **AQOMP** must include proactive and reactive management strategies, key performance indicators, monitoring measures, record keeping, response mechanisms, contingency and compliance reporting measures. Ensure that stockpiles are small in size and can be easily managed in high winds or other dust generating weathers. Where a stockpile is to exist permanently without addition or removal of material for a period of longer than 2 months, the stockpile must be seeded or covered in geotextile material. When dust is coming from a stockpile it shall be covered, kept wet, or otherwise prevented from creating further dust If weeds are present and are to be removed during construction works			

***Refer Risk Matrix for Risk Rating**

					they will be disposed in consultation with the client and not mulched for reuse in follow up revegetation programs. On completion of all works, repair any damage to grassed areas by seeding, turfing and revegetation to return to original state.			
4	Soil and water management	Uncontrolled sedimentation and water into waterways.	15	B45 Protection of Environment Operations Act 1997 (POEO Act) – Section 5.6 Land Pollution & Waste; Division 2: s142A, s148 Protection of Environment Operations Act 1997 (POEO Act) – Section 5.3 Water Pollution: s120, s148	• A Construction Soil and Water Management Plan (CSWMP) must be prepared to manage soil and water impacts during construction of the development. The CSWMP must be prepared in consultation with Council and a copy provided to Council, prior to the issue of a Crown Building Works Certificate for each building. Any temporary bunding and water diversions should be designed by an appropriately qualified Civil Engineer (registered on the NER of Engineers Australia), or equivalent. The bunding and diversions shall be monitored, especially at the onset of a storm event and measures put in place to remove or modify the structures (without compromising work health and safety standards) so that adjoining properties are not exposed to any greater flood impact. Groundwater quality testing of samples taken from outside the footprint of the	6	PE / FM	Before and after rail events

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					proposed construction, with the intent of ensuring that as far as possible the natural and contaminant hydrochemistry of the potential dewatered groundwater is understood, shall be conducted on a suitable number of samples and tested at a certified laboratory. Water quality targets in accordance with Council's DCP 2014 Part 8.2 and all relevant guidelines must be maintained throughout all construction phases. Testing shall be carried out at a frequency of no less than every three (3) months and inspections and certification shall be undertaken by a suitably qualified Chartered Civil Engineer (registered on the NER of Engineers Australia), or equivalent. Certifications demonstrating compliance shall be submitted to the Certifier.			
5	Pedestrian traffic control	Impact on pedestrians and traffic	15	B41	Prior to the commencement of any works, a **Construction Pedestrian and Traffic Management Plan** (CPTMP) prepared by a suitably qualified person shall be endorsed by TfNSW (Sydney Coordination Office) and submitted to the Certifier. The CPTMP must be prepared in consultation with Council, TfNSW (Sydney Coordination Office), and TfNSW (RMS). The CPTMP shall address (but not be limited to):	5	PE / FM	Daily

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					a) location of the proposed work zone; b) haulage routes; c) construction vehicle access and traffic control arrangements; d) proposed construction hours; • e) estimated number of construction vehicle movements; f) any changes required to on-street parking; g) construction program; h) any potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction; i) cumulative construction impacts of projects considering any traffic and pedestrian management plans prepare for these projects to ensure that work activities are coordinated and managed to minimise impacts on the road network. Information relating to cumulative construction impacts to be sourced from TfNSW (Sydney Coordination Office); j) measures to ensure construction vehicles do not arrive at the site or surrounding areas outside approved hours; k) measures proposed to mitigate any associated general traffic, public			

***Refer Risk Matrix for Risk Rating**

					transport, pedestrian access and cyclist impacts/conflicts; l) measures to encourage public transport use and other non-car travel options by construction workers. Prior to the commencement of works, a copy of the CPTMP demonstrating compliance with the above must be submitted to TfNSW and the Planning Secretary. Unless otherwise authorised, the public way must not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances. Non-compliance with this requirement will result in the issue of a notice by the Planning Secretary to stop all work on site Any damage to the public way, including trees, footpaths, kerbs, gutters, road carriageway and the like, must immediately be made safe and functional by the Applicant.			
6	Noise and vibration	Noise pollution and damage to neighbouring properties due to vibration	15	B42 C7	The development must be constructed with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009). All feasible and reasonable noise and vibration mitigation measures shall be implemented and any activities that could exceed the construction noise or vibration	5	PE / FM	Daily monitoring

***Refer Risk Matrix for Risk Rating**

					management levels shall be identified and managed in accordance with the CEMP and CNVMP. If the noise from a construction activity is substantially tonal or impulsive in nature (as described in Chapter 4 of the NSW Industrial Noise Policy), 5 dB(A) must be added to the measured construction noise level when comparing the measured noise with the construction noise management levels The Applicant must schedule intra-day 'respite periods' for construction activities predicted to result in noise levels in excess of the "highly noise affected" levels, including the addition of 5 dB to the predicted levels for those activities identified in the Interim Construction Noise Guideline as being particularly annoying to noise sensitive receivers. Wherever practical, and where sensitive receivers may be affected, piling activities are completed using bored piles. If driven piles are required, they must only be installed where outlined in the CEMP. Vibration caused by construction at any residence or structure outside the subject site must be limited to: or structural damage vibration to buildings (excluding heritage buildings), British Standard BS 7385 Part 2- 1993 Evaluation and Measurement for Vibration in			

					Buildings; for structural damage vibration to heritage buildings, German Standard DIN 4150 Part 3 Structural Vibration in Buildings Effects on Structure; for human exposure to vibration, the evaluation criteria presented in British Standard BS 6472- Guide to Evaluate Human Exposure to Vibration in Buildings (1Hz to 80 Hz) for low probability of adverse comment; and these limits apply unless otherwise outlined in the CEMP.			
7	Waste management	Waste pollution	15	B44 Environment Operations Act 1997 (POEO Act) – Section 5.6 Land Pollution & Waste; Division 3: s143, s144 Section 5.6A Littering: S144, s145 Waste Avoidance & Resource Recovery Act 2001 Protection of Environment Operations Act 1997	Prior to the commencement of any works and prior to the issue of any Crown Building Works for each building, the Applicant must prepare a **Construction Waste Management Plan** (**CWMP**) in consultation with Council. A copy of the plan must be provided to the Certifier. The **CWMP** must include, but is not limited to, the following information: • (a) the estimated volume or weight of materials that will be reused, recycled or removed from the site; (b) on-site material storage areas during construction; (c) materials and methods used during construction to minimise waste; (d) provide details demonstrating compliance with the relevant	5	PE / FM	Daily

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				(POEO Act) – Section 5.6 Land Pollution & Waste; Division 3: s143, s144 & Section 5.2 Tier 1 Offences: s115 Act 1997 (POEO Act) – Section 5.2 Tier 1 Offences: s116	legislation, particularly with regard to the removal of asbestos and hazardous waste, the method of containment and control of emission of fibres to the air; (e) nomination of the end location of all waste and recycling generated from a facility authorised to accept the material type for processing or disposal; and (f) identification within the **CWMP** of the responsibility for the transferral of waste and recycling bins within the property to the collection point. All requirements of the approved **CWMPs** must be implemented during the excavation and construction of the development.			
8	Biodiversity	Unorthorised removal of vegetation. Disturbance or fauna, revegetation	15	B47 B89 Native Vegetation Act 2003	Prior to the commencement of the relevant works, the Applicant must prepare a **Biodiversity Management Plan** (BMP) for the site. The BMP must be consistent with the recommendations contained in the Biodiversity Assessment Report prepared by Eco Logical, dated October 2019, and be prepared by an appropriately qualified person, in consultation with Council, the EESG and the Natural Resources Access Regulator (NRAR). The BMP must include: a) pre-clearance surveys and	5		

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					clearance supervision of hollow bearing trees b) the replacement of all removed hollows with artificial nest boxes or the removed hollows at a ratio of 1:4 (removed/replaced), with installation occurring within the retained vegetation adjacent to Shrimptons Creek c) a **Vegetation Management Plan** for the long-term management of all vegetation on the site, including Shrimptons Creek and the Epping Road ecological corridor d) the use of local provenance species appropriate for the threatened ecological communities and plant community types present on the site e) appropriate monitoring and maintenance periods of the vegetation to ensure its long-term viability following the completion of the rehabilitation works for **ten (10) years.** f) a Weed Management Plan. A copy of the final **BMP** demonstrating compliance with the above must be submitted to and approved by the Planning Secretary and an approved copy provided to the Certifier.			
9	Hazardous materials / asbestos	Managing asbestos	15	B64/B65	The Applicant shall comply with any notification requirements to SafeWork NSW concerning the handling and	4	FM	Daily

***Refer Risk Matrix for Risk Rating**

					removal of any asbestos Prior to the commencement of any work, the Applicant is required to satisfy the requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 'asbestos wastes'.			
10	Protection of Councils stormwater infrastructure			B99/100	An electronic closed-circuit television report (track mounted CCTV camera footage) prepared by an accredited operator that assesses the condition of the existing drainage line adjacent to the site, including Herring Road and Lyonpark Road immediately adjacent to the site, is required. This report shall include the date of CCTV inspection and shall be submitted to Council's City Works Directorate prior to commencement of any works. The Applicant shall contact Council's Stormwater and Catchments section to obtain a map of Council's existing Stormwater network in the vicinity prior to conducting the CCTV survey. Council maintenance access to the existing gross pollutant trap located at the rear of 2-4 Lyonpark Road, Macquarie Park, within Shrimptons Creek, must be maintained until works are completed as part of Stage 1. A plan and letter confirming the location			

***Refer Risk Matrix for Risk Rating**

					and permission for Council to access the site shall be provided to Council's City Works Directorate and the Certifier prior to the commencement of any works. The maintenance access shall remain open for all stages of the development.			
11	Protection of heritage	Unintentional destruction of heritage items	12		If during the course of construction, the Applicant becomes aware of any previously unidentified heritage object(s), all work likely to affect the object(s) must cease immediately and the Heritage Division must be notified immediately and consulted with regard to the recommencement of works. This protocol must be included in the induction for all construction workers on the site. If during the course of construction the Applicant becomes aware of any previously unidentified Aboriginal object(s), all work likely to affect the object(s) must cease immediately and EESG informed in accordance with section 89A of the National Parks and Wildlife Act 1974. Relevant works must not recommence until written authorisation from the Heritage Division is received by the Applicant. This protocol must be included in the induction for all construction workers on the site. If any previously undetected	3	FM	Daily

***Refer Risk Matrix for Risk Rating**

					Aboriginal site, artefact or European Heritage item is uncovered during construction, cease work, fence off area, and report to the PM immediately. Archival recording of stack to be carried out prior to works commencing			
12	Truck movements	Accidents during truck movements	15		The following requirements apply: a Works Zone is required if loading and unloading is not possible on site. If a Works Zone is warranted an application must be made to the relevant road authority at least 8 weeks prior to commencement of works on the site. Consent for a Works Zone may be given for a specific period and certain hours of the days to meet the particular need for the site for such facilities at various stages of construction. The consent will be reviewed periodically for any adjustment necessitated by the progress of the construction activities. All demolition and construction vehicles must be wholly contained within the site and vehicles must enter the site before stopping.	4		
12	Moving Plants and Machines Carting Material off site Excavation		10	Protection of Environment Operations Act 1997 (POEO Act) – Section 5.4 Air Pollution:	• Minimise the area of land disturbed during construction and progressively revegetate (if possible). • Equipment storage areas to be defined on site.	4	FM SE Scaffolders	Daily visual monitoring Day sheets Site Plan

***Refer Risk Matrix for Risk Rating**

	Jack Hammering Un protected Stockpiles Demolition Piling	**Dust**		s124, s125, s126	• Dust from the demolition of the structure will be contained through the provision of cloth hording surrounding the scaffolding. Wetting of the area creating dust will control excess dust inside this perimeter. • Mud and soil will be removed from wheels and bodies of construction vehicles and equipment before they enter public roads • Clean public roads of dirt resulting from construction works daily and/or as required. • Re-program construction activities to avoid periods of strong winds if dust generation is a problem. If not possible to re-program, use water to dampen cleared areas and stockpiles. • All stockpiles to be covered and protected from silt runoff and debris in high winds • Trucks containing materials that have the potential to create dust during transport to and from site will be covered and their tailgates secured, as required. • Dust monitoring to be conducted where required and to meet council regulations		Operators FM PM Operators	
13	Faults in Plants, Machines and Vehicles	**CO2 Emissions**	10	Protection of Environment Operations	• Supervisor/contractors to undertake and record maintenance	4	FM / Operators	Daily visual monitoring

***Refer Risk Matrix for Risk Rating**

				Act 1997 (POEO Act) - Section 5.4 Air Pollution: s124, s125, s126	checks of plant/equipment brought to site to ensure they do not have smoky exhausts. • Ensure machinery or plant is not left running idle when not in use for extended periods. • No burning of vegetation on site.		Operator FM	Day sheets Plant Inspection Checklists
14	Out-of-hours work Deliveries outside work hours Moving Plants and Machines outside work hours Any work activities outside the allowable work hours	**Operating Hours**		Local Council Regulations	• Out-of-hours work or deliveries only to occur if approved by the PM. All noise complaints to be dealt with by PM. • Minimise noise impact and general disruption to nearby residents. • If night works are conducted, ensure approval and requirements have been met by council • If regular work hours are changed, notify appropriate authorities and clients for approval to change times. •		PM All staff / FM	
15	Excavation of services Cranes Boring Piling Compacting	**Damage to Services**		N/A	• Obtain underground network information from Dial Before You Dig • Perform onsite inspections for presence of assets • Observe minimum depths and clearances as stated on the plans • Pothole to establish the location of services • Protect and support exposed		PM FM FM FM FM FM	Asset Owner Plans Daysheets Permit to Excavate SWMS Toolbox Talk

***Refer Risk Matrix for Risk Rating**

					infrastructure • Dig by hand when excavating close to known services • DUDDS to conduct service search prior to construction if services are unknown •			
16	Excavation of services Boring Oxy & Acetylene cutting Grinding	**Fires Explosions Gas Leaks**		N/A	• Obtain underground network information from Dial Before You Dig • Perform onsite inspections for presence of assets • Observe minimum depths and clearances as stated on the plans • Pothole to establish the location of services • Protect and support exposed infrastructure • Dig by hand when excavating close to services • Hot work permits to be issued while conducting hot works • Area to be clear of flammable liquids and solids while cutting • Where applicable Emergency procedures shall be displayed in a prominent position within the site working area. All staff to be familiar		PM FM FM FM FM FM	Asset Owner Plans Daysheets Permit to Excavate SWMS Toolbox Talk Hot Work Permits

***Refer Risk Matrix for Risk Rating**

					with the location and contents of the emergency procedures. •			
17	Contaminated soil is carted off site and disposed of improperly	**Contamination & Pollution**			• Truck Tipping / Waste Sheets to be used to track removal of contaminated fill • Where possible, stockpile and reuse fill • Any contaminated material carted off site is to be disposed of at an approved DEC landfill • Any fill being removed from site is to be tarped and secured to prevent spillage in transit • Trucks are to be wheel washed before leaving site. Egress from the wheel wash area is to be clean and free of debris. • Records of tracking waste log to be maintained on all disposed material. Test certificates required where applicable		FM FM FM Operators FM	DECCW Guidelines for Concreting Contractors Site Inspection Checklist Day sheets Waste Log Waste Dockets Laboratory Analysis
18	A spill or disposal of a hazardous substance				• No bulk storage of hazardous substances or dangerous goods at any site. • Provide bunded and impervious storage areas for fuels and chemicals in accordance with AS1940 – *Storage and Handling of Flammable and Combustible Liquids*. Bunded areas shall have a storage capacity of 110% of the volume of stored. No general		FM FM FM	Site Inspection Checklist Day sheets Site Plan showing bunded chemical storage area

***Refer Risk Matrix for Risk Rating**

					construction material will be stored in this area. • Ensure refuelling and servicing, or any other activity that may result in the spillage of a chemical, fuel or lubricant where contamination of a waterway could occur, is undertaken in a manner that minimises risk to the environment (eg. refuelling with a Mini-tanker with a spill kit and emergency response procedures). • Where applicable an Emergency procedure shall be displayed in a prominent position within the site working area. All staff to be familiar with the location and contents of the emergency procedures. • Spill kit will be maintained on site when chemicals or fuels are stored on site. Spillages of chemical will be cleaned up immediately		PM FM	SDS Mini tanker refuelling procedure or Toolbox record of manual refuelling procedure Toolbox meeting for spill kit use Site Induction
19	Untidy Site Inadequate site records or reporting Dust from work activities	**Community Complaints**		N/A	• Ensure the work site and surrounding area is kept clean and tidy. • Ensure site signage is hung straight and replaced (within 5 working days) if damaged or stolen. • Shade cloth to be erected around the site		FM / PM	Complaint Register Toolbox meetings Site induction Agreements

***Refer Risk Matrix for Risk Rating**

	Dirt on road from vehicles exiting the site Night Works Noise from work activities				• Ensure community issues (including Systems Defects) are covered in induction and site toolbox meetings. • Client to be kept informed at all times of our proposed construction activities and any potential impacts on their operation. Where construction activities are to be conducted outside of agreed circumstances, both the client and Christie Civil are to reconsider activity where possible. When this is not possible, the client is to facilitate communication of activities to residents.			

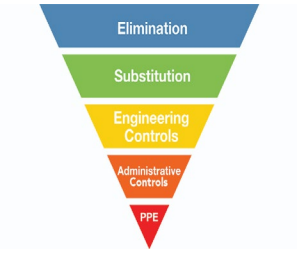
***Refer Risk Matrix for Risk Rating**

SITE ENVIRONMENTAL ASPECTS, IMPACTS & SAFEGUARDS

RISK MATRIX

Probability			RISK				
Descriptive	**Qty/yr**	**Relational**					
Very High	>1-0.1	Happens to you often	5	10	15	20	25
High	0.1-0.01	Likely to occur in your lifetime	4	8	12	16	20
Medium	0.01-0.001	Likely to occur to someone you know	3	6	9	12	15
Low	0.001-0.0001	Does occur in industry	2	4	6	8	10
Very Low	< - 0.0001	Extremely unlikely world event	1	2	3	4	5
		Safety	First aid (minor)	First aid (Major)	Lost time injury	Disability, major health issue	Fatalities
		Environment	Negligible minor spills	Minor effects, neighbour/council	Significant release/damage	Major issues, potential for news coverage	Massive Damage, Press/TV coverage

Risk Reduction Methods



All risks should be minimised as far as reasonably possible

RISK ACCEPTANCE

<5 - Acceptable
>5 - Avoid/mitigate
>10 - Mitigate/Unacceptable (address concerns)
>20 - Address concerns immediatley

If a 15 or greater is received in identifying the site aspects and impacts in the risk matrix, it is then considered significant. In this circumstance, additional supervision, implementation and corrective controls need to be efficiently and effectively constructed in order to minimise the risks of its impact or eradicate it completely. An SOPF3.02.11 - Emergency Preparedness and Response Plan, is required for risks rated greater than 15.

***Refer Risk Matrix for Risk Rating**

APPENDIX 3

WEEKLY SITE ASSESSMENT CHECKLIST

APPENDIX 4

TRAFFIC MANAGEMENT PLAN

Construction Traffic Management Plan (CTMP)

Ivanhoe Estate Stage 1B Civil Works
Development Application: SSD 8903
CTMP Version: 1.0
LGA: City of Ryde
Date: 11 March 2022

CTMP Prepared for: Christie Civil Pty Ltd

Document Release	
Document Number:	SSD 8903
Title:	Construction Traffic Management Plan (CTMP) - Ivanhoe Estate Stage 1B Civil Works
Author:	Kyle Fieg

Table of Modifications				
Revision	Date	Modifications to content	Author	Signature
1.0	11/3/2022	Initial Submission	Kyle Fieg	K. Fieg

PWZTMP Qualified Person	
Name:	Kyle Fieg
Role:	Traffic Planner
Organisation:	The Traffic Planner
Qualification Number:	TCT0041658
Signature:	K. Fieg
Date:	11/3/2022

Table of Contents

1. Introduction 5
1.1 Purpose of this Plan 5
1.2 Abbreviations and Terminology 6
1.3 Legislative Requirements 6

2. Development and Construction Details 10
2.1 Proposed Stages of Work 10
2.2 Hours of Work 10
2.3 Daily Workforce 11
2.4 Existing Conditions 11
2.5 Surrounding Road Classifications 11
2.6 Site Aerial View 13

3. Proposed Development Traffic Impact 13
3.1 Construction Access 13
3.2 Hoardings and Site Fencing 14
3.3 Loading / Unloading 14
3.4 Site Accommodations 14
3.5 Site Parking 14
3.6 Material, Plant and Spoil Bin Storage Areas 14
3.7 TfNSW Road Occupancy Approvals 14
3.8 Local Council Permit Approvals 15
3.9 Transport Management for Service, Delivery, and Garbage Vehicles 15
3.10 Impacts on Public Transport 15
3.11 Emergency Services 15
3.12 Pedestrians 15
3.13 Cyclists 16

4. Development Access Management Arrangements 17
4.1 Vehicle Movement Plan 17
4.2 Impact to Residents, Businesses and the Public 17
4.3 Neighbouring Properties 17
4.4 Construction Traffic and Heavy Vehicles 17
4.5 Types of Trucks Approaching Site 18
4.6 Estimated Daily Volume: 18
4.7 Abnormal and Oversize/Overmass Loads 18
4.8 Vehicle Cleansing 19

5. On-Site Traffic Management 20
5.1 Site Traffic Control 20
5.2 Traffic Control Signs and Devices 20
5.3 Sequence for erection and removal of signs and devices 21
General 21
Multi-lane roads 22
Removal 23
5.4 Communications Strategy 23
Worksite Communications 23

Stakeholder Works Notifications *23*
Emergency Services Notifications *23*
5.5 Site Contact Details 23
6. Appendix A – Traffic Control Plans 24
7. Appendix B – Vehicle Movement Routes 27
8. Appendix C – Project Plans and Diagrams 29

1. Introduction

The Traffic Planner has been commissioned by Christie Civil Pty Ltd to prepare a Construction Traffic Management Plan (CTMP) to be implemented during the construction project located at Ivanhoe Estate Stage 1B Civil Works. This TMP is required to be submitted and approved by City of Ryde prior to the commencement of works.

This Construction Traffic Management Plan (CTMP) and associated Traffic Control Plans (TCP) includes the provision for the safe movement of vehicular and pedestrian traffic, the protection of workers from passing traffic, the provision for access to properties located within the limits of the project, the provision of traffic controllers and traffic control measures, the installation of temporary signs and safety devices as required at Ivanhoe Estate Stage 1B Civil Works.

This Construction Traffic Management Plan (CTMP) & associated Traffic Control Plans (TCP) describes and illustrates the locations of proposed Ingress & Egress points for Construction Vehicles, standing of delivery vehicles, Standing of Plant (if required) and Traffic Control and Pedestrian Control measures for the site.

This Construction Traffic Management Plan (CTMP) & associated Traffic Control Plans (TCP) have been prepared to satisfy all conditions relating to a CTMP as set in the approved Development Application, SSD 8903, relating to this project.

1.1 Purpose of this Plan

The purpose of this CTMP is to satisfy City of Ryde consent conditions and describe how The Applicant proposes to manage construction vehicles, traffic and pedestrian movements safely whilst carrying out their respective activities.

The objectives with respect to the Construction Traffic Management Plan ("CTMP") are to:

- Ensure the safety of staff, the general public, pedestrians, cyclists and traffic,
- To satisfy Council's conditions related to Traffic, Transport and Access.
- To actively monitor traffic impacts related to the construction works so that information can be applied to the planning and implementation of traffic control plans
- Keep all site traffic delays to a minimum,
- Maintain satisfactory property access,
- Minimise disturbance to the environment and
- Meet the requirements of relevant Australian Standards (specifically AS1742.3), TFNSW G10 Traffic Management and the TFNSW Traffic Control at Worksites Manual V6.0.

1.2 Abbreviations and Terminology

The following terms, abbreviations and definition are used in this plan:

Terms	Explanation
ITCP	Implement Traffic Control Plans
PWZTMP	Prepare Work Zone Traffic Management Plan
ROL	Road Occupancy Licence
SWMS	Safe Work Method Statement
TfNSW	Transport for New South Wales
TGS	Traffic Guidance Scheme
TMP	Traffic Management Plan
TTM	Temporary Traffic Management
VMP	Vehicle Movement Plan

1.3 Legislative Requirements

This Construction Traffic Management Plan (CTMP) complies with Australian Standard 1742.3-2019 Manual of uniform traffic control devices, Part 3: Traffic control for works on roads. All TCP's have been drawn to the TFNSW Traffic Control at Worksites Manual V6.0 standards,

All personnel dealing with traffic control, being either contractors or sub-contractors are to have the following current accreditation, for the management of each item listed below:

Qualification	Requirements	Restrictions
Traffic Controller This qualification provides the necessary certification to control traffic with a prescribed traffic control device.	Persons holding this qualification are permitted or required to: • Stop or direct road users using a STOP/SLOW bat or other accepted traffic control device; • Maintain traffic incident reports; • Operate a 2-way radio; • Understand the TGSs for the site; • Check traffic control signs are installed in accordance with the relevant TGS; • Assess and respond to changes in the environment, e.g., traffic volumes, weather conditions, road conditions, WHS and operational requirements; and	Persons holding this qualification must not: • Select or adjust a site suitable TGS; • Implement a TGS; • Modify a TGS; or • Design a TGS.

	• Carry out risk assessments for personal safety.	
Implement Traffic Control Plans This qualification allows for qualified personnel to set up and work with TGSs at a work site and complete safety inspections.	Persons holding this qualification are permitted to: • Set up, monitor, and close down traffic control devices according to nominated TGS; • Identify safety implications of traffic control at roadworks; • Check, clean and store equipment on completion of work and close down a TGS; • Select an approved TGS to suit site conditions, traffic volumes and work activities; • Make adjustments to an existing TGS within the tolerances specified in *Section 7.10.3 Tolerances on positioning of signs and devices in the TCWSM V6;* • Conduct an onsite check of a TGS to identify risks and hazards; • Ensure spacing between signs and traffic control devices is in line with a TGS; • Maintain traffic incident reports; and • Monitor traffic controllers.	Persons holding this qualification must not: • Control traffic with a STOP/SLOW bat or other traffic control device; • Make adjustments to an existing TGS which exceeds the tolerances specified in *Section 7.10.3 Tolerances on positioning of signs and devices in the TCWSM V6;* or • Design a TGS.
Prepare Work Zone Traffic Management Plan This qualification allows for qualified personnel to design and modify Traffic Management Plans (TMPs), Vehicle Movement Plans (VMPs) and traffic guidance schemes (TGSs).	Persons holding this qualification are permitted to: • Prepare a Work Zone TMP; • Collect all required information about a given roadwork project to enable the preparation of a TGS; • Design a TGS, based on risk assessment, statutory and regulatory requirements, standards, road authority requirements and project brief; • Select and modify a TGS based on risk assessment, statutory and regulatory requirements, standards, road authority requirements and project brief;	Persons holding this qualification must not: • Control traffic with a STOP/SLOW bat or other traffic control device; or • Implement a TGS.

	• Determine the recommended spacing between signs and traffic control devices in line with standards, measure width of trafficable surface and calculate edge clearances to barriers, cones and clearance to work personnel; • Undertake safety inspections/checks on the effectiveness of TMPs and TGSs; • Conduct an onsite check and inspection of the plan and to identify any hazards or risks; and • Seek approvals required for a TMP and TGS	

Table 1. Traffic Management Qualifications

In accordance with City of Ryde all traffic control work, excavation, demolition and construction activities must be undertaken in accordance with the approved conditions of consent.

The CTMP needs to specify, but not limited to, the following:

Prior to the commencement of any works, a Construction Pedestrian and Traffic Management Plan (CPTMP) prepared by a suitably qualified person shall be endorsed by TfNSW (Sydney Coordination Office) and submitted to the Certifier. The CPTMP must be prepared in consultation with Council, TfNSW (Sydney Coordination Office), and TfNSW (RMS). The CPTMP shall address (but not be limited to):
a) location of the proposed work zone;
b) haulage routes;
c) construction vehicle access and traffic control arrangements;
d) proposed construction hours;
e) estimated number of construction vehicle movements;
f) any changes required to on-street parking;
g) construction program;
h) any potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction;
i) cumulative construction impacts of projects considering any traffic and pedestrian management plans prepare for these projects to ensure that work activities are coordinated and managed to minimise impacts on the road network. Information relating to cumulative construction impacts to be sourced from TfNSW (Sydney Coordination Office);
j) measures to ensure construction vehicles do not arrive at the site or surrounding areas outside approved hours;

k) measures proposed to mitigate any associated general traffic, public transport, pedestrian access and cyclist impacts/conflicts;
l) measures to encourage public transport use and other non-car travel options by construction workers.

Prior to the commencement of works, a copy of the CPTMP demonstrating compliance with the above must be submitted to TfNSW and the Planning Secretary.

Please note that the provision of any information in this CTMP will not exempt the Applicant from correctly fulfilling all other conditions relevant to the development conditions of consent for the project.

2. Development and Construction Details

NOTICE OF DETERMINATION - APPROVAL *Issued under Section 4.16(1)(a) of the Environmental Planning and Assessment Act, 1979*	
Development Application No.	SSD 8903
Applicant	NSW Land and Housing Corporation
Land to be developed	Ivanhoe Estate comprising Ivanhoe Place, Wilcannia Way, Nyngan Way, Narromine Way and Cobar Way (Lot 100 DP1262209), part of 2-4 Lyonpark Road (Lot 1 DP859537) and portions of Shrimptons Creek adjacent to Lot 1 DP859537 to the centre line of the creek, Macquarie Park
Approved development	Stage 1 development application for the redevelopment of the Ivanhoe Estate, including: • site preparation works, including removal of trees, demolition, bulk earthworks and excavation • construction of new roads, bridge over Shrimptons Creek and new road connection to Lyonpark Road • construction of two residential apartment buildings (Building A1 and Building C1) with basement car parking: - Building A1 with 269 apartments, 233 car parking spaces and a child centre - Building C1 with 471 apartments and 346 car parking spaces • landscaping and public domain works • amalgamation and subdivision.

Project Plans and Diagrams are located in Appendix C – Project Plans and Diagrams.

2.1 Proposed Stages of Work

- TBC – Staging and Methodology to be provided by the contractor.

2.2 Hours of Work

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

a) between 7.00 am and 7.00 pm, Mondays to Fridays inclusive; and
b) between 8.00 am and 4.00 pm, Saturdays.

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

Activities may be undertaken outside of these hours if required:

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

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

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

a) 9.00 am to 12.00 pm, Monday to Friday;
b) 2.00 pm to 5.00 pm Monday to Friday; and
c) 9.00 am to 12.00 pm, Saturday.

2.3 Daily Workforce

Average daily workforce of approximately 20-30 people during different stages of the development.

2.4 Existing Conditions

At the time of developing this CTMP, there are no existing works or events that have been identified in the area that will affect the plans detailed in this CTMP. During the course of the project, this may change. Consultation will occur between all parties and any conditions outlined in any Council and or TFNSW approval must be implemented and adhered to.

2.5 Surrounding Road Classifications

Road Name	Road Type	Restrictions	Authority
Herring Road	Regional Road	50km/h	TfNSW
Epping Road	State Road	70km/h	TfNSW
Lyonpark Road	Local Road	50km/h	City of Ryde

Table 2. Road Classification


Local Government Areas
State Roads
Regional Roads
Local Roads
Quandong Reserve
Wilga Park
Waterloo Rd
Waterloo Rd
The Ranch
Epping Rd
TPG
Memjet Australia
Optus Campus
Sydney Building G
Booth St
Dora St
Avaya House
Batch ZKK
Giffnock Ave
Coolinga St
Scott St
Adelphi Rd
Optus Dr
NextDC
ELS – Field 3
ELS – Field 1
Greenwood Park
North Ryde
Guest House
Paul St
Mooltan Ave
Quandong Reserve
Wilga Park
Epping Rd
The Ranch
Liberty Park
Wilding St
Memjet Australia
Lyonpark Rd
Booth St

2.6 Site Aerial View

3. Proposed Development Traffic Impact

3.1 Construction Access

All construction works will be completed within the project boundary. Construction access into the site will be from Lyonpark Road. The maximum size vehicle accessing the site will be a **19m Truck and Dog Trailer**. Refer Appendix B for Vehicle Movement Routes.

No queuing or marshalling of trucks is permitted on any public road. If there is not adequate space on-site, trucks will be turned away and must not queue in the surrounding areas. All construction vehicles will be coordinated to site only when sufficient space is available. Circulating construction vehicles on the network will not be tolerated.

Where used, Traffic Controllers are not to stop traffic on the public street(s) to allow trucks to enter or leave the site. They must wait until a suitable gap in traffic allows them to assist trucks in entering or exiting the site.

3.2 Hoardings and Site Fencing

Site fencing will be used to secure the work areas from unauthorised access.

3.3 Loading / Unloading

All loading and unloading associated with construction will be accommodated on site

If a Works Zone is warranted an application must be made to the relevant road authority at least 8 weeks prior to commencement of works on the site. Consent for a Works Zone may be given for a specific period and certain hours of the days to meet the particular need for the site for such facilities at various stages of construction. The consent will be reviewed periodically for any adjustment necessitated by the progress of the construction activities.

All demolition and construction vehicles will be wholly contained within the site and vehicles must enter the site before stopping.

3.4 Site Accommodations

All site accommodations will be located wholly within the site compound on not on public lands or the road reserve.

3.5 Site Parking

All site staff, workers and contractors related to the project are to park in a designated off-street parking or encouraged to use public transport.

No truck pooling/parking will be permitted at any time during the project at any frontage to the project or any other roadway within the City of Ryde Local Government Area.

3.6 Material, Plant and Spoil Bin Storage Areas

These areas will be allocated within the construction site boundary. Skip bins will be contained wholly within the site boundary. No storage of materials, plant or spoil will be allowed on public land or public roads. All waste/material will be collected on site in a position for easy access for both use on site and removal by trucks. All removal trucks will have the load covered by tarpaulin or other means to secure the load and will adhere to the approved travel routes as described in this CTMP.

It is noted the Contractor must obtain a permit from the City of Ryde regarding the placing of any plant/equipment on public ways, should this ever be required.

3.7 TfNSW Road Occupancy Approvals

Any works requiring authorisation by the TfNSW network such as full road closures, works on a state road or works within 100m of traffic signals require an ROL and will need to be approved by the TfNSW prior to works starting.

ROL's will be approved by TfNSW to specify TCP requirements. All works under an ROL approval are to be undertaken in accordance with all TfNSW conditions of approval outlined on the ROL.

This includes approval for times and days when each TCP can be operated. Approved ROLs will accompany the TCP to which it applies to during the operation of each TCP.

3.8 Local Council Permit Approvals

Any use of Council property for construction purposes shall require the appropriate approvals prior to such work commencing. This includes occupying Council property for storage or other non-construction activities.

Permit approvals must be obtained from the City of Ryde and need to be lodged and approved prior to works proceeding. Any proposed occupation of the roadway or footway will need to be referred to the City of Ryde. Additional approvals may be required for authorities such as Transport for NSW and the State Transit Authority. Emergency services will also need to be notified.

3.9 Transport Management for Service, Delivery, and Garbage Vehicles

No impact on existing services is expected during the works. Stakeholder consultation will occur throughout the project should this change.

3.10 Impacts on Public Transport

This project is not expected to have any significant impact on public transport timetables.

Existing access arrangements and services will be maintained comparable to the existing conditions.

The continual consultation will occur throughout the project. Notification of these changes will be made to the public and stakeholders with the use of notification signage and Roads and Maritime accredited traffic controllers.

3.11 Emergency Services

Police will be notified of any works on the road reserve that block or change the direction of travel of the road reserve, such as full road closures.

A 3m isle is to be maintained at all times during any road works to ensure emergency vehicle can pass if required. If a full road closure is in place, alternative routes will be used.

3.12 Pedestrians

A permit application and approval will be obtained from City of Ryde prior to any occupation of the footway or any footway closures. Consideration will be taken when planning for disabled persons, and in general, routes should be as short of a distance as possible.

Pedestrian Ramps may be required where a smooth transition from the kerb is not available.

The proposed signage for pedestrian management will comply with AS1742.3 and AS1742.10, inclusive of pram ramps.

It is noted that Pedestrians may be held only for very short periods to ensure safety when trucks are leaving or entering, but pedestrians will not be stopped in anticipation, i.e. at all times, the pedestrians have the right-of-way on the footpath, not the trucks.

3.13 Cyclists

Cyclists will be subject to the same Traffic Management Controls as registered road users and will always have the right of way over construction works and vehicles accessing the site.

4. Development Access Management Arrangements

Dedicated temporary construction site driveway entrances and exits will be signposted. This will remain in place to safely manage pedestrians and construction-related vehicles to the Site frontage's roadways and footpaths.

If required, Authorised Traffic Controllers will be in place to assist with vehicle and pedestrian access.

4.1 Vehicle Movement Plan

A vehicle movement plan has been developed for this project and is located in Appendix B.

4.2 Impact to Residents, Businesses and the Public

This project is not expected to have any significant impact on public transport and cyclists. Existing access arrangements and services to other transport modes will be maintained comparable to the existing situation.

Adequate provision for pedestrians and cyclists will be made for current movements along all frontages and intersecting streets.

4.3 Neighbouring Properties

Access to neighbouring properties will be maintained at all times. Local community notification will be undertaken with all stakeholders prior to any changes to and/or impact on the road network.

Notifications will be provided to all impacted stakeholders at least 3 days prior to works starting. The notification will include contact details of the Traffic Control Management and the Site Management.

4.4 Construction Traffic and Heavy Vehicles

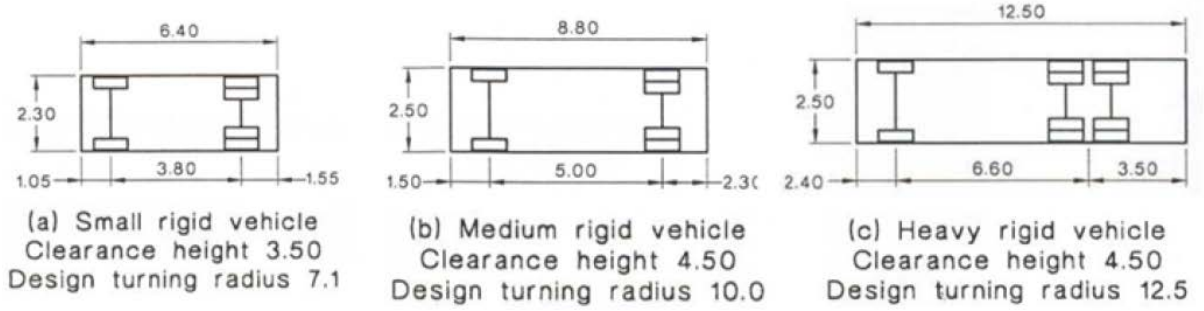
Typically, the most high-risk movement for construction vehicles occurs when vehicles are entering or exiting the construction site to and from the external road network. The management of construction access will include the following:

- Installation of truck warning signs on temporary construction access road;
- Where practicable, heavy vehicles will avoid using local roads;
- Authorised Traffic Controllers will be utilised to assist with safe access and egress of public vehicles around the work area where required.

4.5 Types of Trucks Approaching Site

There will be a combination of small rigid vehicles (SRV's 6.4m), medium rigid vehicles (MRV's 8.8m), heavy rigid vehicles (HRV's 12.5m), Articulated Vehicles (AV 19m) and Truck and Dog Trailer (19m) accessing and egressing from the site.

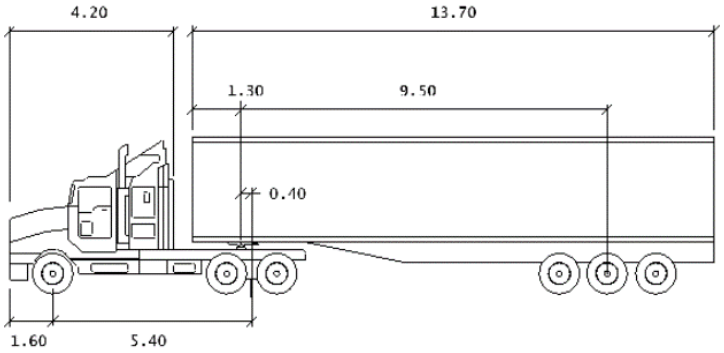
Vehicle Sizes by Type



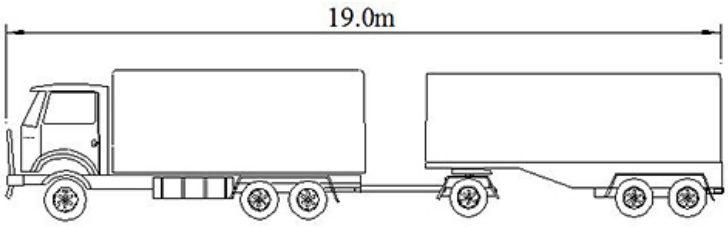
(a) Small rigid vehicle
Clearance height 3.50
Design turning radius 7.1

(b) Medium rigid vehicle
Clearance height 4.50
Design turning radius 10.0

(c) Heavy rigid vehicle
Clearance height 4.50
Design turning radius 12.5



Articulated Vehicle 19m



Truck and Trailer 19m

4.6 Estimated Daily Volume:

The estimated number of daily truck movements is 10-15 per day, with a peak of up to 50 movements per day during large concrete pours.

4.7 Abnormal and Oversize/Overmass Loads

Oversize and over-mass vehicles are not allowed to travel on Local Roads (unless approval for a one-off occasion is obtained from the City of Ryde Traffic Operations Unit).

Requests to use these vehicles must be submitted to City of Ryde 28 days prior to the vehicle's scheduled travel date. Specific Traffic Management Plans will be developed for each abnormal movement and will be submitted for assessment to the relevant local and regulatory authorities on a case-by-case basis.

This is not expected to be required on this project.

For more information, please contact the National Heavy Vehicle Regulator (NHVR) on 1300 696 487 or www.nhvr.gov.au.

4.8 Vehicle Cleansing

Prior to the commencement of work and during construction works, suitable measures are to be implemented to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the Site.

All waste/material will be collected on site in a position for easy access for both use on site and removal by trucks. All removal trucks will have the load covered by tarpaulin or other means to secure the load and will adhere to the approved travel routes as described in this CTMP.

5. On-Site Traffic Management

5.1 Site Traffic Control

Traffic Management measures will be implemented on site to ensure the safe use of the roadway and surrounding areas; these will include but not be limited to;

- Authorised Traffic Controllers will be posted at the entry and exit points, if required.
- Advanced Warning Signs will be erected and or mounted as required. Refer to Appendix A for relevant TCP and associated signage requirements.
- All works associated with control or redirection of traffic must have an approved TCP associated with the works, and any relevant permits must be in place and available for view on site at all times.
- All construction vehicles must follow the instruction of the Authorised Traffic Controllers. This will be outlined in the site safety induction. The approved truck route plan shall form part of the contract and must be distributed to all truck drivers.
- Authorised Traffic Controllers must be inducted into the site prior to the start of the shift. Authorised Traffic Controllers must be trained on the conditions outlined in this TMP and associated planning documents.
- This TMP and all associated planning documents must be available for view on site at all times.

5.2 Traffic Control Signs and Devices

Traffic control devices are an important tool for influencing the safety of road users, in particular where temporary traffic controls are implemented at work sites.

The following traffic control details shall be strictly adhered to during this project:

- Advance Warning Signs shall be erected accordingly on each approach to the job site.
- Work for the shift shall be discussed with the team during the toolbox talk and SWMS Induction prior to commencement.
- All signs shall be of a size appropriate for residential streets with approach speeds of no more than 60km/hr.
- Sign spacing shall be within -10% to +25%.
- Contradictory signs to be covered.
- Do not cross open lanes to set out signs.
- Cones to be 700mm in height and reflective.
- Stop traffic at times when there is not enough lateral clearance.
- Allow for cyclists and parked cars in setting out T/C equipment.
- Need an escape route for traffic controllers.
- Prevent other vehicles following when Construction Vehicles are turning into site.
- All personnel, plant and equipment to keep a minimum of 1.2m from traffic.
- Record and initial any changes to TCP.
- Complete TCP checklist prior to implementation of TCP

All signposting installed throughout the project will comply with the requirements outlined in the TFNSW's TCWS Manual V6.0 AUSTROADS Guide to Traffic Engineering Practice, Part 8 – Traffic Control Devices and the Relevant parts of Australian Standard 1742.3-2009.

Temporary signposting will be implemented as per the detailed traffic plans. As documented in Appendix A – Traffic Control Plans.

5.3 Sequence for erection and removal of signs and devices

General

The sequence for installation and removal of signs and devices must be considered in the TMP and documented on the TGS or another site document such as a SWMS. The installation and removal of signs and devices must:

- Be undertaken in accordance with the procedures shown on the TGS or another document;
- Be planned to be in the direction of normal traffic flow;
- Not require workers to cross roads or carriageways on foot; and
- Be undertaken with a work vehicle with a flashing arrow or rotating or flashing light(s) is positioned between the workers and approaching traffic.

Special consideration must be given for the removal of signs on central medians and barriers on multi-lane divided carriageways, i.e., a site-specific TGS or use of a work convoy etc.

Before work commences, signs and devices at the work site must be installed in a sequence that is safe and efficient. After the work area has been located, via the use of a GPS, survey, landmarks, side streets or chainage, setting up a site to install signs and devices should be in accordance with the general procedures described below:

2-lane, 2-way roads

For 2-lane, 2-way roads, installation should occur in the following order:

1. Install termination signs (if no side roads).
2. Install on side streets.
3. Install in the non-working lane (unaffected direction).
4. Install in the working lane (affected direction).

Figure below provides an example sign installation sequence for a 2-lane, 2-way road.

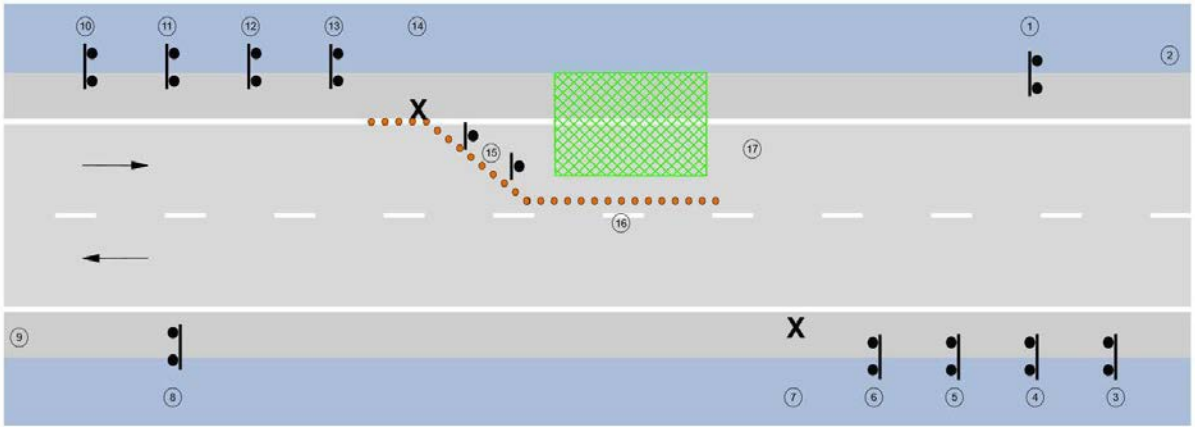


Table 3. Example sign installation sequence for a 2-lane, 2-way road

Multi-lane roads

For multi-lane roads, installation should occur in the following order:

1. Install signs and devices for the non-working lane (un-affected direction).
2. Install signs and devices for the working lane (affected direction).

Special consideration must be given to the installation of signs on central medians and barriers on multi-lane divided carriageways. In such cases, a site-specific TGS or use of a convoy may be required.

Figure below provides an example sign installation sequence for a multi-lane road.

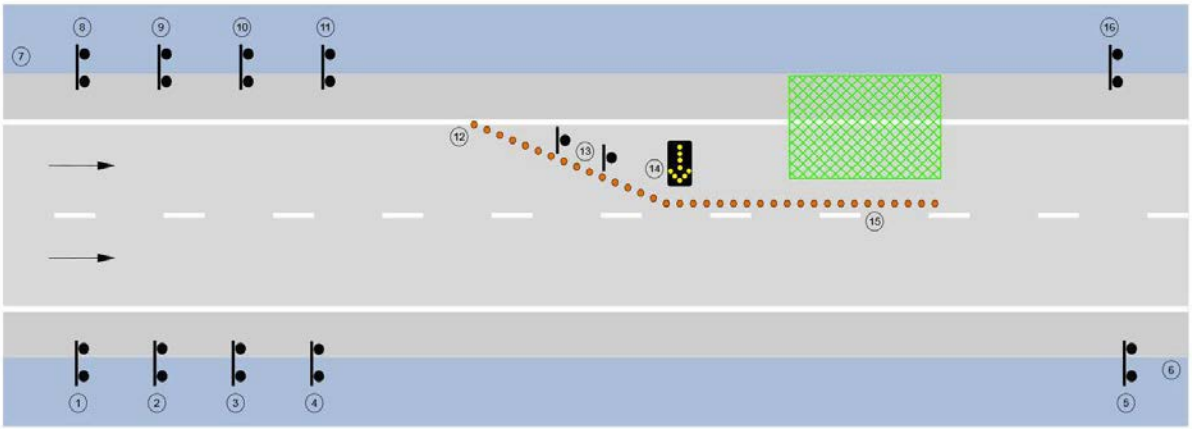


Table 4. Example sign installation sequence for a multi-lane road

A different implementation sequence may need for site specific circumstances, e.g., install End Roadwork and reinstate the existing permanent speed limit first.

Where a work area is moving progressively along the road, relocation of the signs ahead should take place in accordance with the sequence described above. Those behind should be relocated in the reverse sequence.

For long-term or recurring short-term sites, consideration should be given to marking the desired location of each sign or device on the road for easy placement.

Removal

Removal of traffic control signs and devices should be undertaken in the reverse order of installation, progressing from the work area out toward the approaches. On motorway type carriageways, the removal of signs can be difficult in this sequence, in which case, signs should be removed in the same order that they were installed. The work vehicle should be positioned between the workers and approaching traffic when removing signs in this manner.

When removing delineation devices, such as cones, bollards or barrier boards used to close a lane, an advanced warning vehicle should be used to warn road users of workers on foot and a work vehicle must also be positioned between the workers and approaching traffic.

A work vehicle must only proceed in a forward direction towards approaching traffic along the closed roadway if it is determined by the PWZTMP or ITCP qualified person that it is safe to do so. This should not occur at night time where it may create motorist confusion or distraction, such as headlight glare.

5.4 Communications Strategy

Worksite Communications

There will be two-way communications throughout the worksite to assist with traffic management of vehicles travelling into, through and/or around the worksite.

Stakeholder Works Notifications

Notifications will be provided to all impacted stakeholders. Local community notification and consultation processes will be undertaken with all stakeholders prior to any changes to or impact on the road network. The builder's direct contact number will be provided to businesses adjoining or impacted by the construction work and the Transport Management Centre and Sydney Coordination Office within Transport for NSW to resolve issues relating to traffic, public transport, freight, servicing and pedestrian access during construction in real time. The applicant is responsible for ensuring the builder's direct contact number is current during any stage of construction.

Emergency Services Notifications

Emergency Services will be informed in a timely manner of relevant activities proposed within this CPTMP that affect the use of the roadway. Approval from the local area command will be required for all temporary full road closures including changes to road network configurations.

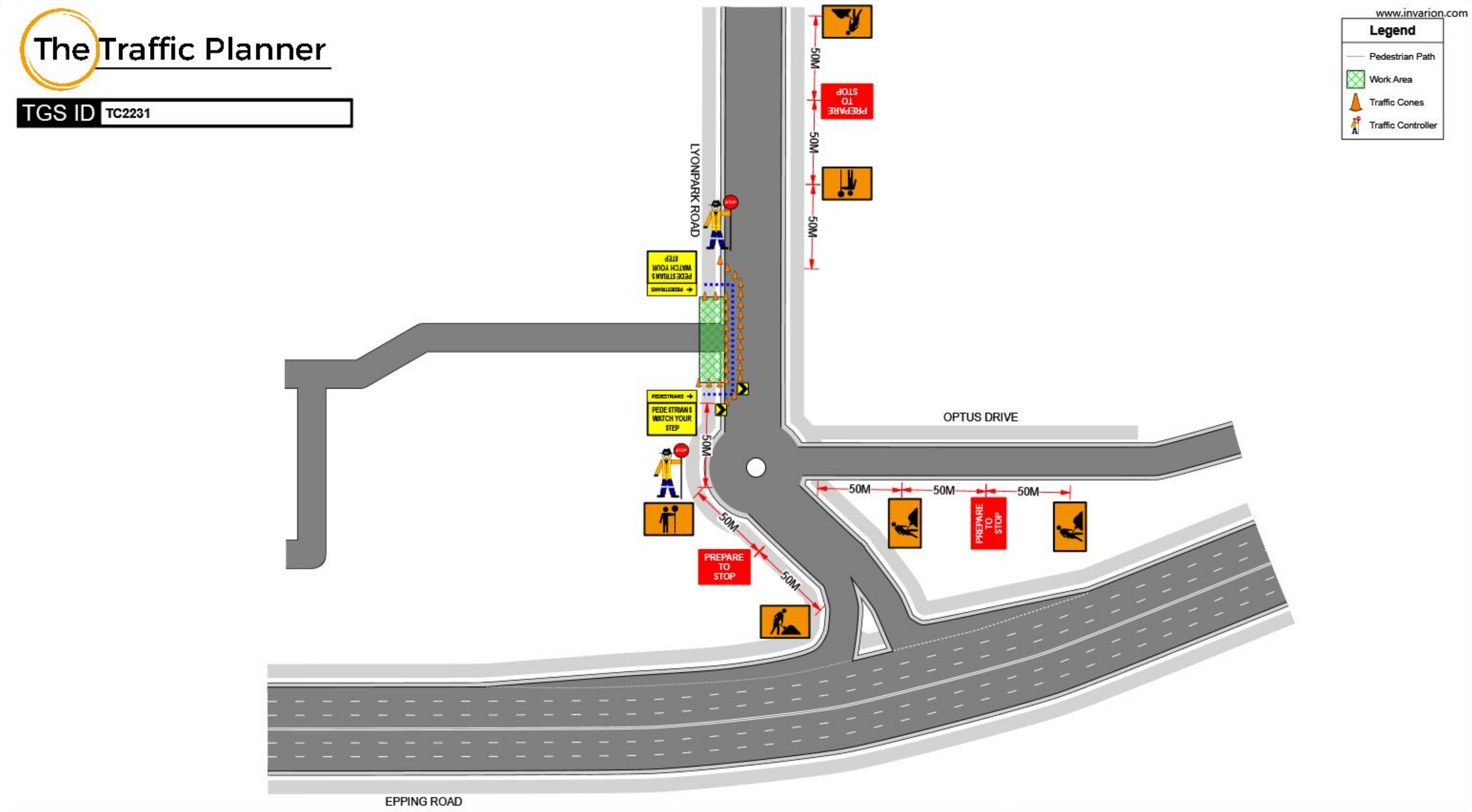
5.5 Site Contact Details

Name	Position	Contact #
Martin Carey	Construction Manager	0412 004 164 02 9552 3077

Table 5. Key Contacts

6. APPENDIX A – TRAFFIC CONTROL PLANS

SEE OVER PAGE



CLIENT: Christie Civil Pty Ltd
PROJECT: Ivanhoe Estate Stage 1B Civil Works
LOCATION: Lyonpark Road, Macquarie Park NSW
SCOPE OF WORKS: Pedestrian Management around work area
LCA & MUNICIPALITY: City of Ryde
DATE: 10/3/2022 TCP EXPIRY: 10/3/2023
TMP LICENCE: TCT0041658 TYPE: PWZ
AUTHOR: Kyle Fieg SIGNATURE: K. Fieg

THIS TRAFFIC GUIDANCE SCHEME IS BASED ON THE NSW RMS TCAW MANUAL V6.0 & AS1742.3-2019

APPROVALS / PERMITS TO BE ONSITE AT ALL TIMES

Device Spacing:

Purpose and usage Recommended	Approach speed of traffic km/h	max spacing, m
All purposes	≤ 55	4
	56 to 75	12
	≥76	18
At divided road crossovers to transfer traffic to the opposing roadway	All Speeds	2
Protecting freshly painted lines	≤75	24
	≥76	60*
Temporary Signposts	≤70	24
	≥70	60

(* This spacing may need to be reduced on curves or crests,or if the row of cones is not clearly defined at night.)

Based on AS 1742.3-2009

Taper Lengths:

Existing Speed Limit	Traffic Control Taper	Lateral Shift Taper	Merge Taper
45 or less	15	15	15
46 to 55	30	15	30
56 to 65	60	30	60
66 to 75		70	115
76 to 85		80	130
86 to 95		90	145
96 to 105		100	160
Greater than 105		110	180

Distance between signs:
Single sign: 2D for speeds greater than 66 km/h and 1D for speed zones of less than 65 km

Multiple signs: 1D for all speed zones

EXISTING POSTED SPEED LIMIT: 50

PLAN SCALE: NTS

SHEET SIZE: A3

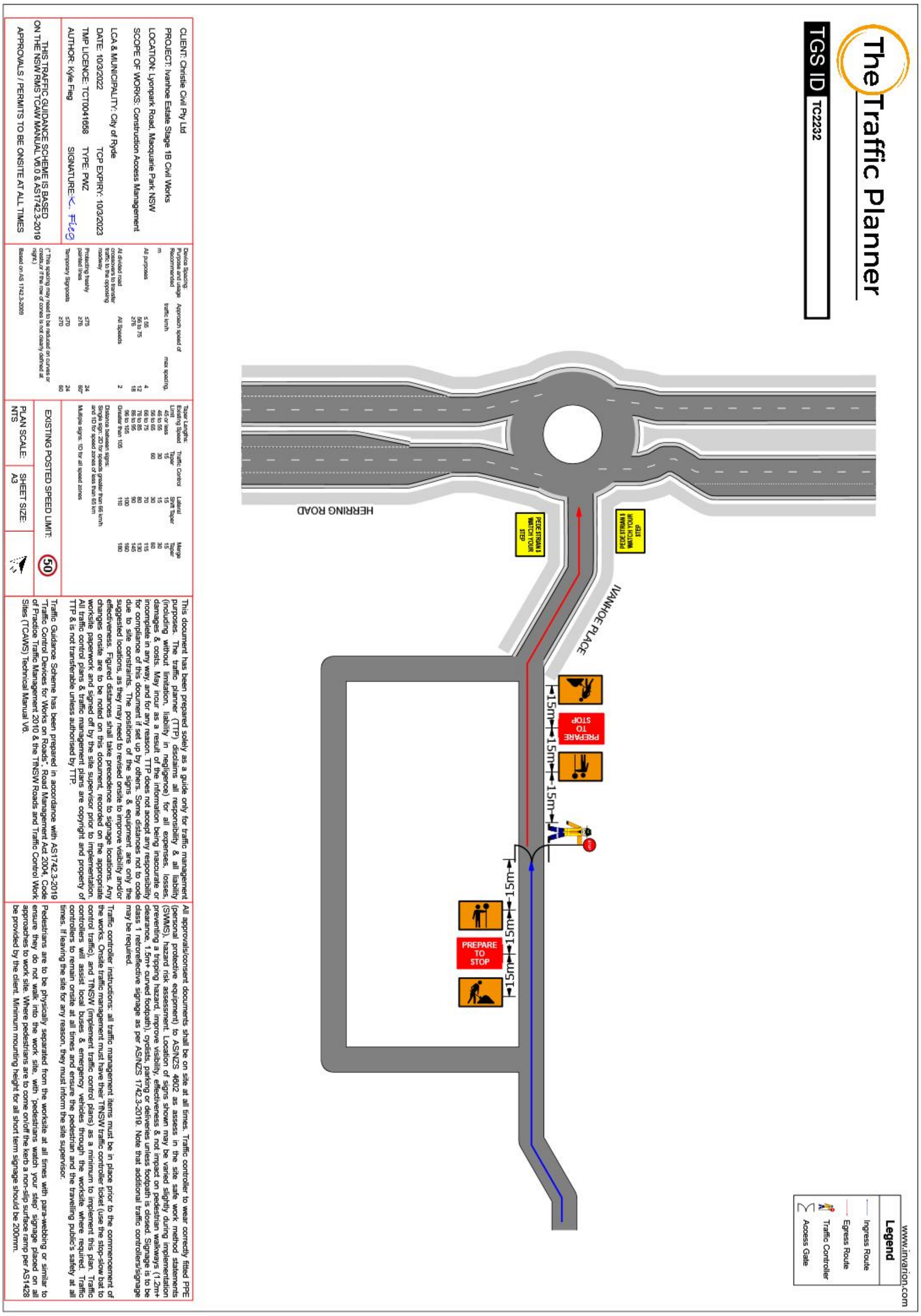
This document has been prepared solely as a guide only for traffic management purposes. The traffic planner (TTP) disclaims all responsibility & all liability (including without limitation, liability in negligence) for all expenses, losses, damages & costs. May incur as a result of the information being inaccurate or incomplete in any way, and for any reason. TTP does not accept any responsibility for compliance of this document if set up by others. Some distances not to code due to site constraints. The positions of the signs & equipment are only the suggested locations, as they may need to revised onsite to improve visibility and/or effectiveness. Figured distances shall take precedence to signage locations. Any changes onsite are to be noted on this document, recorded on the appropriate worksite paperwork and signed off by the site supervisor prior to implementation. All traffic control plans & traffic management plans are copyright and property of TTP & is not transferable unless authorised by TTP.

Traffic Guidance Scheme has been prepared in accordance with AS1742.3-2019 "Traffic Control Devices for Works on Roads", Road Management Act 2004, Code of Practice Traffic Management 2010 & the TfNSW Roads and Traffic Control Work Sites (TCAWS) Technical Manual V6.

All approvals/consent documents shall be on site at all times. Traffic controller to wear correctly fitted PPE (personal protective equipment) to AS/NZS 4602 as assess in the site safe work method statements (SWMS), hazard risk assessment. Location of signs shown may be varied slightly during implementation preventing a tripping hazard, improve visibility, effectiveness & not impact on pedestrian walkways (1.2m+ clearance, 1.5m+ curved footpath), cyclists, parking or deliveries unless footpath is closed. Signage is to be class 1 retroreflective signage as per AS/NZS 1742.3-2019. Note that additional traffic controllers/signage may be required.

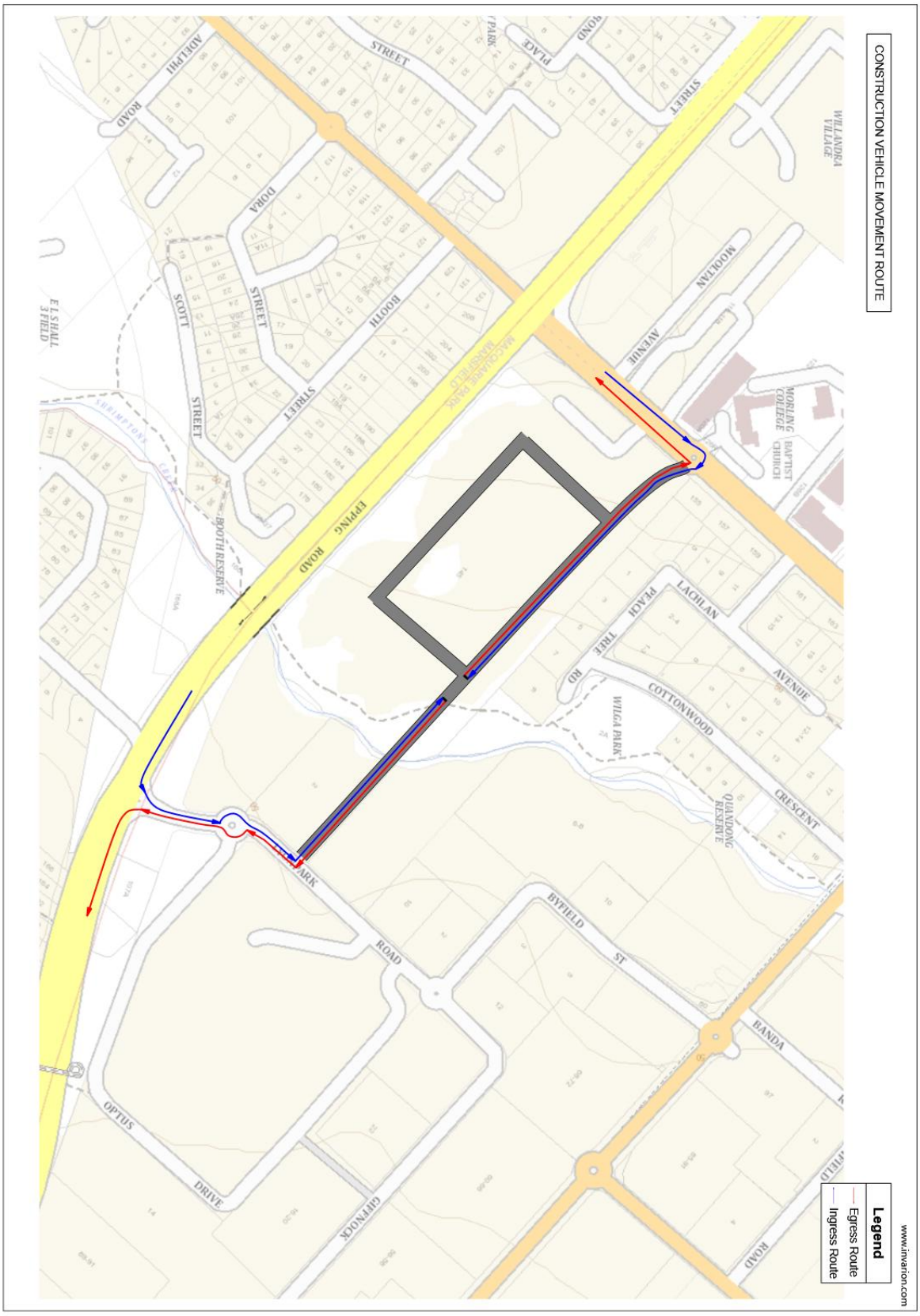
Traffic controller instructions: all traffic management items must be in place prior to the commencement of the works. Onsite traffic management must have their TfNSW traffic controller ticket (use the stop-slow bat to control traffic), and TfNSW (implement traffic control plans) as a minimum to implement this plan. Traffic controllers will assist local buses & emergency vehicles through the worksite where required. Traffic controllers to remain onsite at all times and ensure the pedestrian and the travelling public's safety at all times. If leaving the site for any reason, they must inform the site supervisor.

Pedestrians are to be physically separated from the worksite at all times with para-webbing or similar to ensure they do not walk into the work site, with 'pedestrians watch your step' signage placed on all approaches to work site. Where pedestrians are to come on/off the kerb a non-slip surface ramp per AS1428 be provided by the client. Minimum mounting height for all short term signage should be 200mm.


The Traffic Planner
TGS ID TC2232
HERRING ROAD
IVANHOE PLACE
PEDESTRIANS WATCH YOUR STEP
PREPARE TO STOP
15m
Legend
Ingress Route
Egress Route
Traffic Controller
Access Gate
www.invarion.com
CLIENT: Christie Civil Pty Ltd
PROJECT: Ivanhoe Estate Stage 1B Civil Works
LOCATION: Lyonpark Road, Macquarie Park NSW
SCOPE OF WORKS: Construction Access Management
LGA & MUNICIPALITY: City of Ryde
DATE: 10/3/2022 TCP EXPIRY: 10/3/2023
TMP LICENCE: TCT0041658 TYPE: PWZ
AUTHOR: Kyle Fieg SIGNATURE:
THIS TRAFFIC GUIDANCE SCHEME IS BASED ON THE NSW RMS TCAW MANUAL V6.0 & AS1742.3-2019
APPROVALS / PERMITS TO BE ONSITE AT ALL TIMES
EXISTING POSTED SPEED LIMIT:
50
PLAN SCALE: NTS
SHEET SIZE: A3

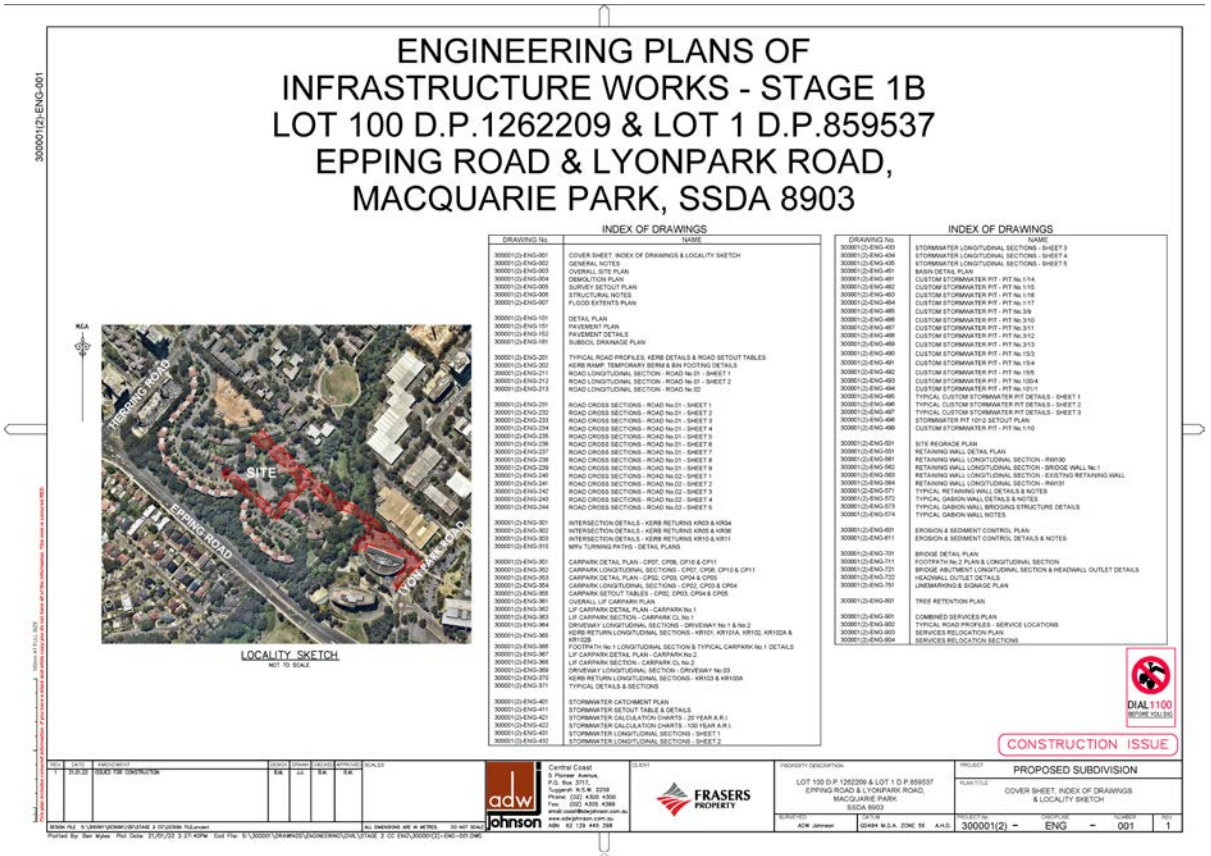
7. APPENDIX B – VEHICLE MOVEMENT ROUTES

SEE OVER PAGE


CONSTRUCTION VEHICLE MOVEMENT ROUTE
Legend
Egress Route
Ingress Route
www.invarion.com
EPPING ROAD
MACQUARIE PARK
BOOTH RESERVE
WILLANDRA VILLAGE
MOOLTAN AVENUE
MORLING COLLEGE
BAPTIST CHURCH
LACHLAN AVENUE
COTTONWOOD CRESCENT
WILGA PARK
QUANDONG RESERVE
BYFIELD ST
BANDA
OPTUS DRIVE
GIFFNOCK
SCOTT STREET
BOOTH STREET
DORA STREET
ADELPHI ROAD
ELSHALL SHED

8. APPENDIX C – PROJECT PLANS AND DIAGRAMS

SEE OVER PAGE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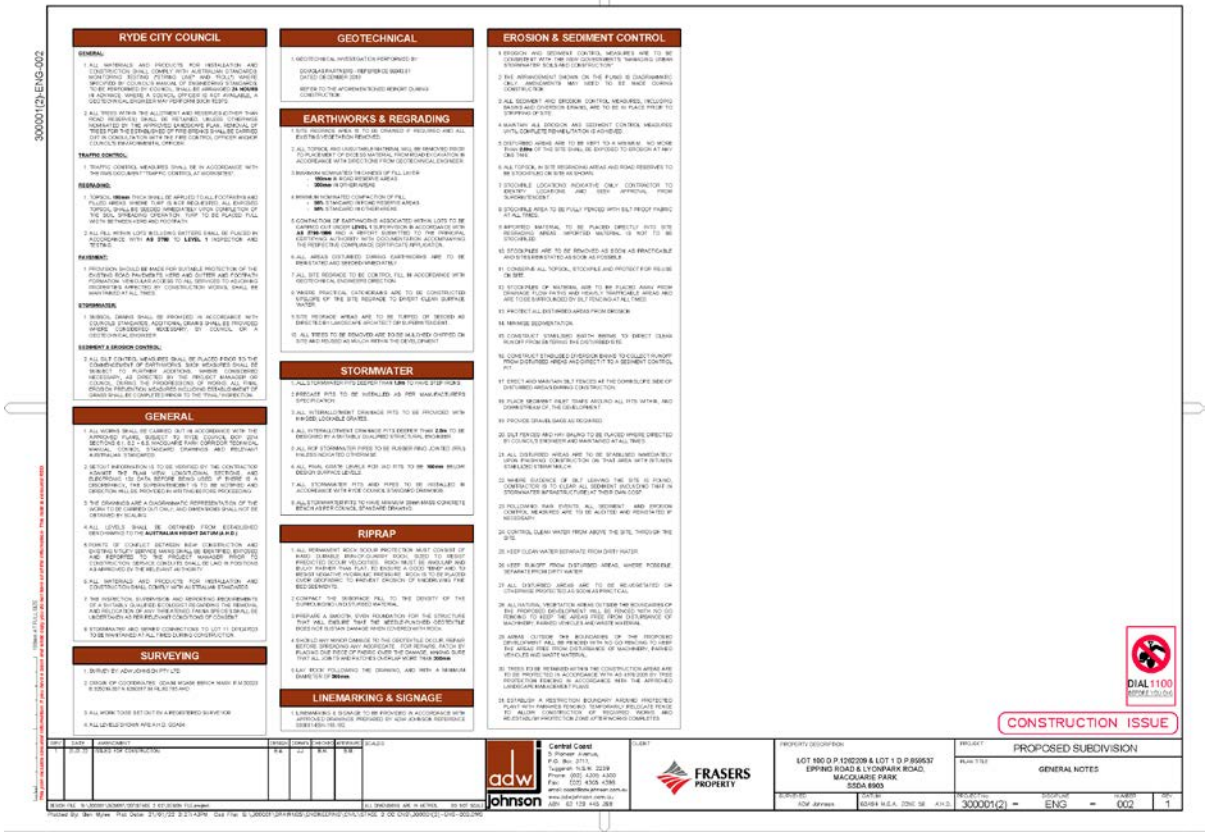
LOT 100 D.P.1262209 & LOT 1 D.P.859537
EPPING ROAD & LYONPARK ROAD,
MACQUARIE PARK, SSDA 8903
INDEX OF DRAWINGS
INDEX OF DRAWINGS
LOCALITY SKETCH
NOT TO SCALE
HERRING ROAD
EPPING ROAD
LYONPARK ROAD
SITE
DIAL 1100
BEFORE YOU DIG
CONSTRUCTION ISSUE
PROPOSED SUBDIVISION
COVER SHEET, INDEX OF DRAWINGS & LOCALITY SKETCH
FRASERS PROPERTY
adw johnson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REGRADING:
PAVEMENT:
STORMWATER:
SEDIMENT & EROSION CONTROL:
GEOTECHNICAL
EARTHWORKS & REGRADING
STORMWATER
RIPRAP
EROSION & SEDIMENT CONTROL
GENERAL
SURVEYING
LINEMARKING & SIGNAGE
DIAL 1100
BEFORE YOU DIG
CONSTRUCTION ISSUE
PROPOSED SUBDIVISION
GENERAL NOTES
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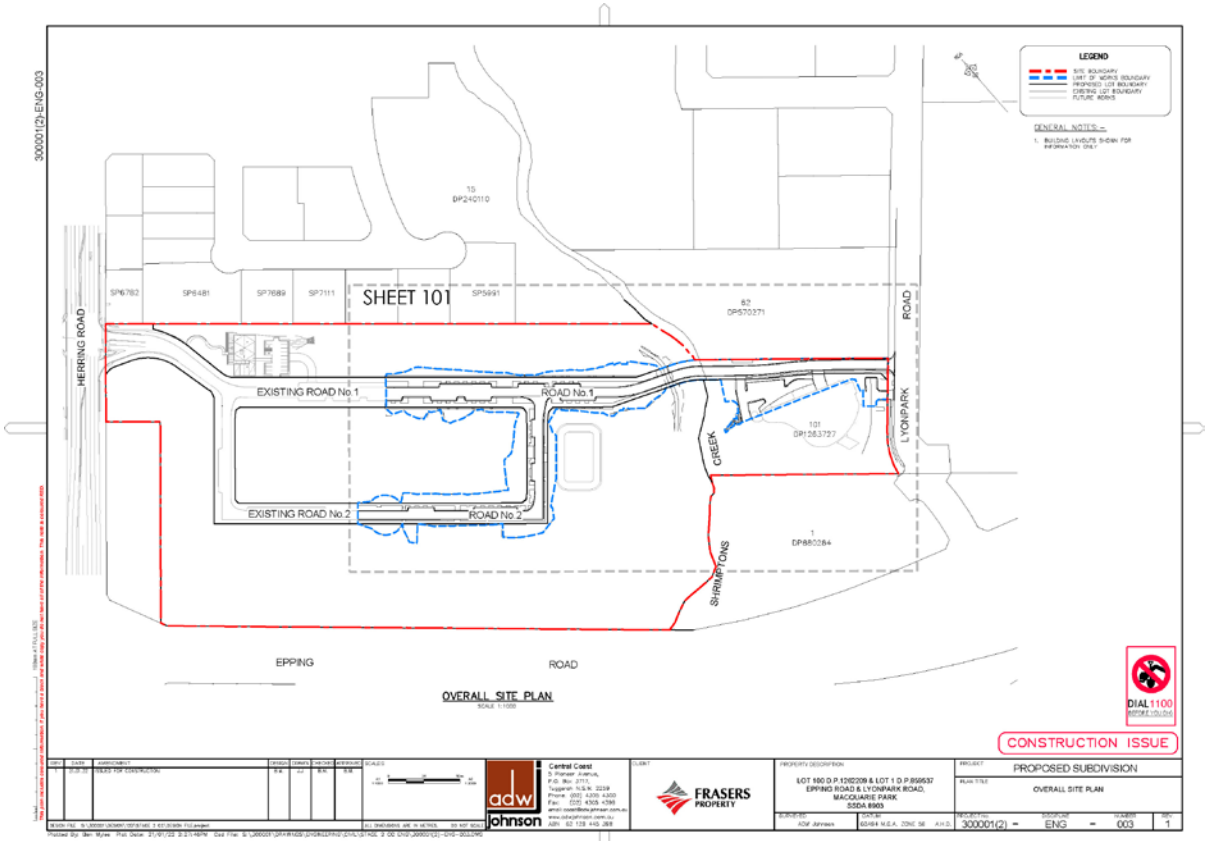
adw johnson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EXISTING ROAD No.1
ROAD No.1
EXISTING ROAD No.2
ROAD No.2
CREEK
LYONPARK ROAD
SHRIMPTONS
EPPING ROAD
OVERALL SITE PLAN
DIAL 1100
CONSTRUCTION ISSUE
PROPOSED SUBDIVISION
OVERALL SITE PLAN
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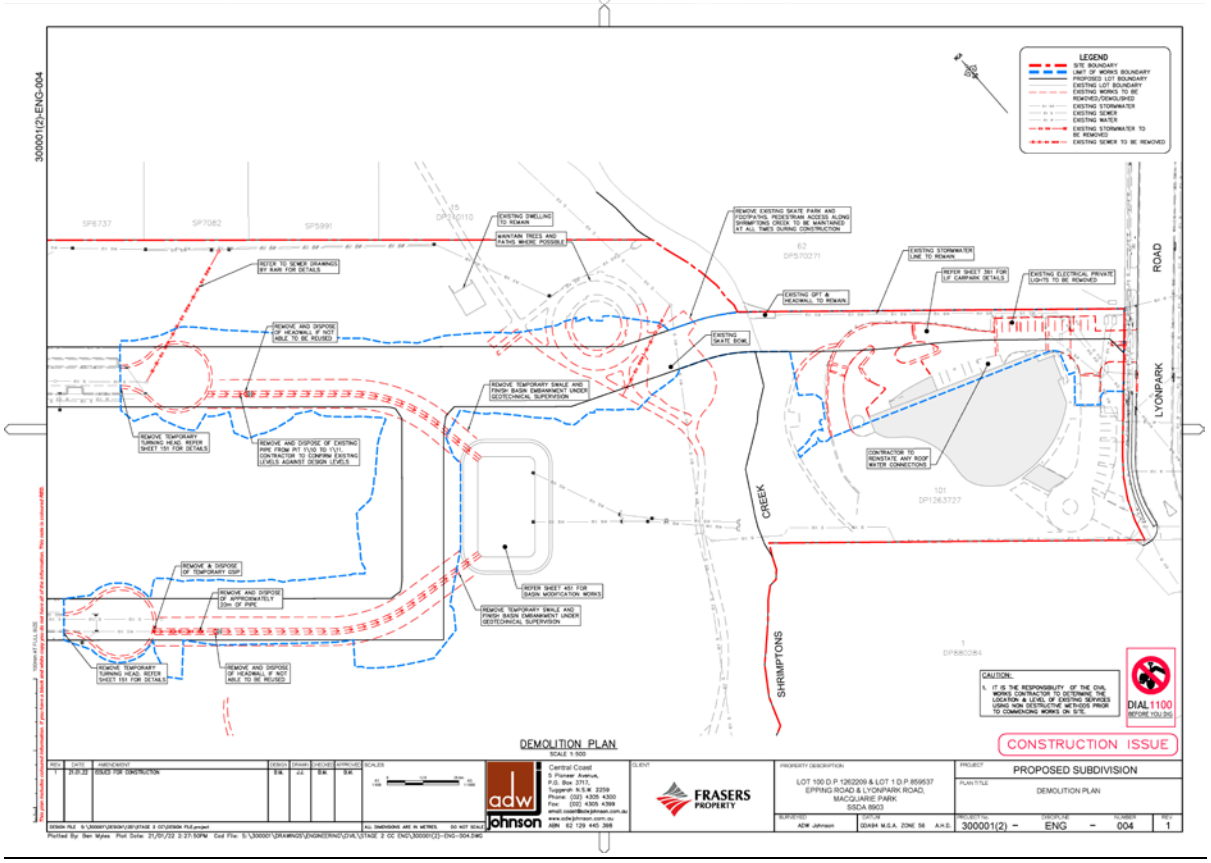
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LEGEND
EXISTING DWELLING TO REMAIN
MAINTAIN TREES AND PATHS WHERE POSSIBLE
REMOVE EXISTING SKATE PARK AND FOOTPATHS. PEDESTRIAN ACCESS ALONG SHRIMPTONS CREEK TO BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION
REFER TO SEWER DRAWINGS BY RARS FOR DETAILS
EXISTING STORMWATER LINE TO REMAIN
REFER SHEET 301 FOR CARPARK DETAILS
EXISTING ELECTRICAL PRIVATE LIGHTS TO BE REMOVED
EXISTING GPT & HEADWALL TO REMAIN
REMOVE AND DISPOSE OF HEADWALL IF NOT ABLE TO BE REUSED
EXISTING SKATE BOWL
REMOVE TEMPORARY SWALE AND FINISH BASIN EMBANKMENT UNDER GEOTECHNICAL SUPERVISION
REMOVE TEMPORARY TURNING HEAD. REFER SHEET 151 FOR DETAILS
REMOVE AND DISPOSE OF EXISTING PIPE FROM PIT 1100 TO 1101. CONTRACTOR TO CONFIRM EXISTING LEVELS AGAINST DESIGN LEVELS
CONTRACTOR TO REINSTATE ANY ROOF WATER CONNECTIONS
REMOVE & DISPOSE OF TEMPORARY GPT
REMOVE AND DISPOSE OF APPROXIMATELY 22m OF PIPE
REFER SHEET 451 FOR BASIN MODIFICATION WORKS
REMOVE TEMPORARY SWALE AND FINISH BASIN EMBANKMENT UNDER GEOTECHNICAL SUPERVISION
REMOVE TEMPORARY TURNING HEAD. REFER SHEET 151 FOR DETAILS
REMOVE AND DISPOSE OF HEADWALL IF NOT ABLE TO BE REUSED
CREEK
SHRIMPTONS
ROAD
LYONPARK
CAUTION:
DIAL 1100
CONSTRUCTION ISSUE
DEMOLITION PLAN
PROPOSED SUBDIVISION
DEMOLITION PLAN
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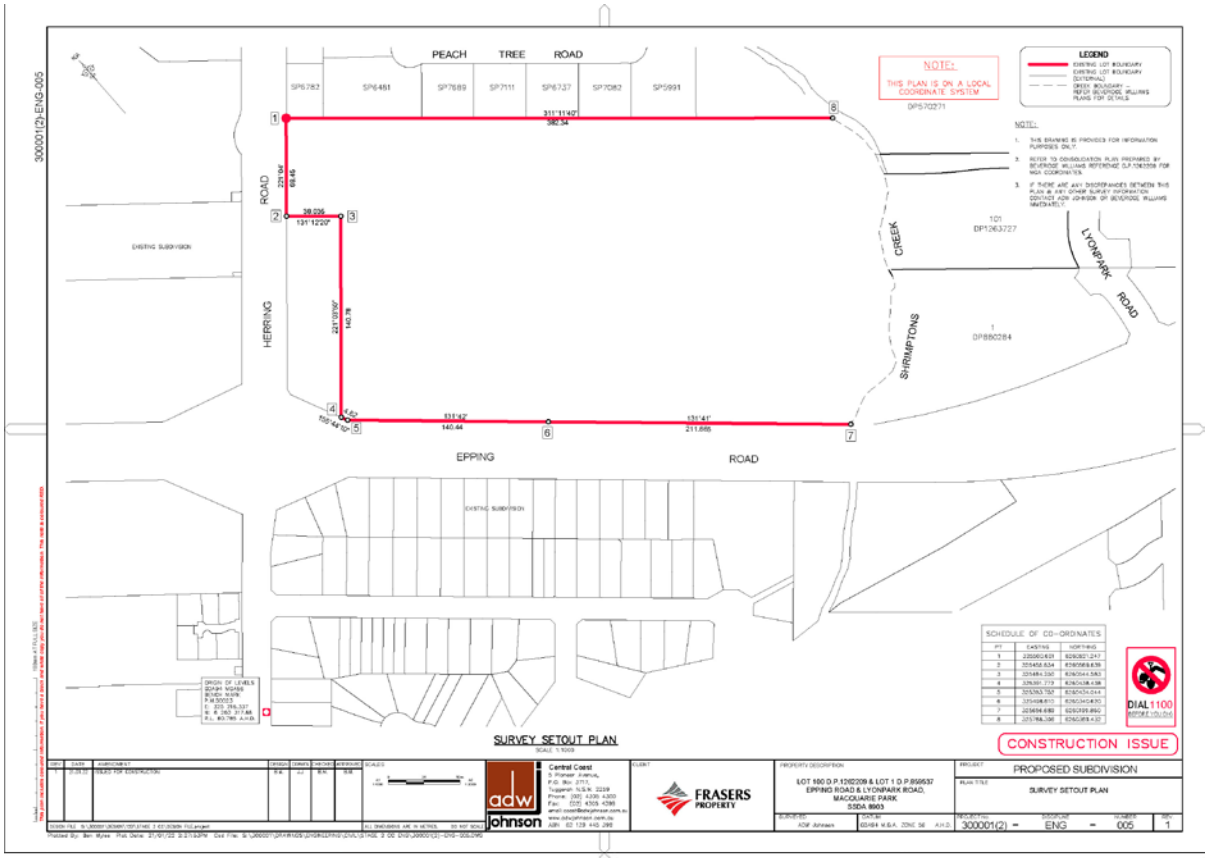
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HERRING ROAD
EPPING ROAD
LYONPARK ROAD
CREEK
SHRIMPTONS
NOTE:
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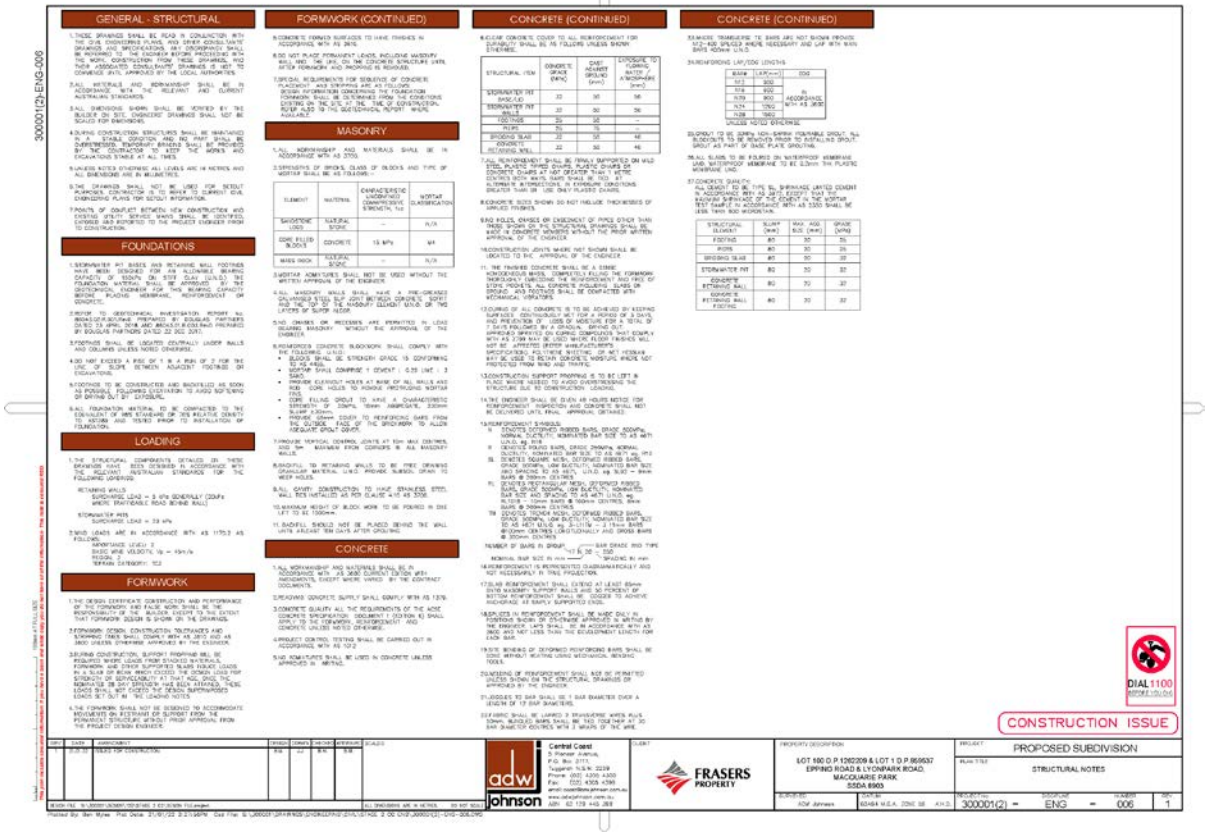
LEGEND
SCHEDULE OF CO-ORDINATES
SURVEY SETOUT PLAN
SCALE 1:1000
CONSTRUCTION ISSUE
PROPOSED SUBDIVISION
SURVEY SETOUT PLAN
LOT 160 D.P.1262209 & LOT 1 D.P.959537
EPPING ROAD & LYONPARK ROAD,
MACQUARIE PARK
SSDA 8903
DIAL 1100 BEFORE YOU DIG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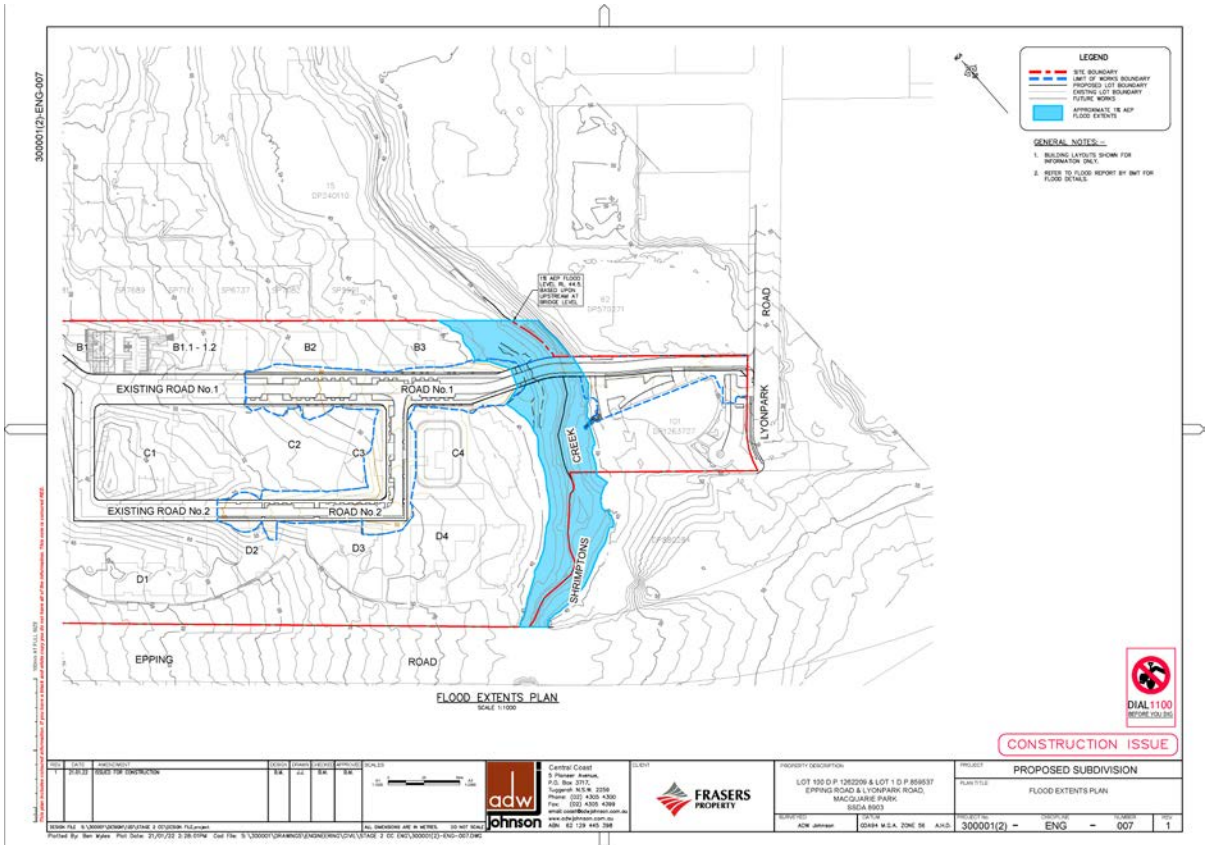
CONCRETE (CONTINUED)
CONCRETE (CONTINUED)
FOUNDATIONS
LOADING
FORMWORK
MASONRY
CONCRETE
CONSTRUCTION ISSUE
PROPOSED SUBDIVISION
STRUCTURAL NOTES
LOT 160 D.P.1262209 & LOT 1 D.P.959537
EPPING ROAD & LYONPARK ROAD,
MACQUARIE PARK
SSDA 8903
DIAL 1100 BEFORE YOU DIG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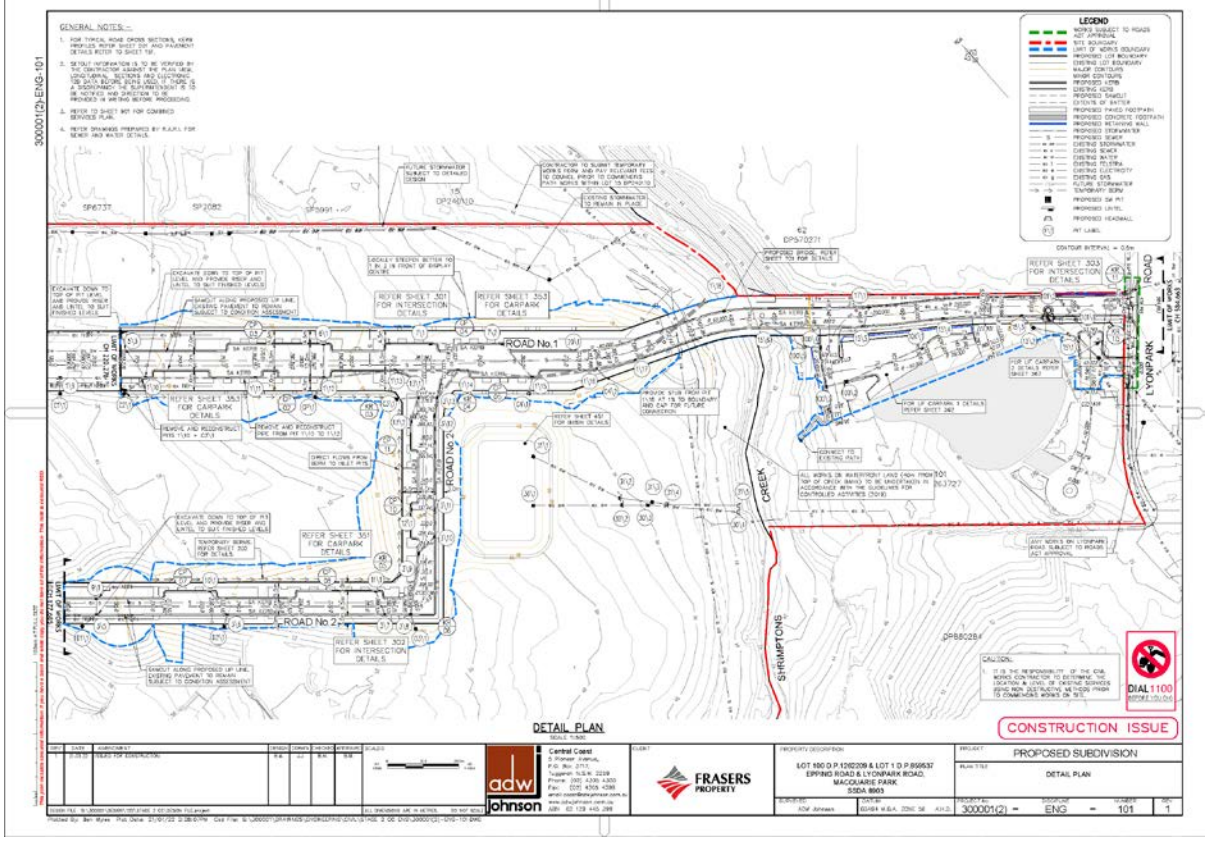
ROAD No.1
EXISTING ROAD No.2
ROAD No.2
B1
B1.1 - 1.2
B2
B3
C1
C2
C3
C4
D1
D2
D3
D4
CREEK
SHRIMPTONS
LYONPARK ROAD
EPPING ROAD
FLOOD EXTENTS PLAN
CONSTRUCTION ISSUE
PROPOSED SUBDIVISION
FLOOD EXTENTS PLAN
FRASERS PROPERTY
DIAL 1100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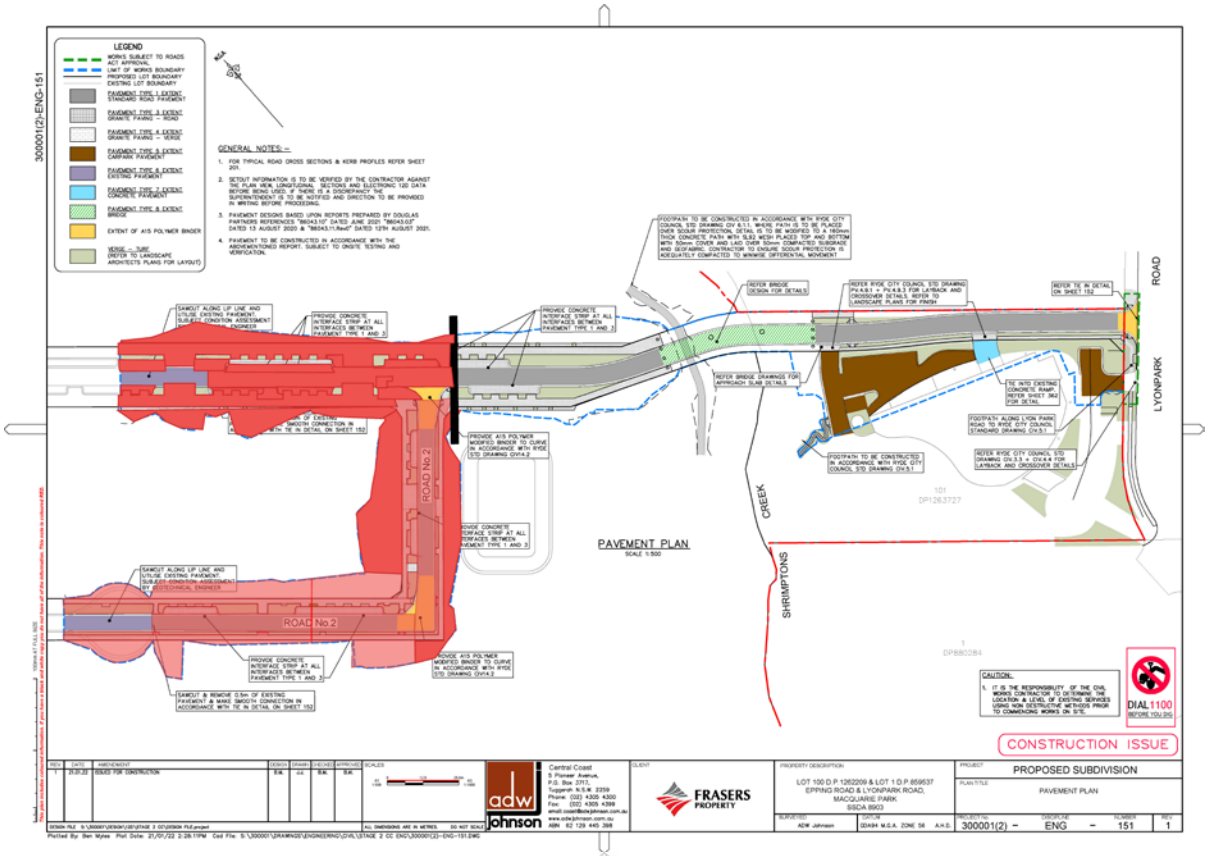
ROAD No.2
CREEK
SHRIMPTONS
LYONPARK ROAD
EPPING ROAD
DETAIL PLAN
CONSTRUCTION ISSUE
PROPOSED SUBDIVISION
DETAIL PLAN
FRASERS PROPERTY
DIAL 1100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SCALE 1:500
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SHRIMPTONS
LYONPARK ROAD
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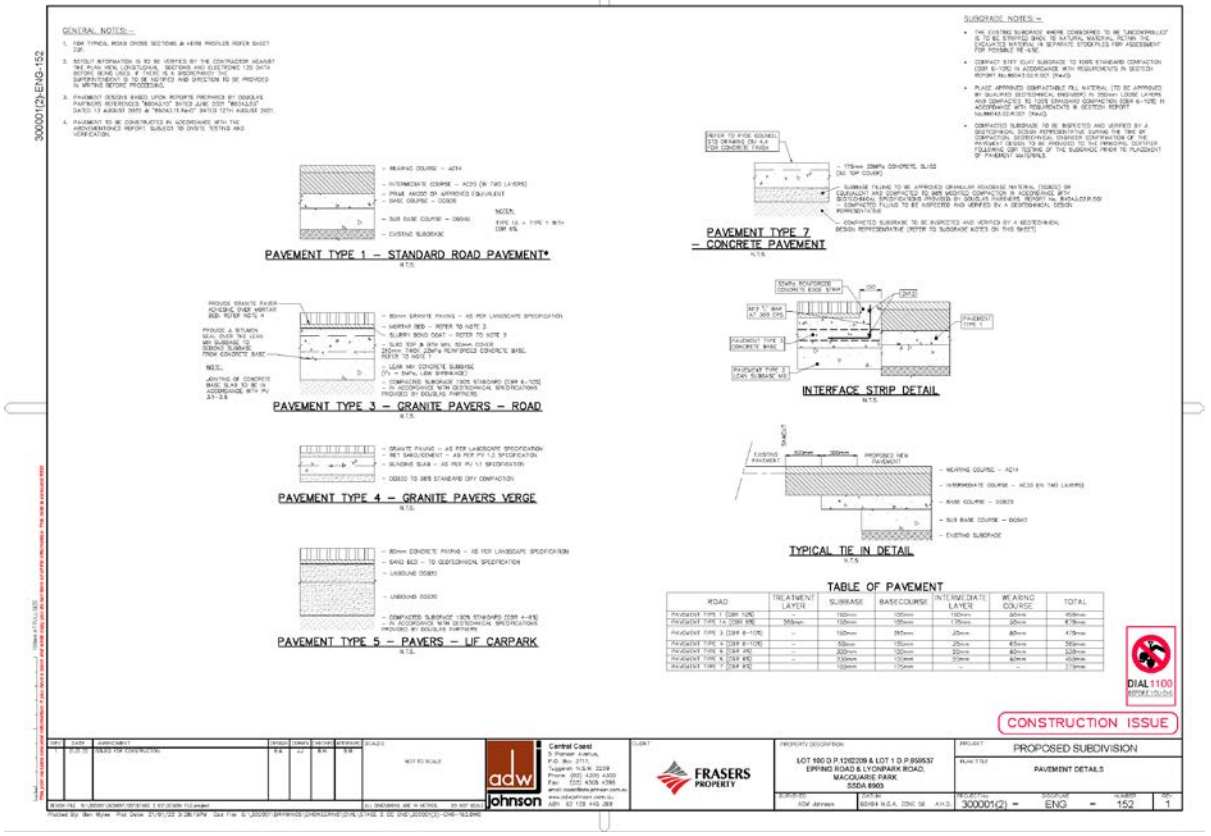
PROPOSED SUBDIVISION
PAVEMENT PLAN
FRASERS PROPERTY
DIAL 1100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SUBGRADE NOTES:-
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PAVEMENT TYPE 7 – CONCRETE PAVEMENT
PAVEMENT TYPE 3 – GRANITE PAVERS – ROAD
INTERFACE STRIP DETAIL
PAVEMENT TYPE 4 – GRANITE PAVERS VERGE
TYPICAL TIE IN DETAIL
PAVEMENT TYPE 5 – PAVERS – UF CARPARK
TABLE OF PAVEMENT
CONSTRUCTION ISSUE
PROPOSED SUBDIVISION
PAVEMENT DETAILS
FRASERS PROPERTY
DIAL 1100

APPENDIX 5

Construction Soil & water Management Plan CSWMP

Construction Soil & Water Management Plan
CSWMP

SSD 8903 Condition B45

Ivanhoe Estate
Stage 1B Civil Works
Epping & Lyonpark Roads
Macquarie Park
NSW 2113

Date: 3/03/22
Rev: B

CSWMP Template - Document Control + Change History

Document Controller	**Systems Manager**
Document Location	**Christie Civil server**
Document Name	**SOP 5.21 - Construction Soil & Waste Management Plan**

Issue / Revision	Date	Description of Revision	Approved by
A	10/01/20	Initial Issue	S Gormlie

Note:

- *All issues and revisions of this Template are reviewed and approved by the Systems Manager and Director/s*
- *This is a Christie Civil office server-controlled document – printed copies of this document are uncontrolled*

CSWMP - Document Control and Change History

Document Controller	**Project Manager**
Document Location	**Christie Civil office server**
Document Name	**CSWMP– Ivanhoe Estate – Stage 1B Civil Works**

All revisions of this Plan are implemented, reviewed and approved by the Project Manager.
The Project Manager is responsible for ensuring correct management of superseded versions and archiving on the Christie Civil server.

Revision	Date	Description of Revision	Created by	Approved by Project Manager	Approved by Construction Manager
A	**17/2/22**	Initial Issue - DRAFT	Michael Fitzgerald		
B	**3/03/22**	Updated based on comments from PCA	Simon Xin	Travis McCleary	Martin Carey

Contents

1. Introduction 4
1.1 Context 4
1.2 Background 4
2. ESCP No.1 – Separable Portion 1 – Road No. 1 & No. 2 6
2.1 Scope of Works 6
2.2 ESCP No. 1 – Road No.1 & No. 2 Works 6
2.2.1 Stabilised Site Access/Egress 8
2.2.2 Diversion of Upslope Water around Work Area 8
2.2.3 Sediment Fences & Ground Cover 10
2.2.4 Stockpiles 11
2.2.5 Redirecting Overland Flow from Undisturbed Areas 11
2.2.6 Stormwater Pits Inlet Protection 11
2.2.7 Dewatering 12
2.2.8 Sediment Basin 12
3. ESCP No. 2 – Separable Portion 2 – Shrimpton's Creek Bridge 13
3.1 Scope of Works 13
3.2 ESCP No. 2 – Shrimpton's Creek Bridge 13
3.2.1 Timing of Works 15
3.2.2 Isolation of Clean & Dirty Water 15
3.2.3 Ground Cover 15
3.2.4 Stockpiles 16
3.2.5 Sediment Basin 16
4.2.1 Dewatering Activities 16
4. ESCP No. 3 – Separable Portion 3 – LIF Building Works 16
4.3 Scope of Works 16
4.4 ESCP No. 3 – LIF Building Works 17
4.4.1 Sediment Fences and Ground Cover 19
4.4.2 Minimisation of Time and Extent of Disturbance 19
4.4.3 Stormwater Inlet Protection 19
4.4.4 Sediment Basin 20
4.4.5 Dewatering Activities 20
4.4.6 Stockpiles 20
5 ESCP No. 4 – Christie Civil Site Compound & Parking 20
5.2 Overview of Site Compound 20
5.3 Erosion & Sediment Controls 20
6 Inspection & Maintenance of Erosion & Sediment Controls 21
7 Appendix 22
7.1 Dewatering Permit 22
7.2 Daily & Weekly Site Checklists 25

1. Introduction

1.1 Context

This Construction Soil and Water Management Plan (CSWMP) is a Sub plan of the Construction Environmental Management Plan (CEMP) for the construction of Stage 1B of the Ivanhoe Estate development at Macquarie Park in Sydney. This CSWMP has been developed in accordance with the provisions of the *Blue Book Part 1 [Landcom (2004)] Managing Urban Stormwater: Soils and Construction, 4th edition].*

This CSWMP has be developed to satisfy the Consolidated Consent, MOD 3, SSD 8903 Condition B45.

1.2 Background

Frasers Property have awarded Christie Civil the Contract to complete Stage 1B Civil and bridge works to the Ivanhoe Estate project. The concept of Stage 1B is to construct an access road from Stage 1B through to Lyonpark Road. The works involve construction of a curved post tensioned bridge, road and drainage works, access and carpark works to an existing operation building.

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping and Herring Roads, within the Ryde Local Government Area (LGA) (see Figure 1-1 below). The site is approximately 8.2 hectares and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. An aerial photo of the site is provided at *Figure 1* below. Immediately to the north of the site are a series of four-storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot that is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment. Epping Road runs along the south-western boundary of the site and Shrimpton's Creek, an area of public open space, runs along the south-eastern boundary. Vehicle access to the site is via Herring and Lyonpark Roads. The Ivanhoe Masterplan site incorporates adjoining land, being a portion of Shrimpton's Creek and part of the commercial site at 2-4 Lyonpark Road. This land is included to facilitate a bridge crossing and road connection to Lyonpark Road.

Construction activities include:

- Dilapidation report
- Site clearing
- 10 Bored piles
- Form, reo, pour abutments, retaining walls, bridge piers
- Falsework to bridge deck
- Form, reo, pour bridge deck
- Post tensioning of bridge deck
- Steel handrails and bike guides
- Street and bridge lighting
- Gabion cladding
- Road construction including
    - Excavation
    - Place basecourse
    - Kerb and gutter
    - Asphalt
    - Linemarking
- Relocation of electrical kiosk
- Electrical works
- Services works
- Stormwater works including GPT
- Paving
- Landscaping

Figure 1 – Overview of Ivanhoe Estate Development

2. ESCP No.1 – Separable Portion 1 – Road No. 1 & No. 2

2.1 Scope of Works

The scope of Separable Portion 1 of the Ivanhoe Estate, Stage 1B Civil Works, involves the construction of Road No.1 and No.2, see plan view in Figure 2 below. Works involve, but are not limited to:

- Bulk and detailed earthworks for road/footpath subgrade and sub-base;
- Relocation of existing and installation of new in-ground services;
- Stormwater drainage lines & pits;
- Subsoil drainage;
- General concrete works;
- Asphaltic concrete;
- Footpath paving and;
- Landscape works.

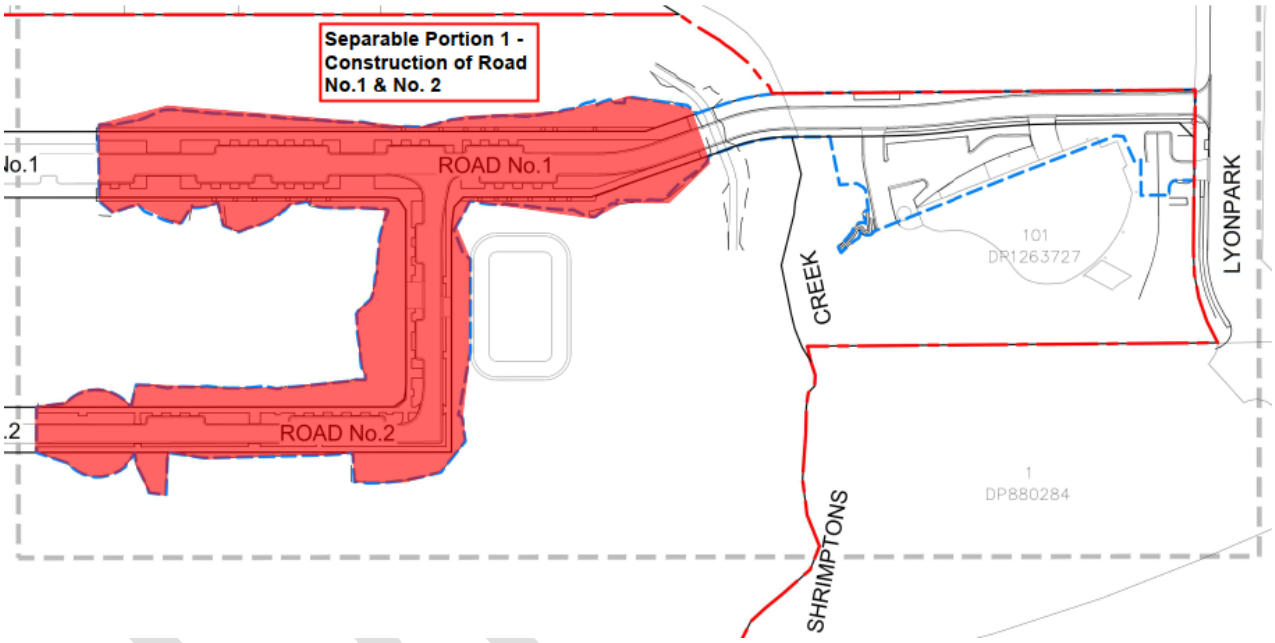
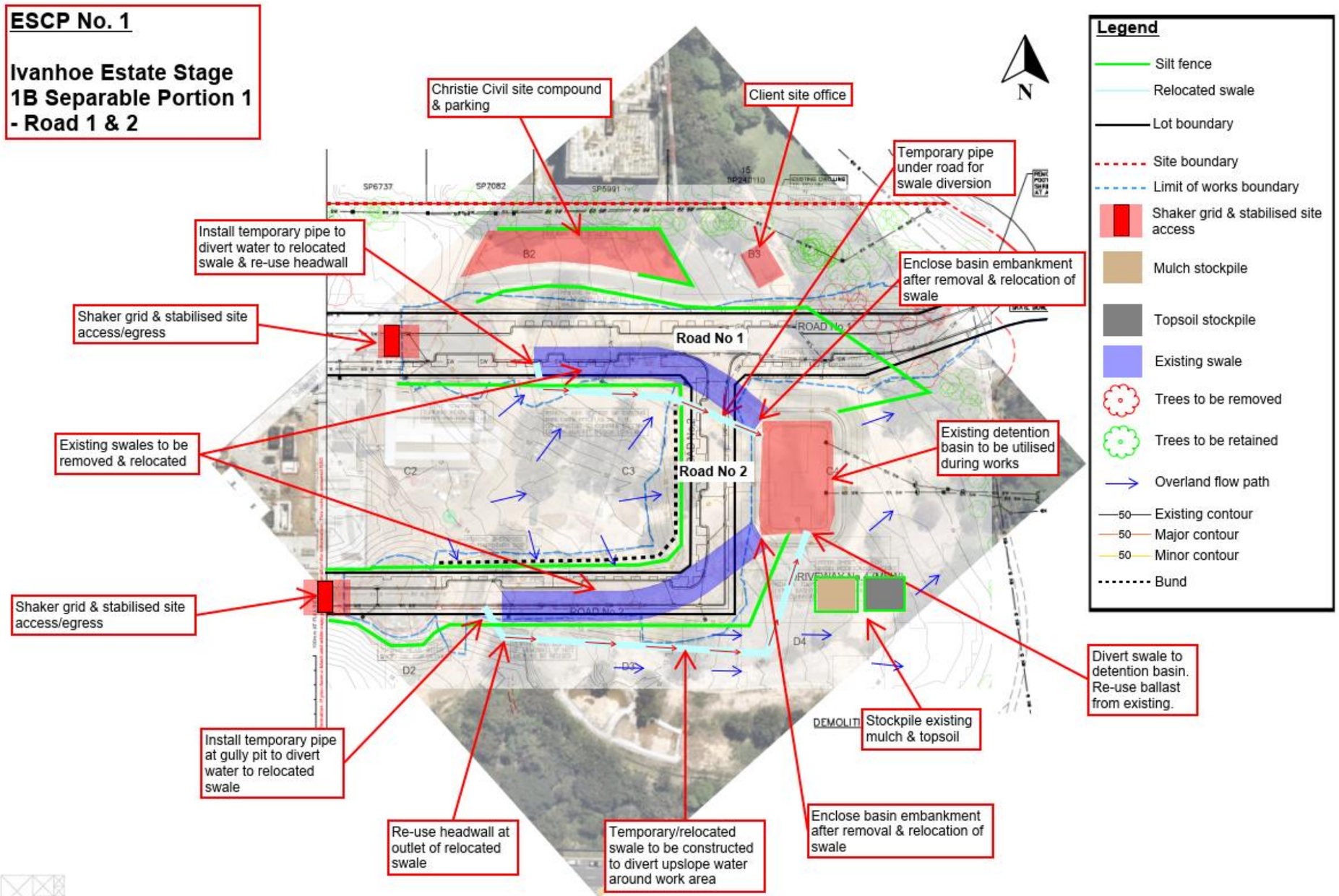


Figure 2 Plan View of Separable Portion 1 – Construction of Road No.1 & No.2

2.2 ESCP No. 1 – Road No.1 & No. 2 Works

The following erosion and sediment control plan, in Figure 3 below, has been developed for the construction of Road No.1 and No.2 as part of Separable Portion 1.

Figure 3 Erosion & Sediment Control Plan No. 1 – Separable Portion 1 – Road No.1 & No.2



2.2.1 Stabilised Site Access/Egress

As part of works involved in site establishment, stabilised site access/egress will be established to minimise sediment being tracked onto roads from construction vehicles. As shown in Figure 3 above, the stabilised site access/egress will be established at the interface of existing Road No.1/No.2 and new works area. Shaker grids will be installed at these locations. Existing pavement at the turning heads will be utilised as part of the stabilised entry points.

Where the existing pavement is removed due to construction staging of the works, the stabilised entry/exit area is to be constructed as per Figure 4 below.

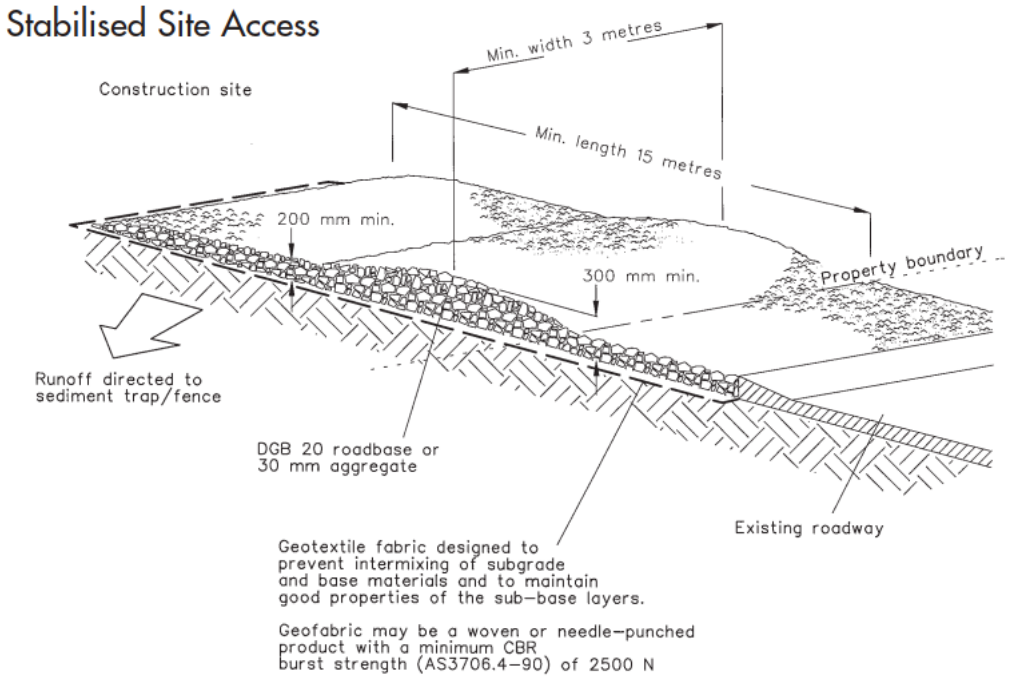


Figure 4 Stabilised Site Access/Egress

2.2.2 Diversion of Upslope Water around Work Area – Relocation of Existing Swales

Water from the existing catchment area, upslope of the work zone, is currently being diverted through the proposed location of Road No.1 and No.2 and into the detention basin; see Figure 3 ESCP No.1, above. Existing swales that have been established prior to the works will need to be removed and relocated, so that the upslope water is diverted around the work area and into the detention basin.

The existing swale that runs through Road No.2 South, will be relocated further South of the work area. The existing pipework is to be reused, where possible, to allow the flow to run under the proposed road construction along the alignment as shown in ESCP No. 1. The existing headwall is to also be reused at the outlet. The diversion channel will be lined with geofabric and incorporate check dams (see Figure 5 below); reusing the rock from the existing swale's check dams.

The outlet of this swale at the detention basin will be removed and basin wall enclosed. The outlet of the relocated swale will incorporate the existing rock to act as an energy dissipator to minimise erosion.

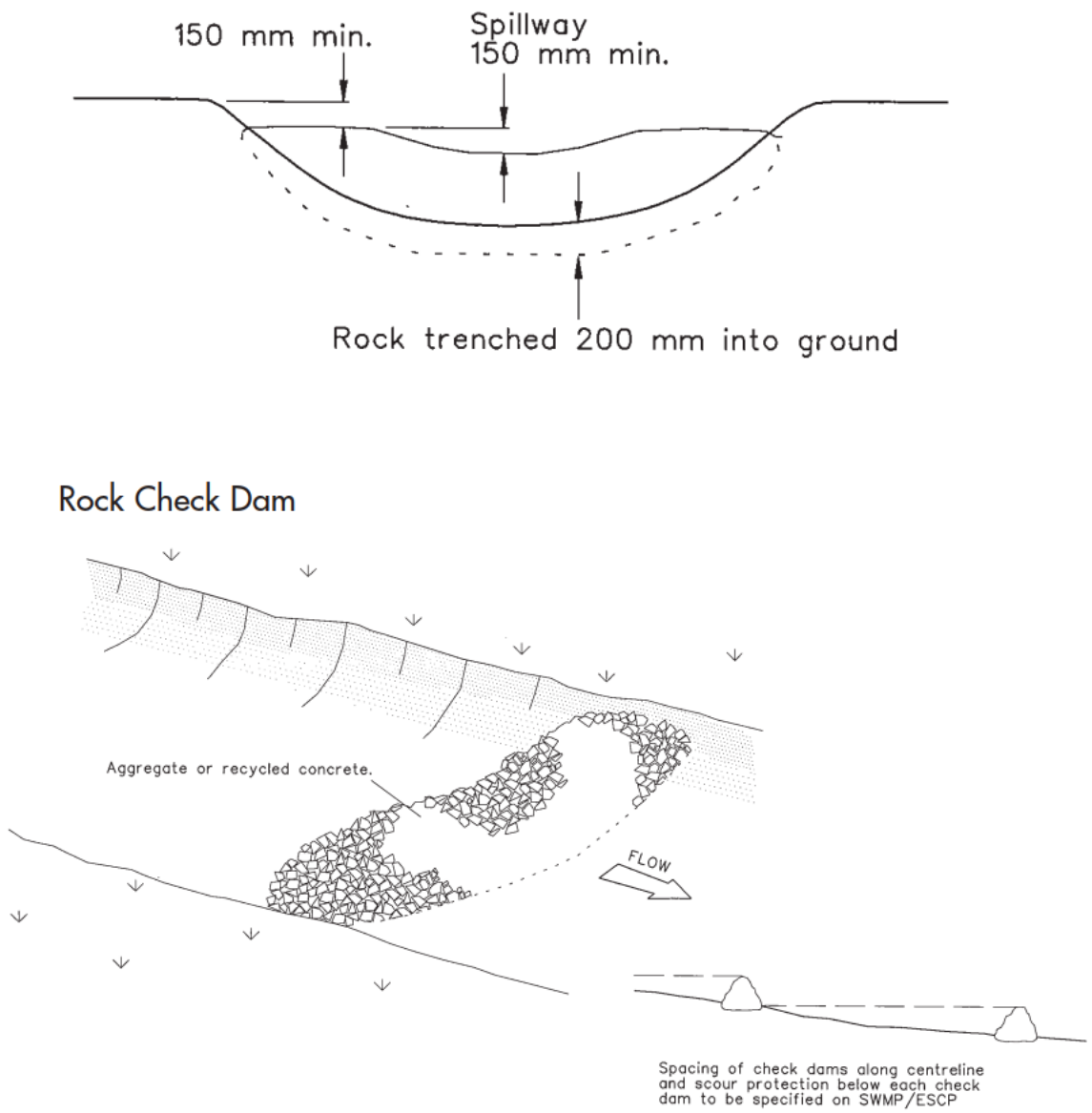


Figure 5 Check Dams for Channel Flow

In addition, similar diversion/relocation works will be required for the existing swale that runs along the alignment of Road No. 1. The existing pipework and headwall will be reused to redirect upslope water under and away from Road No. 1, to achieve the alignment shown in ESCP No. 1, above. However, the swale will also be required to run under a portion of Road No. 2 prior to discharging into the basin; as shown in ESCP No. 1, above. Existing pipework will be re-used to achieve this, or other PVC pipework to match similar diameter of existing.

2.2.3 Sediment Fences & Ground Cover

Sediment fences are to be established around the disturbed work areas to capture dirty run-off water. Generally, sediment fences are to be constructed at locations as per ESCP No. 1 or where sediment control is required to capture dirty water run-off from areas disturbed by the construction works. Sediment controls are to be installed as per Figure 6 below.

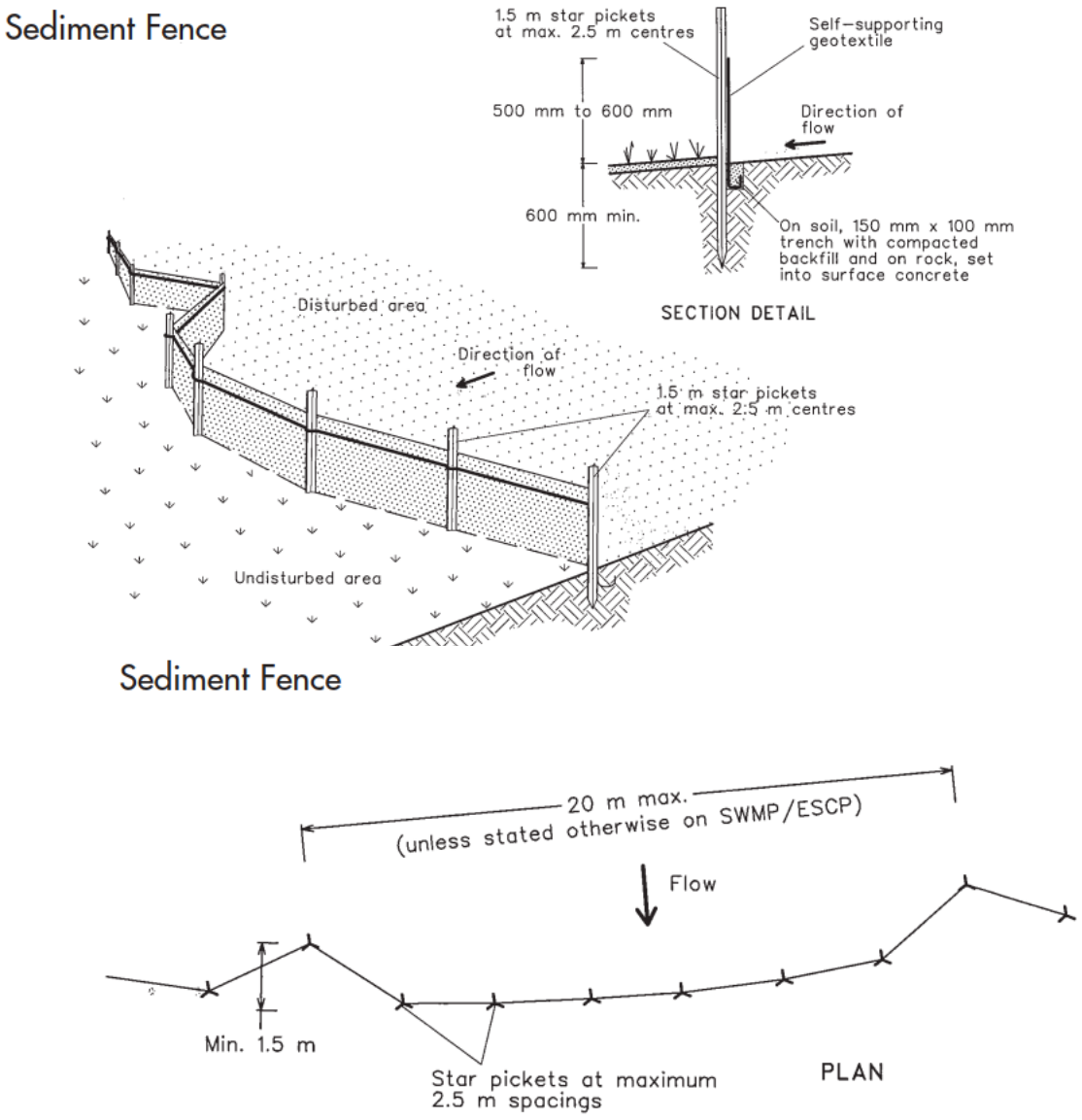


Figure 6 Sediment Fence Installation Drawing

Although not depicted on ESCP No. 1, ground cover, through the use of geofabric, is to be utilised where practicable during the course of the construction works. Ground cover should be established on steep or inactive disturbed work areas, specifically prior to rainfall.

2.2.4 Stockpiles

As part of the initial site establishment works, existing mulch South of Road No. 2, will be gathered and stockpiled in the general location, shown on ESCP No. 1, to enable construction works. In addition, all topsoil stripped as part of the clearing and grubbing works will also be stockpiled. Stockpiles are to have sediment controls installed as required, as shown in Figure 7, below.

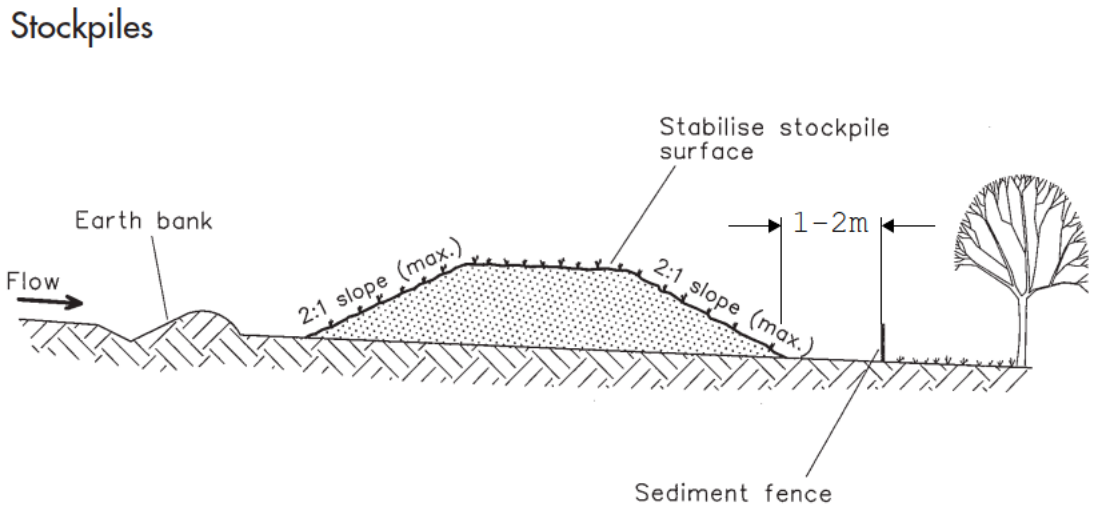


Figure 7 Stockpile Detail

2.2.5 Redirecting Overland Flow from Undisturbed Areas

The overland flow from the central vacant area between Road No. 1 and No. 2 currently flows in the direction of the work areas. The installation of an earth bund around the perimeter of Road No. 2 South, will capture and redirect the overland flow away from the work area and channel this into the relocated swale on the North, as shown in ESCP No. 1. Similar bunds may need to be created during the project as required to redirect sheet flow from undisturbed areas away from the disturbed work areas.

2.2.6 Stormwater Pits Inlet Protection

At a later stage, after the construction of the stormwater drainage pipes and pits, sediment entering these various pits will be controlled through measures shown in Figure 8, below.

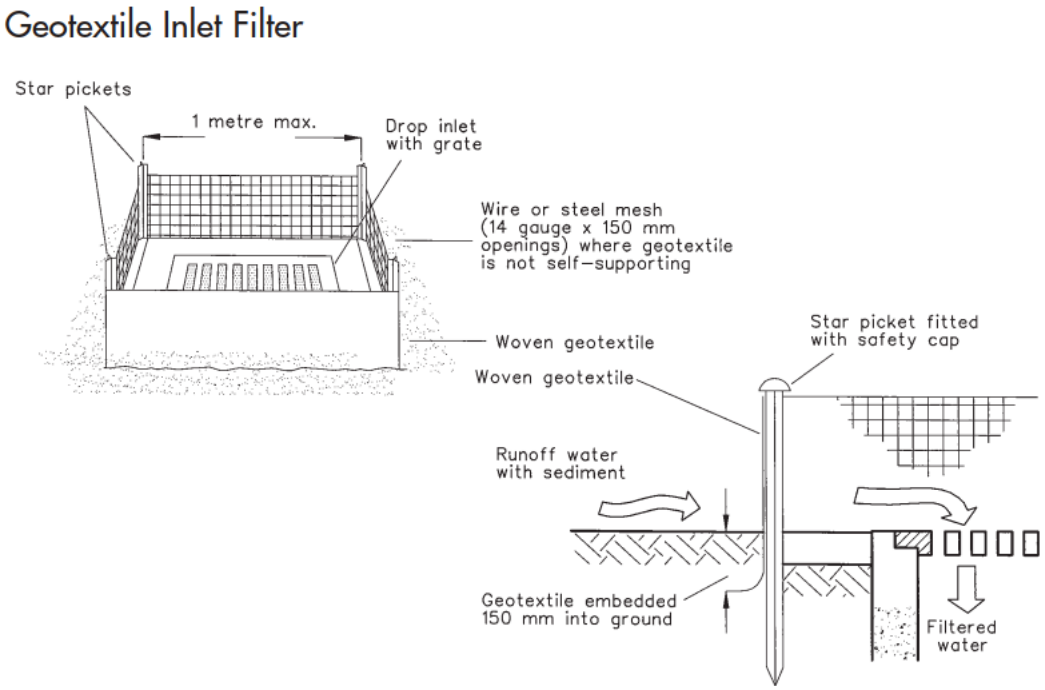


Figure 8 Drop Inlet Protection Measures for Stormwater Pits

2.2.7 Dewatering

Where excavations are required to be dewatered, a Dewatering Permit is to be completed prior and signed off by the site supervisor; see Appendix Section 7.1. All water that has achieved the required turbidity and pH levels, as required by the permit and per the Blue Book, is to be discharged into the sediment basin or stormwater pit or drain. Where required, dirty run-off water can be pumped back onto site, as long as it is captured by sediment fences and does not leave the site.
Excavation for trenches or pits should not be carried out if inclement weather is forecast. All excavations of this nature should be carried out in a timely manner and backfilled prior to rain events.

2.2.8 Sediment Basin

The existing sediment basin will be utilised throughout the course of the works involved in construction of Road No. 1 and No. 2. See Figure 3 above for location.
Details of the basin are as follows:

- Total minimum volume = 1065m3
- Base RL. = 47.0
- Max ponding level in 100YR = RL 47.54.

3. ESCP No. 2 – Separable Portion 2 – Shrimpton's Creek Bridge

3.1 Scope of Works

The scope of Separable Portion 2 of the Ivanhoe Estate, Stage 1B Civil Works, involves the construction of Shrimpton's Creek Bridge; see plan view in Figure 9 below. Works involved, but are not limited to:

- Clearing & grubbing;
- Piling & working platforms;
- Construction of bridge abutments;
- Construction of bridge piers;
- Construction of bridge retaining and wing-walls;
- Backfilling of abutments;
- Construction of bridge deck;
- Construction of bridge approach slabs;
- Installation of balustrades;
- Installation of services;
- Construction of scour protection and gabion retaining walls and;
- Miscellaneous works (signage & linemarking);

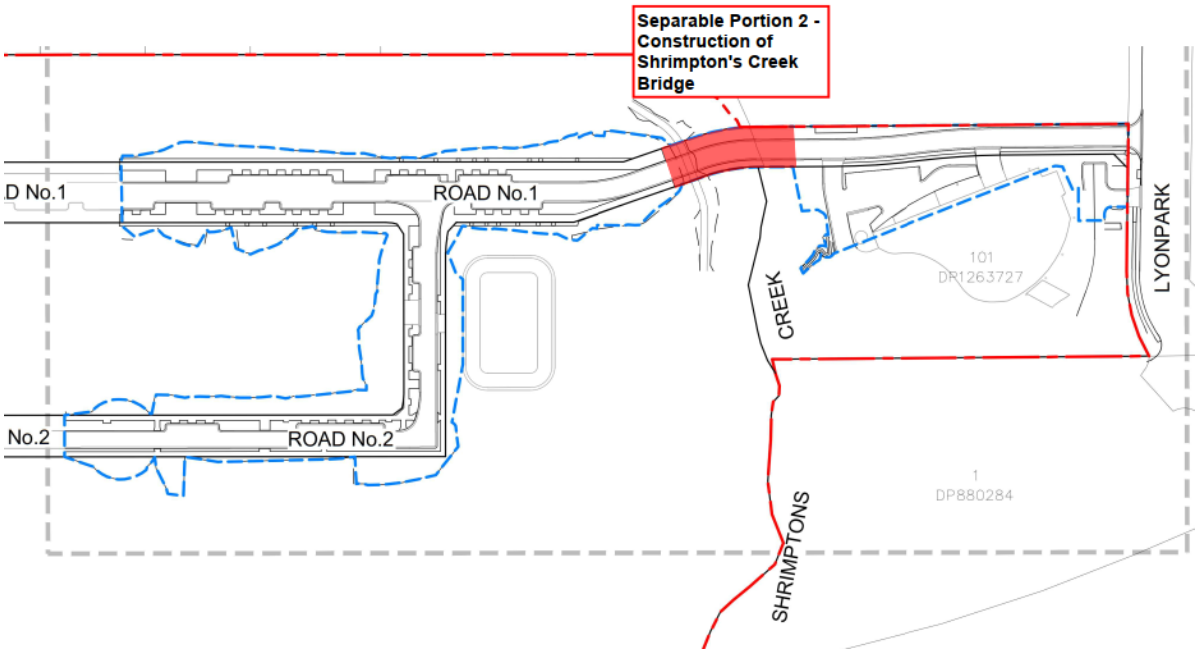


Figure 9 Separable Portion 2 – Construction of Shrimpton's Creek Bridge

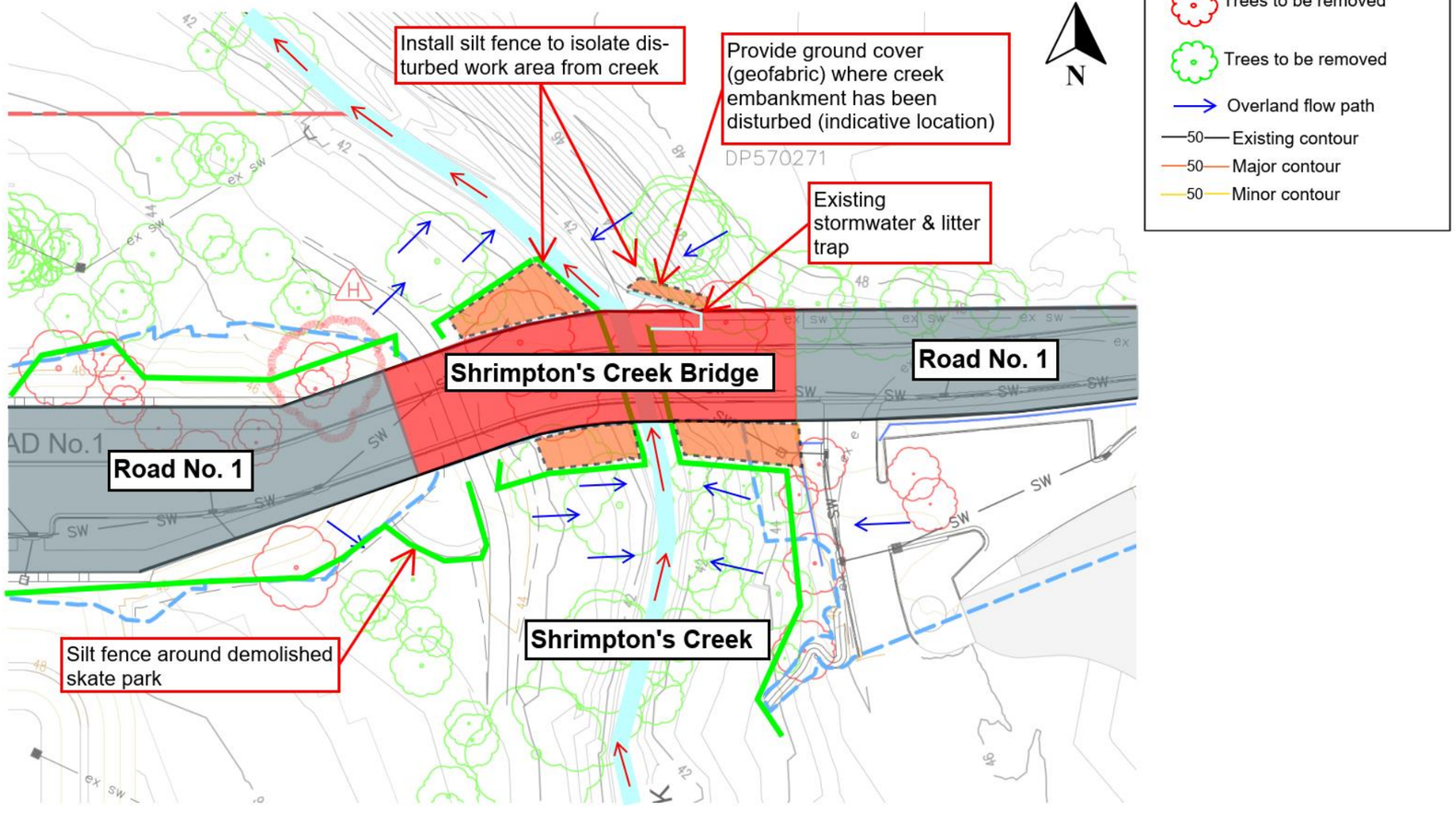
3.2 ESCP No. 2 – Shrimpton's Creek Bridge

The following erosion and sediment control plan, in Figure 10 below, is to be implemented for the construction works related to Shrimpton's Creek Bridge.
Due to the nature of the construction works taking place in, and in close proximity to, the creek, the ESCP control measures will focus on timing of the works, isolation of the work area and creek from clean and dirty water respectively and the use of ground cover.

Figure 10 ESCP No. 2 – Shrimpton's Creek Bridge

ESCP No. 2

Ivanhoe Estate Stage 1B Separable Portion 2 - Shrimpton's Creek Bridge



3.2.1 Timing of Works

To minimise the risk of sediment entering the creek, all works involved in the construction of the bridge are to be scheduled so that they can be carried out during periods of no rain and low creek flow. The Bureau of Meteorology is to be monitored if inclement weather is forecast. Refer to Section 6 for Ongoing inspection & Maintenance.

3.2.2 Isolation of Clean & Dirty Water

Clean and dirty water are to be isolated from the work and creek zones respectively.
Clean water run-off from undisturbed overland flow paths around the work zone, as shown in Figure 10 above, is to be directed away from the disturbed work zone. This is to be achieved through the use of, but not limited to, earth bunds, sediment fences, sand bags or other best management practices used by the site team to divert clean run-off around the work area. These controls are to be given a higher priority when inclement weather is forecast and should be established prior to rainfall events.
Dirty water generated from the disturbed work area is to be isolated from the creek and captured through the use of sediment fences. Sediment fences are to be installed along the lower portion of the creek, as shown in ESCP No. 2 in Figure 10 above. In addition, depending on the staging of construction works, additional sediment fences are to be installed around disturbed work areas where required to control sediment laden leaving the work site; see Figure 6 above for the installation of sediment fences.

3.2.3 Ground Cover

Ground cover should be utilised on steep or inactive areas of the bridge work zone. ESCP No. 2 above shows ground cover to be installed on the batters adjacent to the creek where existing vegetation and topsoil is stripped. Installation of ground cover should generally follow Figure 11, below. The weather forecast is to be monitored constantly during the project and where inclement weather is predicted, exposed areas of the site that are not shown on the ESCP in Figure 10, are to be protected with ground cover accordingly to control sediment and erosion.

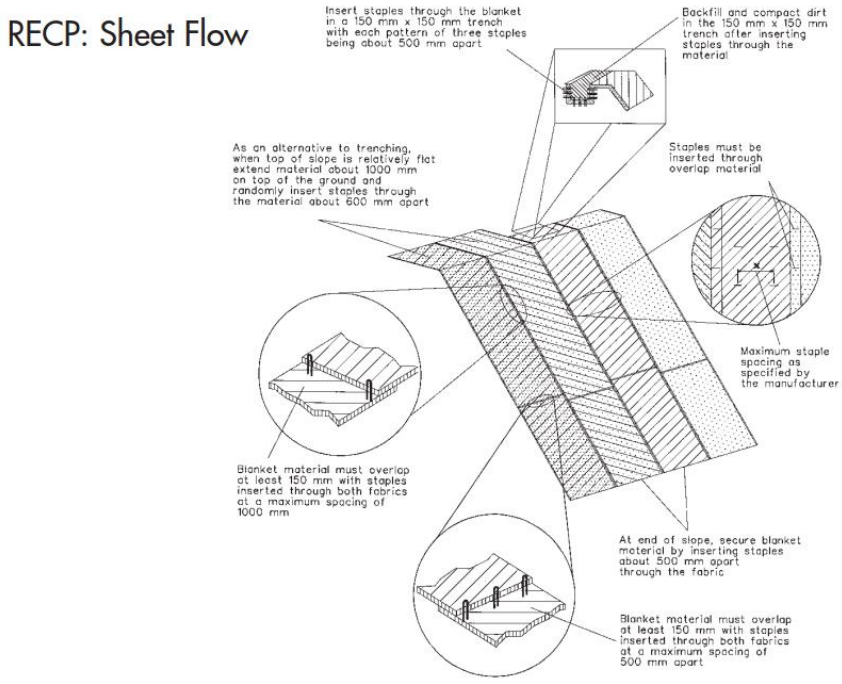


Figure 11 Installation of Ground Cover for Sheet Flow Erosion Protection

3.2.4 Stockpiles

All import fill material required for construction will be delivered to site as required for works on the day. Material requiring stockpiling, such as topsoil, will be placed within the Separable Portion 1 works area, as identified on ESCP No. 1.
If required during construction, material required to be stockpiled will be placed away from the creek works zone and correctly established with sediment and erosion controls consisting of sediment fences and ground cover.

3.2.5 Sediment Basin

It is not practicable to establish an additional sediment basin for the works for the Shrimpton's Creek Bridge due to site constraints. However, due to the relatively small disturbance of existing soil, all clean water run-off from around the site and dirty water from inside the work zone will be controlled as per ESCP No. 2 and the 3 main principles described in 3.2.1 to 3.2.3.

4.2.1 Dewatering Activities

No excavations for pits or trenches are to occur if inclement weather is forecast. Excavations are only to be carried out in dry conditions. Any ponded water that requires dewatering is only to be pumped if the Dewatering Permit (see 7.1) is completed and signed off by the site supervisor, with the water quality meeting turbidity and pH levels permitted by the permit. Moreover, if required, water can be pumped back onto the site, as per Blue Book, provided it is pumped so that it is captured by sediment barriers (i.e., sediment fences).

4. ESCP No. 3 – Separable Portion 3 – LIF Building Works

4.3 Scope of Works

The scope of Separable Portion 3 of the Ivanhoe Estate, Stage 1B Civil Works, involves the connection of Road No.1 to Lyonpark Rd and modifications to the LIF Building carpark; see plan view in Figure 12 below. Works involved, but are not limited to:

- Earthworks for road and carpark pavement;
- Excavation and installation for stormwater drainage pipes and pits, including GPT unit;
- Installation and relocation of in-ground services, including relocation of kiosks;
- Relocation of existing LIF Building driveway and construction of new;
- Construction of footpath and carpark paving and;
- Construction of new road connection to Lyonpark Rd;

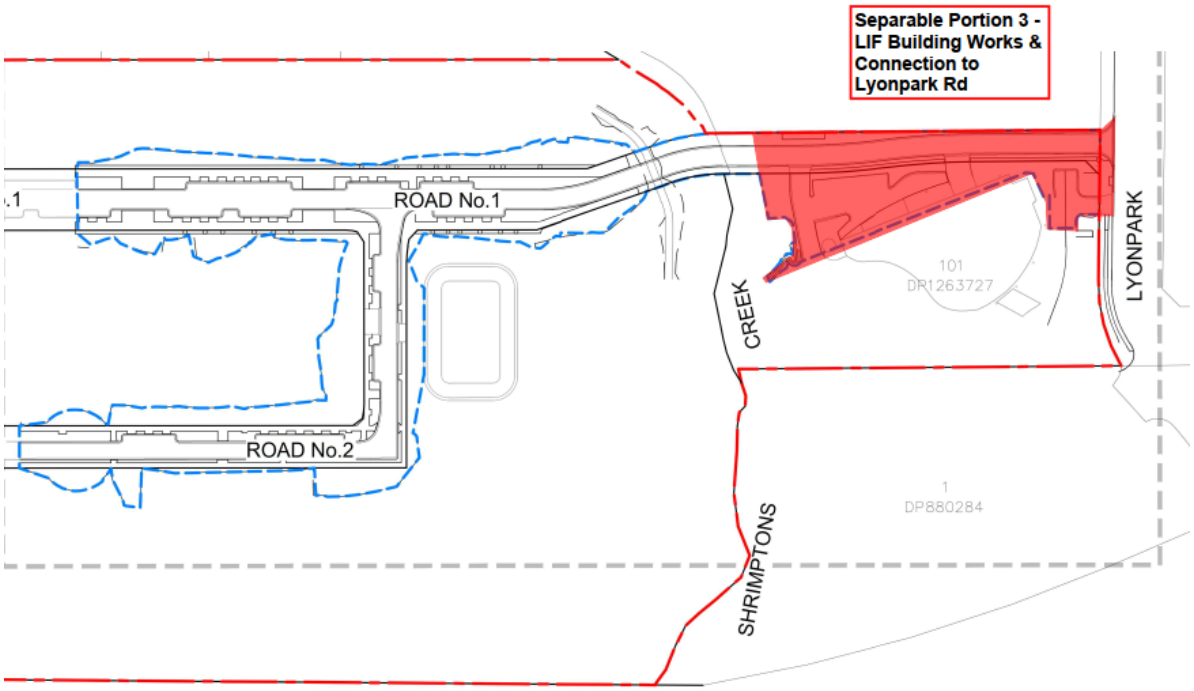
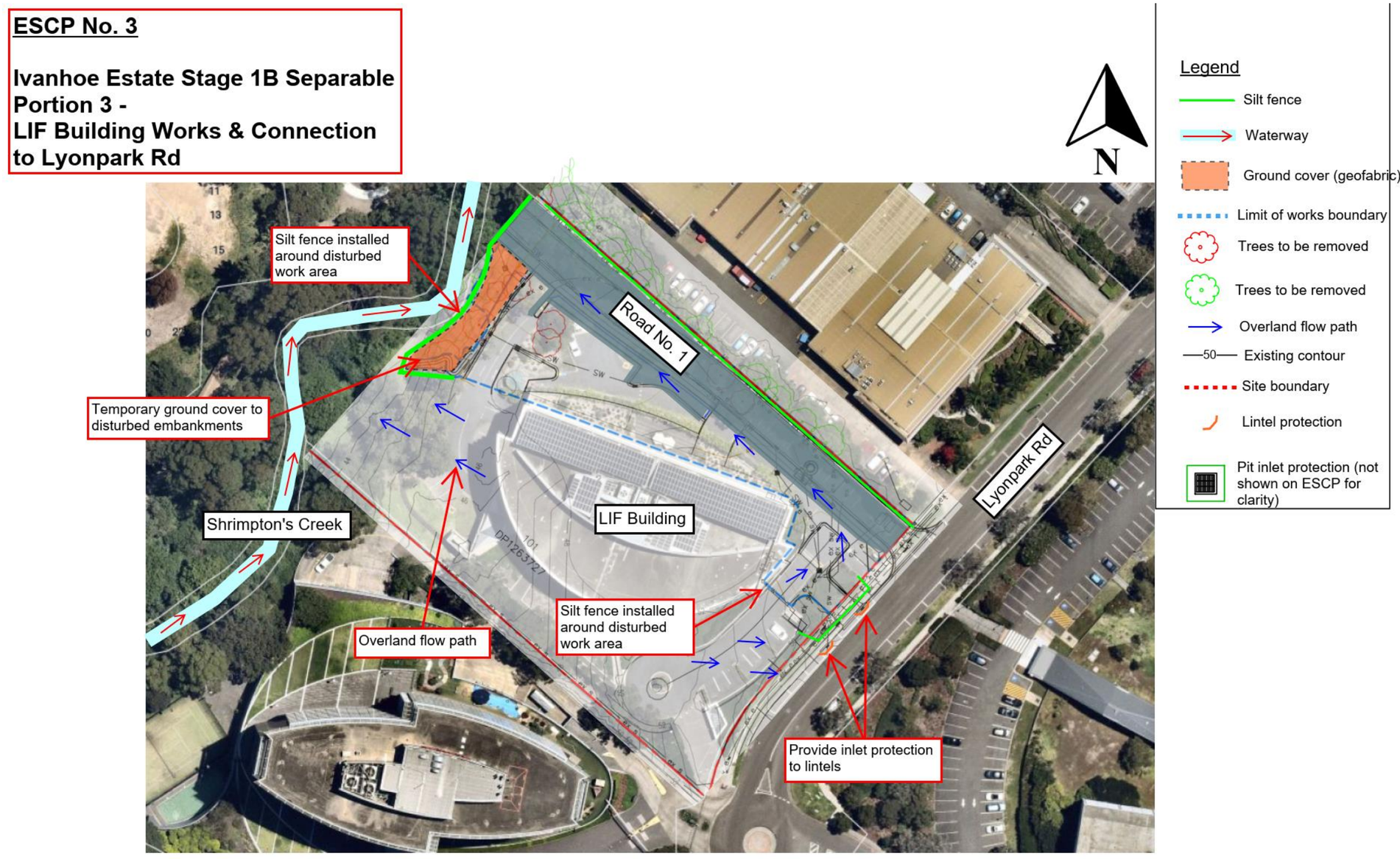


Figure 12 Plan View of Separable Portion 3 Works

4.4 ESCP No. 3 – LIF Building Works

The following erosion and sediment control plan, in Figure 13 below, is to be implemented for the construction works related to LIF Building and new road connection to Lyonpark Rd.
A significant constraint related to these works is that access into the LIF Building carpark is to be maintained at all times during the works. This will mean that the focus of erosion and sediment controls will be highly dependant on the construction staging of the works to ensure the above constraint is achieved throughout the project. Therefore, minimising the time and extent of disturbance will be a key principle that will govern best management practices to minimise and control the risk of sediment and erosion.

Figure 13 ESCP No. 3 – Separable Portion 3 – LIF Building Works & Road No.1 Connection to Lyonpark Rd



4.4.1 Sediment Fences and Ground Cover

Sediment fences are to be installed as per ESCP No. 3, shown in Figure 13, above. In general, sediment fences are to be installed in locations that are parallel with sheet flow from disturbed work areas. A sediment fence will be installed along the creek bank to capture any dirty water run-off from the LIF Building works zone. In addition, a sediment fence will also be installed in front of the existing crib wall to capture and divert clean water run-off from the adjacent carpark.
Ground cover will be utilised on the creek embankment that will be disturbed as park of the bridge and LIF Building works.
Additional sediment fences and ground cover measures are to be installed accordingly throughout each stage of the LIF building works, where practicable due to the requirement to maintain access into and out of the carpark.

4.4.2 Minimisation of Time and Extent of Disturbance

Due to the detailed staging of the LIF building works to maintain access into the carpark, the removal of hardstand and earthworks will by nature be minimal and controlled. All disturbed areas will be rehabilitated with the relevant hardstand material for pavement construction in a timely manner. The Bureau of Meteorology is to be monitored daily throughout the course of the project and when inclement weather is forecast, all disturbed areas are to be controlled through the use of best management practices or those described in Section 4.3.1 above. No works are to commence that disturb the existing hardstand or topsoil material if inclement weather is predicted.

4.4.3 Stormwater Inlet Protection

The construction works involve the installation of new stormwater pits. Where practicable, drop inlet protection measures are to be installed as per Figure 8 above. Existing stormwater pits on Lyonpark Rd are also to be protected using the inlet filter measures shown in Figure 14 below.

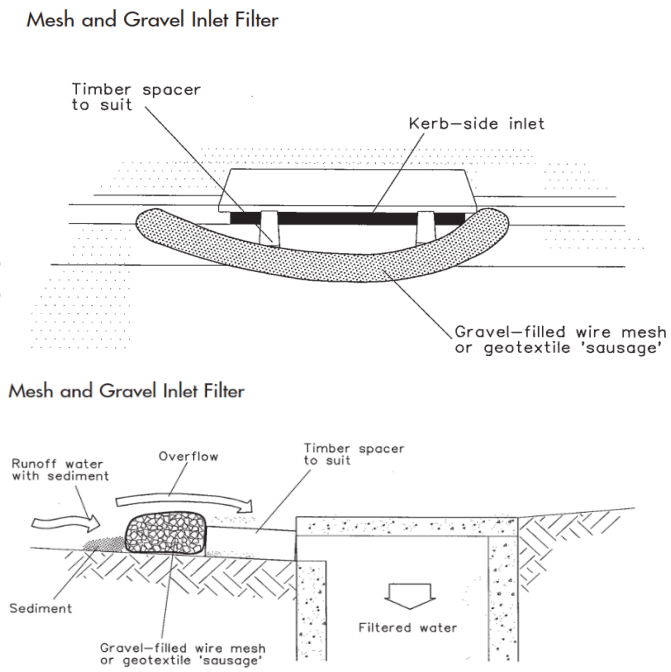


Figure 14 Inlet Filter Protection Measures

4.4.4 Sediment Basin

It is not practicable to establish an additional sediment basin for the works involved for the LIF Building due to site constraints and the requirement to maintain access for workers associated with the LIF Building. All works are to be carried out as required to maintain access for the LIF Building workers. The time and extent of disturbance, as mentioned in 4.3.2 above, will be minimal to ensure access is maintained. In addition, works involving the disturbance of existing hardstand pavement are not to be carried out if inclement weather / rain is forecast. All disturbed areas are to be rehabilitated in a timely manner as part of the staging involved to maintain access for the LIF Building workers. Where inclement weather is forecast, all exposed dirt is to be protected with ground cover and silt fences installed as required or detailed in the ESCP No.3.

4.4.5 Dewatering Activities

No excavations for pits or trenches are to occur if inclement weather is forecast. Excavations are only to be carried out in dry conditions. Any ponded water that requires dewatering is only to be pumped if the Dewatering Permit (see 7.1) is completed and signed off by the site supervisor with the water quality meeting turbidity and pH levels permitted by the permit. Moreover, if required, water can be pumped back onto the site, as per Blue Book, provided it is pumped so that it is captured by sediment barriers (i.e., sediment fences).

4.4.6 Stockpiles

All import fill material required for construction will be delivered to site as required for works on the day. Due to the site constrains, any material to be stockpiled will be done so in the Separable Portion 1 area. Sediment and erosion controls are to be installed accordingly.

5 ESCP No. 4 – Christie Civil Site Compound & Parking

5.2 Overview of Site Compound

The site compound is to be established on the vacant land North/East of the Client's site office, as shown in Figure 15 below. The site compound will consist of the following, but not limited to:

- Ablution block;
- Site office;
- Change room;
- Lunch room;
- Site parking;
- Site storage container;
- Fuel and hazardous material storage cages and;
- Site compound generator (if mains supply is not available).

5.3 Erosion & Sediment Controls

Prior to the establishment of the site compound, the proposed site parking is to be stabilised with rock, DGB-20 or other material.
The upslope overland flow paths currently scour the proposed site location. To eliminate this, a barrier is to be established on the upper North side of the compound to divert these flows away and to the existing swale near the site hoarding, as shown in Figure 15, below.

Additional sediment fences are to be established at the rear of the site compound to capture any run-off from the site compound.

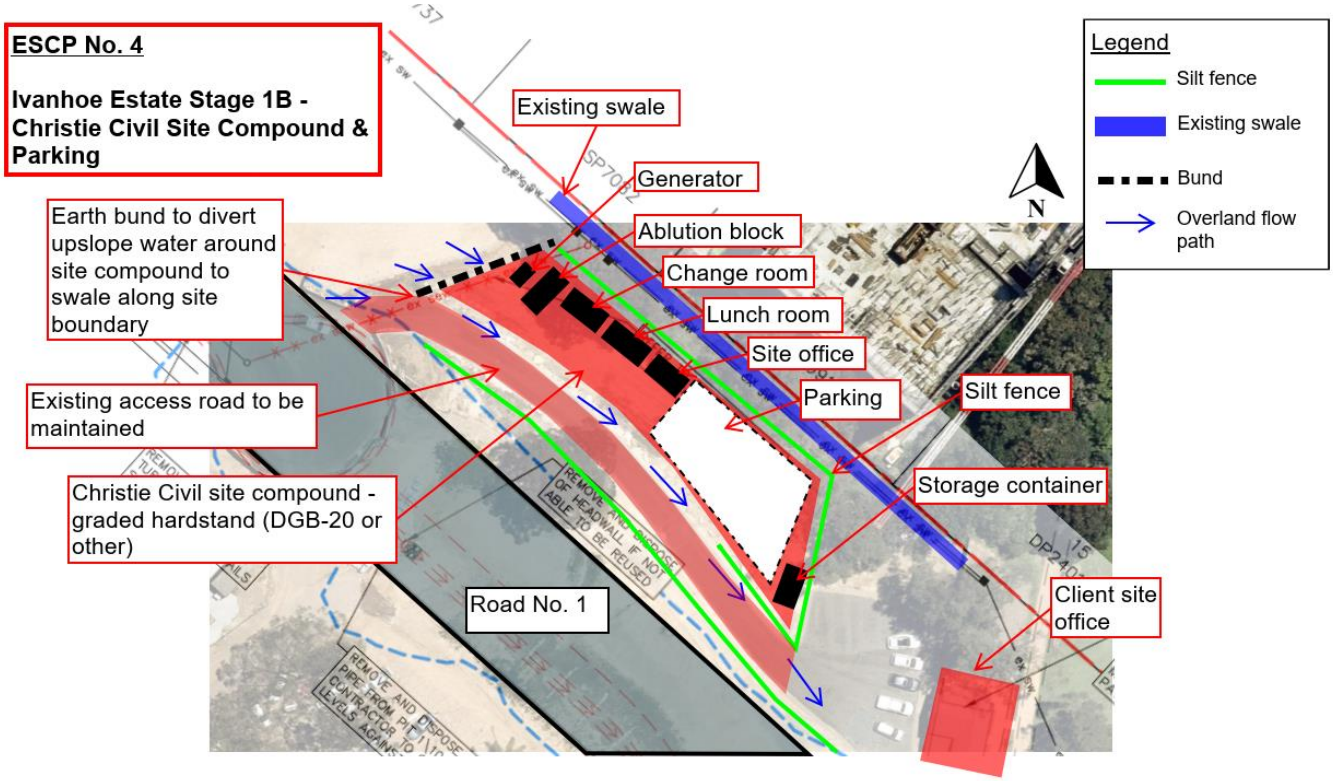


Figure 15 ESCP No. 4 – Christie Civil Site Compound & Parking

6 Inspection & Maintenance of Erosion & Sediment Controls

Through the course of the project, inspection and maintenance of erosion and sediment controls will be undertaken on a regular basis to ensure the controls are performing as expected. This will be achieved through the following:

- Daily & Weekly Site Inspections (see Appendix Section 7.2);
- Daily monitoring of the Bureau of Meteorology and, if inclement weather is forecast, a pre-rain inspection will be conducted to ensure all erosion and sediment controls are implemented or where they require repairing;
- Inspection of erosion and sediment controls post rain event and repair and cleaning of controls as required and;
- Review and amendment of ESCP plans if deemed ineffective during rain events

7 Appendix

7.1 Dewatering Permit

SSPF38
De-watering Permit
11/06//21
Rev:A

De-watering Permit

SUPERVISOR DETAILS					
Full Name:		**Signature:**		**Date:**	
Location requiring de-watering:					

Dewatering Layout Plan:	
Issues / Risks: - The Conduit in which groundwater is pumped interfering with work-areas. - Pumping of water from excavation, potentially producing noxious gases - Contaminated water being pumped into neighbouring creek	**Controls:** - A lay-flat hose will be positioned clear of work area and excavator. - The pump motor will be placed on the outside of the excavation, in open space. - Test water prior to discharging, and visually observe water quality. - Water to be flocculated prior to pumping if required. - Filter socks to be installed on pump outlets.

Page **1** of **3**

SSPF38
De-watering Permit
11/06//21
Rev:A

De-watering Permit

Permission to De-water					
Discharge to:					
Land		**Location:**			
Water		**Location:**			
Waste Facility		**Location:**			
Date:		**Time:**		**Authorised by:**	

Acceptable Discharge Parameters	Water quality at source	Water quality at Discharge Location
pH (6.5-8.5)		
Turbidity (<50mg/L)		
Visual assessment for oil and grease		

Signed by Project Manager:		Date:	

NO DE-WATERING TO COMMENCE UNTIL PERMIT HAS BEEN COMPLETED AND SIGNED

SSPF38
De-watering Permit
11/06//21
Rev:A

De-watering Permit

DEWATERING LOG / INSPECTION

Project # :		**Project Name:**			
CC Foreman Name:		**Date:**		**Signature:**	
Responsible Person - Name:		**Date:**		**Signature:**	

Regular time intervals for Inspections - Intervals to be determined at time of Permit issue

Date + Time	Company	Setup as per Permit specified	Any changes since Permit issued	Discharge location being maintained	Filter sock/s require changing	Further testing required?	Name	Signed

De-watering Permit Close-out: *Final inspection to ensure no contamination has occurred between source and discharge area*

CC Foreman:	**Signature:**
Date:	**Time:**

IN CASE OF CONTAMINATION - ALL DE-WATERING ACTIVITIES TO STOP IMMEDIATELY - ACTIONS RECTIFIED ASAP AND REPORTED TO SUPERVISOR

Page **3** of **3**

7.2 Daily & Weekly Site Checklists

Form SSPF3
Daily Site Checklist
14/09/20
Rev: E

DAILY SITE CHECKLIST

Project:			
For Week Commencing (Date):			
Person completed by:		**Date:**	

- *Site Inspection to be conducted by Foreman*
- *All high-risk non-complying items to be isolated and rectified immediately*
- *Lower-risk items to be rectified within 48 hours*
- *NCRs to be issued for high-risk non-compliances*

ACTIVITY	RESPONSIBLE	MON	TUE	WED	THU	FRI	SAT
Permit to Dig, Hot Works, Confined Spaces or other required Permits completed and in place	Foreman/SE						
Service search complete, all workers aware of service locations	Foreman/SE						
Safety fences in place around excavations and bar caps on protruding reinforcement and other sharp objects	Foreman/SE						
Plant Onboarding check conducted and Operator competency verified for new plant on site today	Foreman/SE						
Christie Civil and all Subcontractors have conducted machine/plant Daily Pre-start checks	Foreman/SE						
Visually check all environmental controls around site are in good condition and as per CEMP or other plans	Foreman/SE						
All fire extinguishers are tagged, in date, charged and easily accessible	Foreman/SE						
Review controls nominated in SWMS's for effectiveness and update if required	Foreman/SE						
Review and update ITPs as required	Site Engineer						
All workers onsite have been inducted into site and the relevant SWMS	Foreman/SE						
Prestart Meetings have been occurring prior to works commencing each morning	Foreman/SE						

Page 1of 2

Form SSPF3
Daily Site Checklist
14/09/20
Rev: E

DAILY SITE CHECKLIST

Drawing revisions checked and Register updated	Site Engineer	WEEKLY Completed ☐ Not Completed ☐
Container is clean and tidy, tools stored correctly and no hazardous chemicals stored inside	Foreman	WEEKLY Completed ☐ Not Completed ☐
PPE being worn, PPE Register is available and is being completed	Foreman/SE	WEEKLY Completed ☐ Not Completed ☐
Weekly Safety + Environmental Inspection Checklist is being completed and all non-conforming aspects resolved	Foreman/SE	WEEKLY Completed ☐ Not Completed ☐
Weekly Toolbox Talk conducted - consultation taking place with all staff	Foreman/SE	WEEKLY Completed ☐ Not Completed ☐
COMMENTS:		

ACTION ARISING *(issue NCRs as required)*:			
VERIFIED CLOSED-OUT (Site Engineer / Foreman):		**DATE:**	

Page 2of 2

SOPF3.02.8
WHS + Environmental
Inspection Checklist
09/06/21
Rev: H

SAFETY + ENVIRONMENTAL INSPECTION CHECKLIST

- *Inspection to be carried out weekly on site*
- *Subcontractor representatives required to participate to ensure consultation and active involvement in WHSE matters*
- *High-risk non-conformances to be isolated and closed out on the spot, lower-risk items within 48 hours*
- *NCRs/PARs SOPF4.04.1 - NCR PAR to be raised for high-risk or repeated issues and followed through to verified close-out. NCRs allow tracking of issues, compilation and communication of company-wide WHSE data*

Project:		**Date + Time Conducted:**	

Christie Civil staff conducting:					
Name:		**Position:**		**Signed:**	
Name:		**Position:**		**Signed:**	
Name:		**Position:**		**Signed:**	
Name:		**Position:**		**Signed:**	

Subcontractors participating:					
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	
Name:		**Company:**		**Signed:**	

SAFETY ISSUES	Tick OK	CORRECTIVE ACTION/ COMMENTS
1) Excavations, Fencing and Slope Stability:		
Batters cut at correct slope for material?		
For excavations >1.5m deep - is there shoring or benching?		
Falls <1.5m - do they pose a risk and have these risks been controlled?		
Falls >1.5m are fences supplied?		
Falls >1.5m - do fences provide a physical barrier to prevent persons falling? (e.g. handrail)		
Are fences maintained?		
Are all penetrations covered with secured covers?		
Other:		
2) Plant and Machinery:		
Plant Onboarding checks being completed? Check new plant on site this week		
Operators have verification of competency on them?		
Plant certification/ Logbooks being filled out?		
Flashing lights and reversing buzzer operating on mobile plant?		
Chains and slings checked and records kept?		
Other:		

SAFETY + ENVIRONMENTAL INSPECTION CHECKLIST

3) Personal Protective Equipment:	
Are hivis vests being worn by all workers on site?	
Are hard hats being worn by all workers on site?	
Are safety boots being worn by all workers on site?	
Is ear protection being worn when needed?	
Is eye protection being worn when required?	
Is sun protection being used – long sleeves, long pants, hat flaps, sunscreen?	
Are records kept of PPE issue to workers?	
Other:	
4) Electrical Safety:	
Is all electrical equipment tagged for the current month and 3-monthly for items in site shed?	
Are all leads up off the ground and hanging off insulated hangers or supports?	
Are leads no longer than 30m and not joined together?	
Do any multiple outlets include an earth leakage device?	
Other:	

SAFETY + ENVIRONMENTAL INSPECTION CHECKLIST

SAFETY ISSUES	Tick OK	CORRECTIVE ACTION/ COMMENTS
5) Manual Handling:		
Are machines used where possible to handle loads?		
Are loads considered to be too heavy for one man, handled by machine or team lifting?		
Are correct manual lifting procedures used?		
Are manual handling concerns addressed properly?		
Other:		
6) Hazardous Substances:		
Are all fuels stored in a fuel storage facility?		
Is an SDS in SDS folder for every hazardous material?		
Are workers inducted into the hazards of working with that material?		
Is appropriate PPE supplied for that material?		
Are spill kits available for use?		
Is a Hot Works Permit required? If Yes, is it issued, signed off and stored as a record?		
Is there a fire extinguisher with each oxy set?		
Are there flashback arrestors on each oxy set?		
Other:		
7) Traffic Management:		
Is traffic ingress/egress controlled?		
Is access to site delineated to allow safe passage for both persons and machines?		
Does the Traffic Controller have a stop and slow bat?		
Is the Traffic Controller authorised?		
Does each TC have a distinguishing mark on their person stating that they are a qualified Traffic Controller?		
For roadworks, is a TCP issued?		
Is the TCP followed?		
Are records (pre-start and close checklists) completed and stored		
Other:		
8) Service Search/ Permit to Dig:		
Has a Permit to Excavate been completed and issued to all plant operators		
Is hand excavation occurring within 1m of services?		
Has a Dial Before U Dig enquiry been conducted on this project?		
9) Housekeeping, Lighting and Ventilation:		
Is the worksite clean and tidy with good housekeeping to prevent slips, trips and falls?		
If used, is formwork de-nailed after use?		
Is adequate lighting provided at the workface?		
Are bins provided and not overflowing?		

SAFETY + ENVIRONMENTAL INSPECTION CHECKLIST

10) Ladder Safety/ Access:		
Are ladders inclined at a 4 in 1 slope?		
Does the ladder extend more than 1m above the egress?		
Is ladder secured at the top?		
Is the ladder industrial rated and in good condition?		
Other:		
11) Inductions + Competency:		
Have all workers completed the Site-specific Induction? *Spot check 3-4 workers on site*		
Are all personnel inducted into Construction safety (White Card)? *Spot check 3-4 workers on site*		
Are all personnel inducted into Specific activity safety + environmental? *Spot check 1-2 activities*		
Do plant and machinery operators have valid VOCs on them?		
Are Tickets/Certifications current/not expired? *Spot check 3-4 workers on site*		
SAFETY ISSUES	**Tick OK**	**CORRECTIVE ACTION/ COMMENTS**
12) Strike Injuries:		
Is all exposed reo bar protected with bar caps?		
Is there danger from falling objects?		
ENVIRONMENTAL ISSUES	**Tick OK**	**CORRECTIVE ACTION/ COMMENTS**
13) Environmental:		
Are silt control devices installed around stormwater pits?		
Are silt controls installed correctly?		
Are silt controls maintained and effective?		
Is dust controlled as per CEMP?		
Is noise controlled as per CEMP?		
Is vibration controlled as per CEMP?		
Does the site egress have environmental controls, are they effective?		
Is de-watering conducted as per procedure?		
Are elements outside site boundaries inspected e.g., check traffic management signs, no contamination occurred at de-watering site outside site boundary, sediment controls outside site boundary		
Is Community Feedback managed and recorded?		

SAFETY + ENVIRONMENTAL INSPECTION CHECKLIST

RISK AREA OR PROCEDURE	Closed out on the spot	Closed out within 48 hours	NCR/PAR(S) issued *(list NCR numbers)*
1) Excavations, Fencing and Slope Stability			
2) Plant and Machinery			
3) Personal Protective Equipment			
4) Electrical Safety			
5) Manual Handling			
6) Hazardous Substances			
7) Traffic Management			
8) Services Search/ Permit to Dig			
9) Housekeeping, Lighting and Ventilation			
10) Ladder Safety			
11) Inductions			
12) Strike Injuries			
13) Environmental			
14) Other			

ACTION VERIFIED CLOSED-OUT:			
Name:		Position:	
Signed:		Date:	

APPENDIX 6

EMERGENCY PREPAREDNESS AND RESPONSE PLAN

Emergency Management Plan

Ivanhoe Estate - Stage 1B Civil Works
Epping & Lyonpark Rd
Macquarie Park NSW 2113

Revision	Date	Description of Revision	Approved By
01	01/03/22	Initial Issue	Travis McCleary

Contents

1. Purpose and Scope 3
2. Definitions 3
3. SSP9 - Work Related Incidents 3
4. Performance Standards 3
5. Identifying Potential Emergency Situations + Testing Response 3
EMERGENCY EVACUATION PROCEDURE 5
..... 6
SITE EMERGENCY EVACUATION PLAN 6
EMERGENCY RESPONSE PLAN 7
EMERGENCY RESPONSE WARDENS 8
EMERGENCY RESPONSE EQUIPMENT 9
EMERGENCY COMMUNICATION 10
EXCAVATION TRENCH COLLAPSE / CAVE IN PROCEDURE 11
MEDICAL EMERGENCY PROCEDURE 12
FIRE EMERGENCY PROCEDURE 14
FIRE FIGHTING EQUIPMENT 15
HARASSMENT / ASSAULT PROCEDURE 16
SPILL RESPONSE PROCEDURE 17
BOMB THREAT PROCEDURE 18
CHEMICAL SPILL EMERGENCY RESPONSE PROCEDURE 19
MOBILE PLANT INCIDENT PROCEDURE 20
WATER RESCUE PROCEDURE 21
CRANE INCIDENT PROCEDURE 22
TRAFFIC / PEDESTRIAN INCIDENT PROCEDURE 23
SCAFFOLD COLLAPSE INCIDENT PROCEDURE 24
FALL FROM HEIGHT INCIDENT PROCEDURE 25
CONFINED SPACE RESCUE PROCEDURE 26
ELECTROCUTION PROCEDURE 27
TERRORISM PROCEDURE 28
SITE EMERGENCY CONTACT LIST 29

1. Purpose and Scope

The purpose of the EMP is to provide information to assist people at the Ivanhoe Estate – Stage 1B Civil Works project in Macquarie Park to respond quickly and effectively in an emergency, and therefore to minimise harm to people, property and the environment.

The Plan covers the procedures and contact details applicable to the incidents which may occur on the site during the works.

2. Definitions

Incident - an event (e.g. alarm, small chemical spill), which requires an immediate response, but can be
managed relatively quickly using local resources, possibly with the assistance of the Emergency Services

Emergency - an incident which becomes more serious and requires management coordination to address
the wider implications. An emergency usually involves intervention by the Emergency Services

3. SSP9- Work Related Incidents

All project team members are to be inducted in to SSP9-Work Related Incidents during induction in to the Project Emergency Management Plan

4. Performance Standards

- Project-specific emergency procedures will be established at every Christie Civil site
- Emergency procedures will always take in to account / be co-ordinated with Client, other Contractor Emergency procedures, as relevant to the project site
- Emergency procedures must be established, regularly reviewed and updated to account for changes in personnel, site use and any building alterations
- All projects shall participate in emergency evacuation/emergency response scenario drills: within 2 weeks of site establishment, then every 3 months, as a minimum. Drills may be conducted at shorter intervals on projects of short duration or in high-risk environments. This will be risk-assessed at project start-up
- All Site Teams will participate in emergency evacuation/emergency response scenario drills

5. Identifying Potential Emergency Situations + Testing Response

Use this Checklist to identify the potential emergency situations relevant to the project site and include a response procedure for each identified emergency situation

Drills are to be conducted of critical Emergency Situations - use *SSPF14 - Emergency Evacuation Drill*

Fire	Y	Diving Incident	
Spill	Y	Confined Space Incident	Y
Chemical Spill	Y	Scaffold collapse	
Harassment / Assault	Y	Structure collapse	Y
Bomb Threat	Y	Electrocution	Y
Excavation Trench Collapse	Y	Toxic Fumes	
Mobile Plant Incident	Y	Fall from Height	Y
Crane Incident	Y	Explosion	Y
Traffic Incident	Y	Hazardous Material Discovery	Y
Pedestrian Incident	Y	COVID-19	Y
Drowning Incident	Y	Terrorism	Y
Work On, In, Near Water	Y		

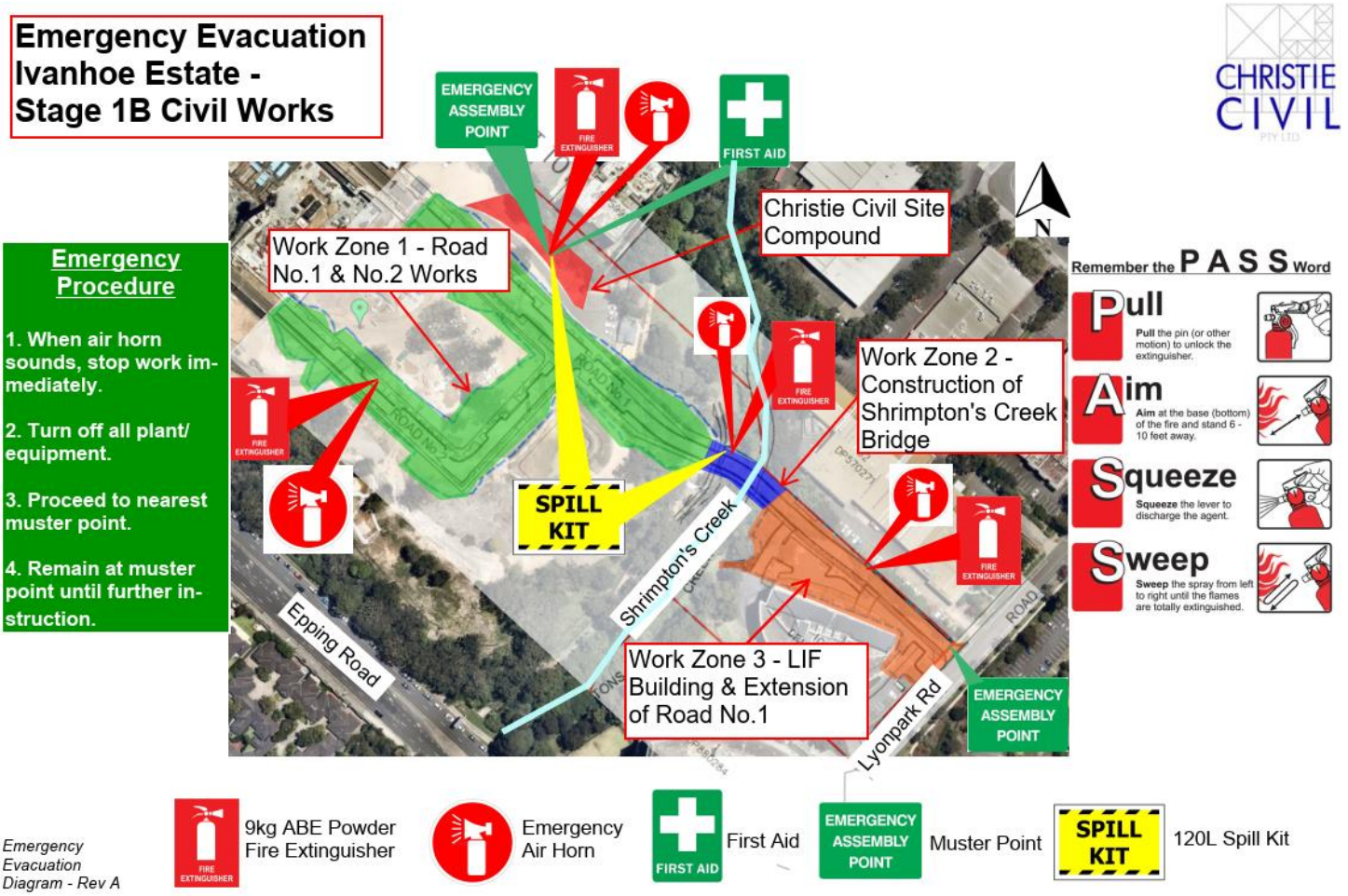
EMERGENCY EVACUATION PROCEDURE

- Notify Site Management of the emergency
- On hearing the evacuation siren / air horn or receiving instructions to evacuate, **cease work** (switch off electrical tools and gas equipment, turn off mobile plant)
- Inform Christie Civil (CC) staff if you require assistance
- Make your way to the nearest emergency exit and proceed to the **Emergency Muster Point** immediately
- **DO NOT** use lifts in the event of evacuation
- Supervisors will check names of employees against the daily attendance sheets and report any missing persons to Site Management who will inform the relevant authorities
- Remain at the Emergency Muster Point until directed by Christie Civil Management

Note:

Visitors are to be directed to designated Muster Point by their Host

SITE EMERGENCY EVACUATION PLAN



EMERGENCY RESPONSE PLAN

ROLE	ACTION
All Personnel including *Other Entities	1. Immediately notify Christie Civil site management and provide details on the type of emergency, location and extent of risk (Refer Emergency Contacts List)
CC Chief Warden	2. Activate evacuation horn located in the Site Office *One continuous blast* signifies an emergency requiring an evacuation
CC Chief Warden	3. Contact Emergency Services (Refer Emergency Contacts List)
CC Chief Warden	4. Contact Area Wardens via radio/phone and Other Entities by phone and coordinate evacuation of the site to the assembly point (CC Warden to contact Other Entities in person if unable to reach them by phone)
CC Area Warden & Other Entity Contact/s	5. Ensure their designated areas are evacuated (visual check) but are not to put themselves at risk Provide assistance to persons where required
CC Chief Warden	6. Take site attendance registers to the assembly point and distribute to the relevant Subcontractor Supervisors
CC Chief Warden & Subcontractor Supervisors	7. Ensure all persons under their control have evacuated and are accounted for
CC Chief Warden & Other Entity Contact	8. Notify emergency services or authorities of those not accounted for or refusing to leave site
CC Chief Warden & Other Entity Contact	9. Advise their workers and Subcontractors when it is safe to return to site and resume work

***Other Entities**: Persons affected by the emergency other than CC site personnel such as Client Representative, Client's Subcontractor/s, Building Manager, Building/Site Security, other Contractors working on/adjacent to site etc.

EMERGENCY RESPONSE WARDENS

Note:

- *Site nominated First Aider must not also be Chief Warden*
- *There must be both a nominated First Aider and Chief Warden/Deputy Chief Warden on site at all times*

ROLE	NAME	RESPONSIBILITY
Chief Warden	Travis McCleary	The Chief Warden makes sure that the site is evacuated and provides a brief to Emergency Services when they arrive at the incident site
Deputy Chief Warden	Liam Bell	The Deputy Chief Warden shall assist as required, and assume all responsibilities of the Chief Warden in their absence
Area Warden	Tristan Bruno	Area Warden(s) ensure that areas of the site are evacuated and report to the Chief Warden
Area Warden	tbc	As above
Area Warden	tbc	As above

EMERGENCY RESPONSE EQUIPMENT

Note:

- *The Project Manager is responsible for identifying the required emergency equipment for the site and works, and must have completed WHS Training for Managers & Supervisors or have min. 5 years' industry experience*
- *Select or delete from, or add to the list below (relevant to the project site)*
- *Sizes, quantities are determined at project start up*
- *The Site Engineer is responsible for maintaining SSPF24 - Emergency Equipment Register throughout the project and must always ensure emergency equipment meets all testing, tagging, calibration, currency and performance requirements*

Equipment	Role	Purpose
Fire Extinguisher (ABE Dry Powder)	Wardens	Respond to small fires, if safe to do so
First Aid Kits	First Aid Officer	Respond to and treat injuries on site
Spill Kits	Wardens	Respond to minor spills
Defibrillator	First Aid Officer	Respond to and treat injuries on site
Emergency Eye Wash	First Aid Officer	Respond to chemical splashes
Emergency shower	First Aid Officer	Respond to contamination from hazardous substances
Confined Space Rescue Kit	Supervisor	Provide and maintain in accordance with Confined Space Permit
Life buoys, PFDs	Supervisor	Working on or near water
Gotcha Kit	Supervisor	Working at heights

EMERGENCY COMMUNICATION

Note:

- *The Project Manager is responsible for identifying the required emergency communication equipment for the site and works, and must have completed WHS Training for Managers & Supervisors or have min. 5 years' industry experience*
- *Select or delete from, or add to the list below (relevant to the project site)*
- *The Site Engineer is responsible for maintaining SSPF24 - Emergency Equipment Register throughout the project and must always ensure emergency equipment meets all testing, tagging, calibration, currency and performance requirements*

Equipment	Role	Purpose
Air Horn	Warden	To evacuate the area/site
Two Way Radio	Supervisor	Contact First Aid Officer/Wardens and provide details on the incident

Refer to SITE PLAN for location of all emergency equipment

EXCAVATION TRENCH COLLAPSE / CAVE IN PROCEDURE

Role	Procedure
All	Immediately contact First Aid Officer or CC Supervisor using verbal, radio etc. On arrival, advise of situation and any immediate hazards, if known
All	Stop work, and shut down plant if required and safe to do so
CC Supervisor	Confirm location of all workers and any injured or trapped workers Secure area and restrict entry
First Aid Officer/CC Supervisor	Assess the situation and assist in releasing the injured workers from being trapped - only if safe to do so Select the most appropriate tools to use to minimise further injury to the injured workers (by hand, hand tools, lifting equipment, etc)
CC Supervisor/Chief Warden	Contact Emergency Services where people are trapped, suspected of being buried, or have a serious injury
Chief Warden	If called, direct Emergency Services into the site and to the location of the incident
First Aid Officer	Attend to and treat injured worker at the location, if safe to do so
First Aid Officer	Remove injured workers from areas where there is potential for further collapse or harm
CC Project Manager	Once all workers are rescued, secure the area Notify CC senior management team (Construction Manager, Directors) Notify relevant authorities as required (SafeWork NSW, OFSC) Commence gathering information for incident investigation

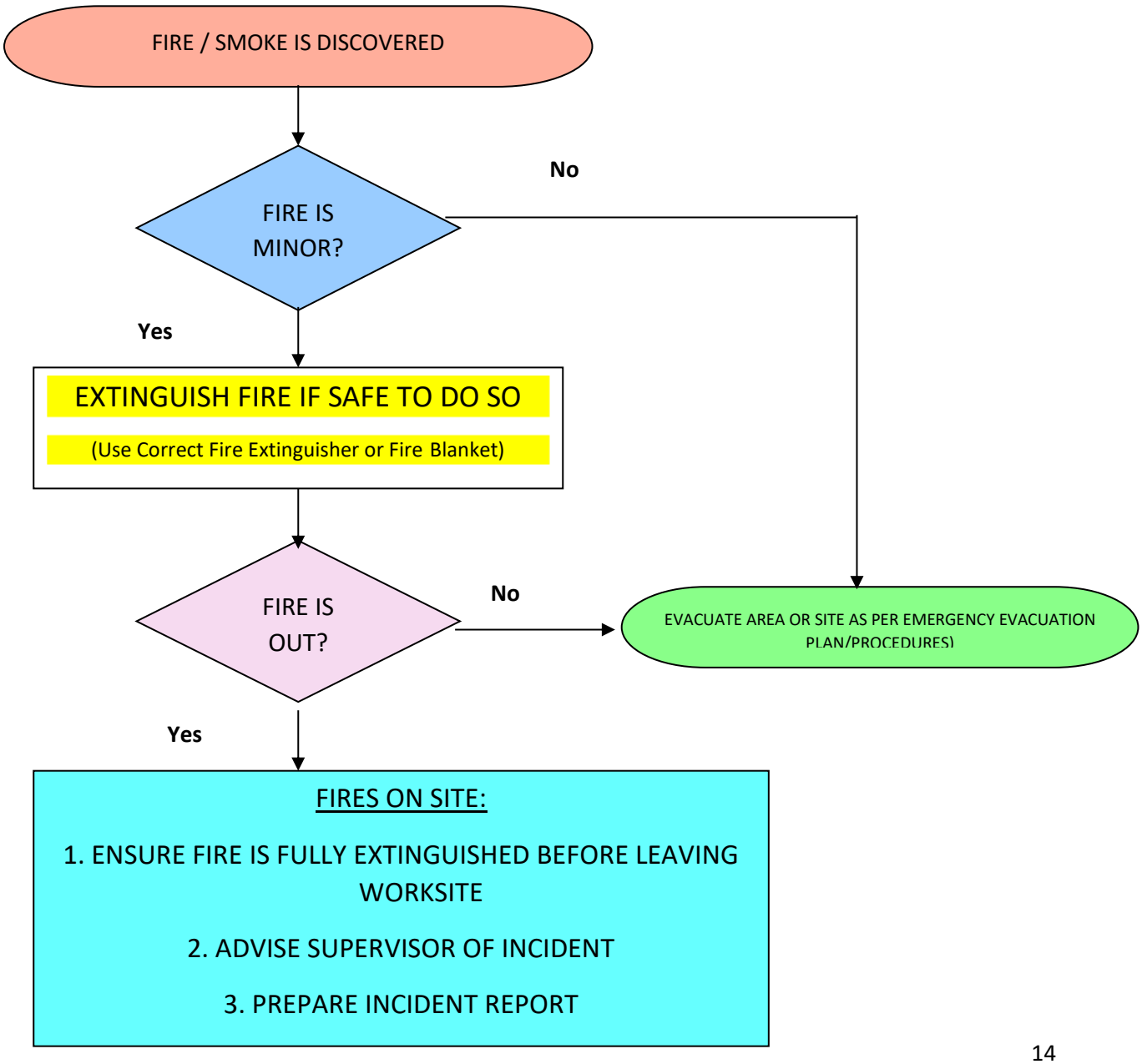
MEDICAL EMERGENCY PROCEDURE

- Do not move a patient unless it is unsafe to leave them where they are
- The Chief Warden to direct Emergency Services to the incident site
- Only disturb the incident site as necessary to administer First Aid
- Report the incident to CC Supervisor / Manager
- Staff involved in the incident will be provided with post-trauma counselling, as necessary

FIRE EMERGENCY PROCEDURE

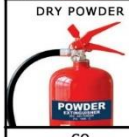
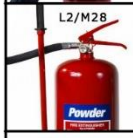
Always test extinguisher before approaching fire.

Remember, fire extinguishers are for small fires only, so never put your life in danger when using them.



FIRE FIGHTING EQUIPMENT

- Select the correct extinguisher for the right application, in the event of a fire
- The wrong type of extinguishers could make the situation worse, or even cause severe injury or death

Pull Aim Squeeze Sweep	A Wood Paper Textiles	B Flammable Liquids	C Flammable Gases	D Burning Metals	E Live Electrical Fires	F Cooking Fat
 WATER	✓	X	X	X	X	X
 FOAM	✓	✓	X	X	X	X
 DRY POWDER	✓	✓	✓	X	✓	X
 CO_2	X	✓	X	X	✓	X
 L2/M28	X	X	X	✓	X	X
 WET CHEMICAL	✓	X	X	X	X	✓

FIRE EXTINGUISHER OPERATION

Know the PASS-word for using portable fire extinguishers.

Pull the pin. TEST it to the side.

Aim low, pointing the extinguisher at the base of the fire.

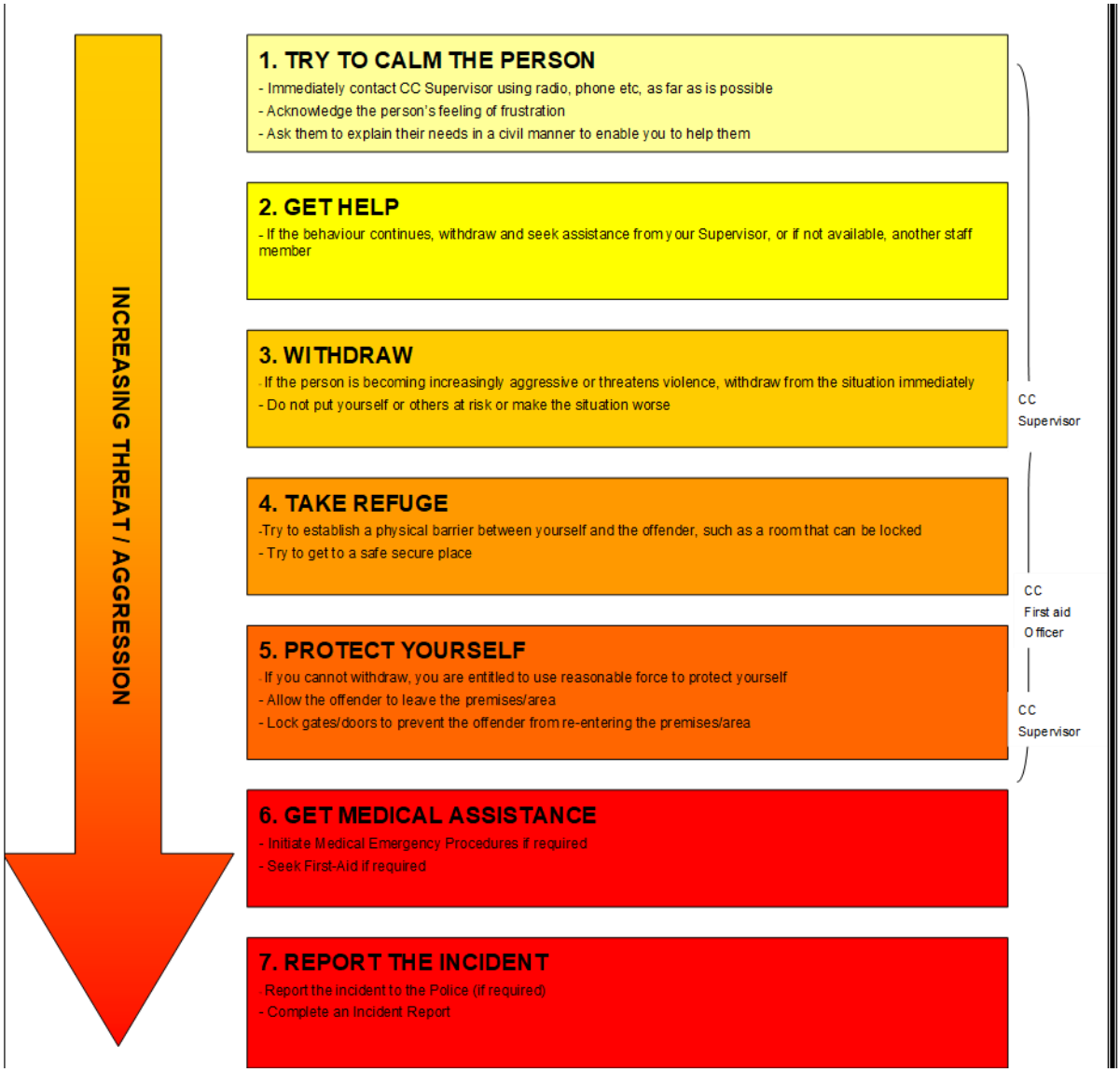
Squeeze the handle. This releases the extinguishing agent.

Sweep from side to side, at the base of the fire until it appears to be out.

HARASSMENT / ASSAULT PROCEDURE

Follow the steps below in managing threat / incident of physical or armed assault:

Violence on site is not tolerated and is grounds for instant dismissal or removal from site (Refer to Site Induction for Site Rules)



SPILL RESPONSE PROCEDURE

Spill has occurred

Immediately advise CC Foreman (All)

For major-hazardous spills call the Fire Brigade immediately on 000)

Stop the source of the spill immediately if safe to do so (All)

Contain the spill using the spill kit and follow SDS precautions (Site Foreman)

- Place mini booms around spill area and protect drains inlets (if applicable)
- Place absorbent material over the spill
- Clean up contaminated absorbent material (including Soil) and place in plastic bags.

(Site Foreman)

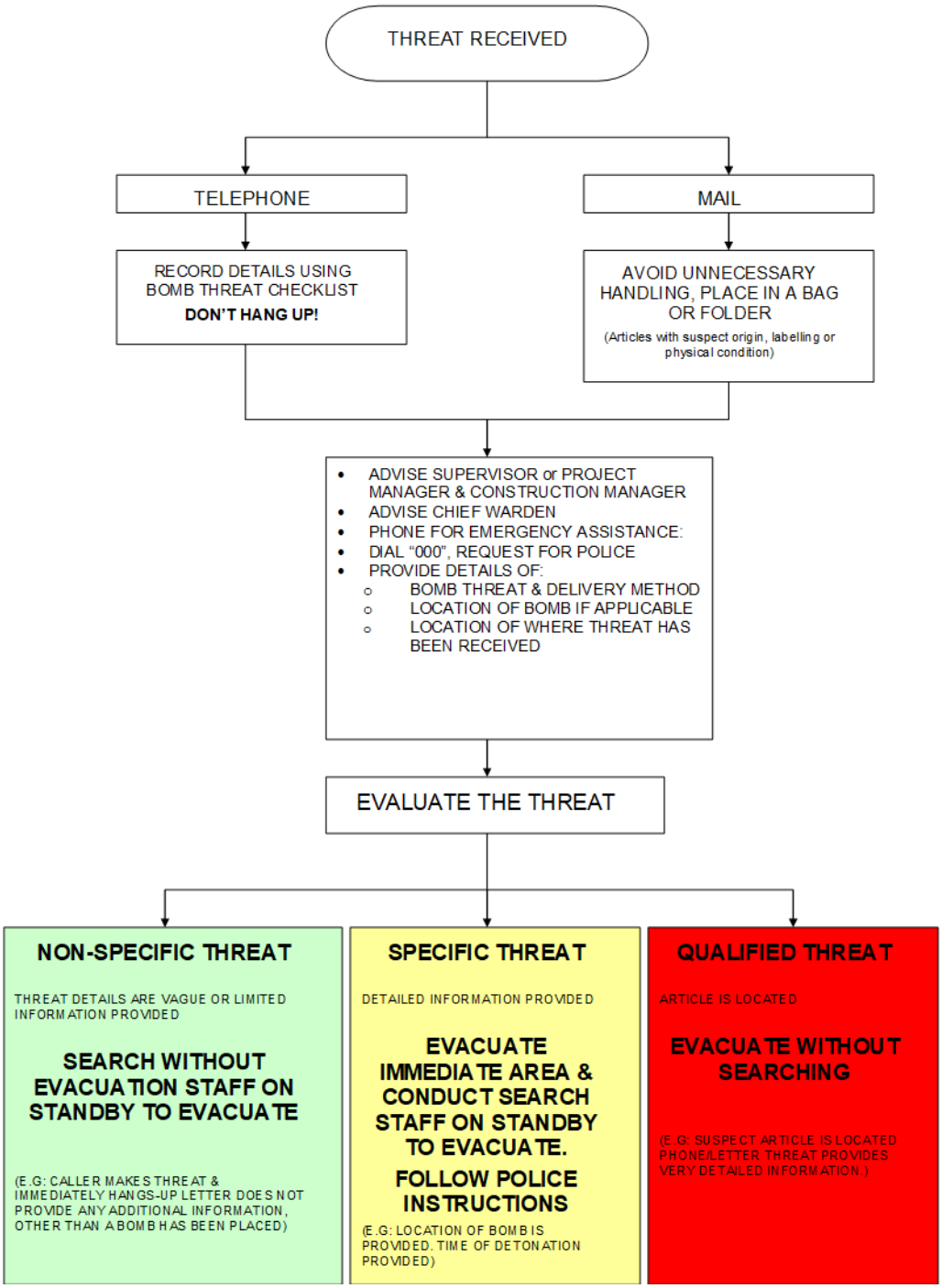
Arrange for the contaminated material to be disposed of through the Waste Services provider (CC Foreman)

Obtain disposal receipts to ensure waste has been disposed of at an authorised depot. (CC Foreman)

Prepare Incident Report for all spills
Notify EPA in case of notifiable incident
(Site Engineer)

Re-Stock Spill kit

BOMB THREAT PROCEDURE



CHEMICAL SPILL EMERGENCY RESPONSE PROCEDURE

Chemical Spills

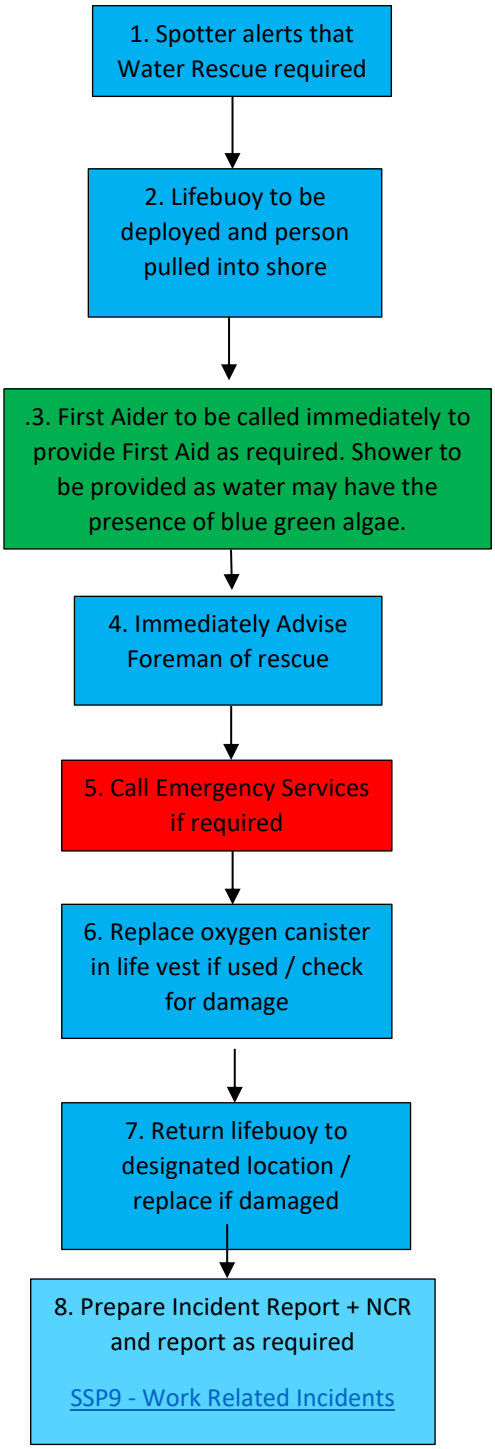
ROLE	ACTION
All Personnel	Stop the source of the spill immediately and Notify the Site Office and provide details on the type of incident, location and extent of damage
Site Foreman	Assess the spill For major hazardous spills call the Fire Brigade immediately on 000
Site Foreman	For minor spills, contain and collect the spill using the spill kit and boom
Site Engineer	Notify the relevant authorities, as required - EPA https://www.epa.nsw.gov.au/reporting-and-incidents/incident-management/duty-to-notify-pollution-incidents Client
Site Engineer	Arrange for the contaminated material to be disposed of appropriately through the Waste Services

MOBILE PLANT INCIDENT PROCEDURE

Mobile Plant Incident

ROLE	ACTION
All Personnel	Stop work immediately and notify Christie Civil site supervisor
Site Foreman	Assess the mobile plant incident Area to be made safe, barricaded off For minor incidents, ensure plant is undamaged and safe to operate All personnel to assemble at the site Assembly Point - Wardens to coordinate Evacuation procedure
Project Manager	For major plant Incidents/Near Misses, Emergency Services and SafeWork to be notified
Site Engineer	Incident Report and NCR to be prepared for all Plant Incidents and Near Misses and followed through to close-out All internal and stakeholder communication to be completed *SSP9 - Work Related Incidents*

WATER RESCUE PROCEDURE



CRANE INCIDENT PROCEDURE

1.	Assess the scene for injuries, trapped personnel or fatalities
2.	First Aid to be performed, if safe to do so
3.	Project Manager to call Fire & Rescue if there are any injured
4.	Area to be made safe, barricaded off and all personnel to assemble at the site Assembly Point - Wardens to coordinate Evacuation procedure
5.	Project Manager to notify SafeWork and await instruction re further management
6.	Client to be notified
7.	Subcontractors / stakeholders to be notified
8.	Complete incident management and investigation - Incident Report Form, Injury Report Form, NCR
9.	If crane is damaged, commence organising the removal of the crane from site safely, following SafeWork and Fire & Rescue instructions
10	Undertake a Toolbox Talk to notify the construction site of outcomes and preventive action

TRAFFIC / PEDESTRIAN INCIDENT PROCEDURE

1.	Traffic Control to notify Site Foreman immediately of Incident/Injury/Near Miss
2.	Project Manager/Site Engineer/Foreman to notify Emergency Services if there are any injured requiring medical attention
3.	First Aid to be provided, if required and safe to do so
4.	Traffic Control to manage the immediate accident scene to ensure safety of pedestrians and traffic
5.	Incident management as per *SSP9 - Work Related Incidents*
6.	Client to be notified
7.	Improvements to traffic co-ordination and pedestrian management as identified from incident investigation
8.	Undertake a Toolbox Talk to notify the construction site of outcomes/changes

SCAFFOLD COLLAPSE INCIDENT PROCEDURE

1.	Assess the scene for injuries, trapped personnel or fatalities
2.	Provide First Aid, if safe to do so
3.	Project Manager to call Fire & Rescue if there are any injured or trapped personnel
4.	PM to notify SafeWork NSW and await instruction re further management
5.	Area to be made safe, barricaded off and all personnel to assemble at the site Assembly Point - Wardens to coordinate Evacuation procedure
6.	Initiate reporting and investigation *SSP9 - Work Related Incidents*
7.	Client and Subcontractors to be notified
8.	Initiate the organisation of the removal of the scaffolding from where it has collapsed – following SafeWork and Fire & Rescue instruction
9.	Undertake a Toolbox to notify the construction site of outcomes
10	Rectification and preventive action from investigation to be implemented

FALL FROM HEIGHT INCIDENT PROCEDURE

1.	Assess the scene for injuries, trapped personnel or fatalities
2.	Initiate Rescue Plan
3.	Provide First Aid, if safe to do so
4.	Project Manager to call Fire & Rescue if there are any injured or trapped personnel
5.	PM to notify SafeWork NSW and await instruction re further management
6,	Area to be made safe, barricaded off and all personnel to assemble at the site Muster Point - Wardens to coordinate Evacuation procedure
7.	Wardens to coordinate site Evacuation procedure, as required
8.	Initiate reporting and investigation *SSP9 - Work Related Incidents*
9.	Undertake a Toolbox to notify the construction site of outcomes
10.	Rectification and preventive action from investigation to be implemented

CONFINED SPACE RESCUE PROCEDURE

Control Measures	• Ensure there is no lone worker completing works • Confined Space Permit and entry procedures in place prior to entering • Rescue person and an additional standby worker to be above pit (rescue person to winch worker out, standby to call emergency services if required) • Standby and rescue personnel monitoring the work from outside of the confined space • Exclusion zones to be in place and danger signage • Worker to be connected on a safety harness at all times during access • Rescue tripod stand set up • Air monitored and recorded prior to entering confined space • Exhaust fan to be in work area (if required)
Immediate Action	**Emergency rescue procedure for worker/s** 1. Check area is safe for all workers prior to attempting to rescue any worker 2. If worker is unconscious, emergency services is to be contacted immediately on 000 3. If there is no response from the worker the worker will be winched out and attempts to establish patient level of consciousness will be done outside of the confined space

Figure 1 Confined Space Rescue Gear

ELECTROCUTION PROCEDURE

1.	Person/s has been injured by electrical shock
2.	First Aider/s to be contacted as well as Project team - extreme caution on approach to injured person and area
3.	Separate person/s from currents – *only if safe to do so*
4.	Area Warden to implement an exclusion zone around the patient
5.	Project Manager to contact authorities
6.	Injured person/s to be taken to Medical centre/Hospital for assessment/treatment
7.	All personnel to be evacuated from site to Assembly Point
8.	Project Manager to contact Client
9.	Initiate reporting and investigation *SSP9 - Work Related Incidents*
10.	Undertake a Toolbox to notify the construction site of outcomes
11.	Rectification and preventive action from investigation to be implemented

TERRORISM PROCEDURE

In the very unlikely event of an attack or suspicious scenario, the Project Management team is to act decisively and promptly.

The following procedure is to be followed if a terrorism-related incident were to occur on site:

1.	Project team to evacuate all personnel off site and to Assembly Point, if safe to do so
2.	Call authorities and emergency personnel immediately
3.	If primary evacuation route is no longer safe, employees to find an alternative route – or find a place to hide
4.	Employees to lead, guide and advise Subcontractors on the situation
5.	Project Manager to contact authorities
6.	Employees to follow the instructions of Authorities on arrival
7.	Project Manager to contact the Client and follow instructions from Authorities in order to notify workers when to return to work

SITE EMERGENCY CONTACT LIST

Project Site:	**Ivanhoe Estate – Stage 1B Civil Works**	
Name	**Position**	**Contact mobile**
Site Foreman		
Tristan Bruno		0405 771 132
Site First Aid Contacts		
Tristan Bruno	Site Foreman	0405 771 132
Liam Bell	Site Engineer	0401 464 166
Travis McCleary	Project Manager	0402 286 402
Simon Xin	Site Engineer	0435 211 566
Contact	**Phone Number**	**Address**
Emergency Services – Police, Ambulance, Fire	000	
Medical Centre	02) 9878 6666	Macquarie Medical Centre, Shop 45, L2, Macquarie Shopping Centre
Hospital	02) 9887 5500	Macquarie Hospital, Wicks Rd, North Ryde
Police Station	02) 9808 7401	810 Victoria Rd, Ryde
Telstra	13 22 03	
Sydney Water	13 20 90	
Ausgrid	13 13 88	
SafeWork NSW	13 10 50	
EPA NSW	13 15 55	
MEND – Employee Assistance, Counselling	1300 174 022	

APPENDIX 7

Site Layout Plan

APPENDIX 8

Construction Noise and Vibration Management Plan
CNVMP

Construction Noise & Vibration Management Plan
CNVMP

SSD 8903 Condition B42

Ivanhoe Estate
Stage 1B Civil Works
Epping & Lyonpark Roads
Macquarie Park
NSW 2113

Date: 22/02/22
Rev: A

Noise & Vibration Management PlanTemplate - Document Control + Change History

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Note:

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CNVMP - Document Control and Change History

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The Project Manager is responsible for ensuring correct management of superseded versions and archiving on the Christie Civil server.

Revision	Date	Description of Revision	Created by	Approved by Project Manager	Approved by Construction Manager
A	**22/02/22**	Initial Issue	Michael Fitzgerald	**Travis McCleary**	**Martin Cartey**

Contents

1. Introduction 5

2. Location of works 6

3. Hours of work 8

4. Project requirements 8

5. Affected properties 9

6. Existing Acoustic Environment 10

7. Noise Management Level 11

8. Noise Mitigation Methods 12

9. Vibration management 15

9.1 Vibration Producing Activities 15

10. Reference documents 15

1. Introduction

Christie Civil is a medium-sized civil contractor undertaking various projects of differing types on a continual basis throughout New South Wales. A large proportion of these projects involve activities associated with earthworks, bringing with them a potential risk of noise and vibration.

This noise and vibration management plan identifies risks and control measure during the construction of the stage 1B works on the Ivanhoe Estates, Macquarie Park project.

This Construction Noise and Vibration Management Plan (CNVMP) has been developed in conjunction with the Ivanhoe Estate, Macquarie Park acoustic assessment by Acoustic Logic November 2017.

Frasers Properties have awarded Christie Civil the Contract to complete Stage 1B Civil and bridge works to the Ivanhoe Estates project at Macquarie Park. The concept of stage 1B is to construct an access road from stage 1B through to Lyonpark Road. The works involve construction of a curved post tensioned bridge, road and drainage works, access and carpark works to an existing operation building.

Activities include:

- Site clearing
- New driveway entrance to LIF building carpark
- Temporary access over Shrimptons creek
- 10 Bored piles
- Form, reo, pour abutments, retaining walls, bridge piers
- Falsework to bridge deck
- Form, reo, pour bridge deck
- Post tensioning of bridge deck
- Steel handrails and bike guides
- Street and bridge lighting
- Gabion cladding
- Road construction including
- Excavation for roads and services
- Place basecourse
- Kerb and gutter
- Asphalt
- Line marking
- Relocation of electrical kiosk
- Electrical works
- Services works
- Stormwater works including GPT
- Paving
- Landscaping

This noise and vibration management plan identifies risks and control measure during the construction of the stage 1B works on the Ivanhoe Estates, Macquarie Park project.

Generally these works would not be considered activities that produce a high level of noise or vibration.

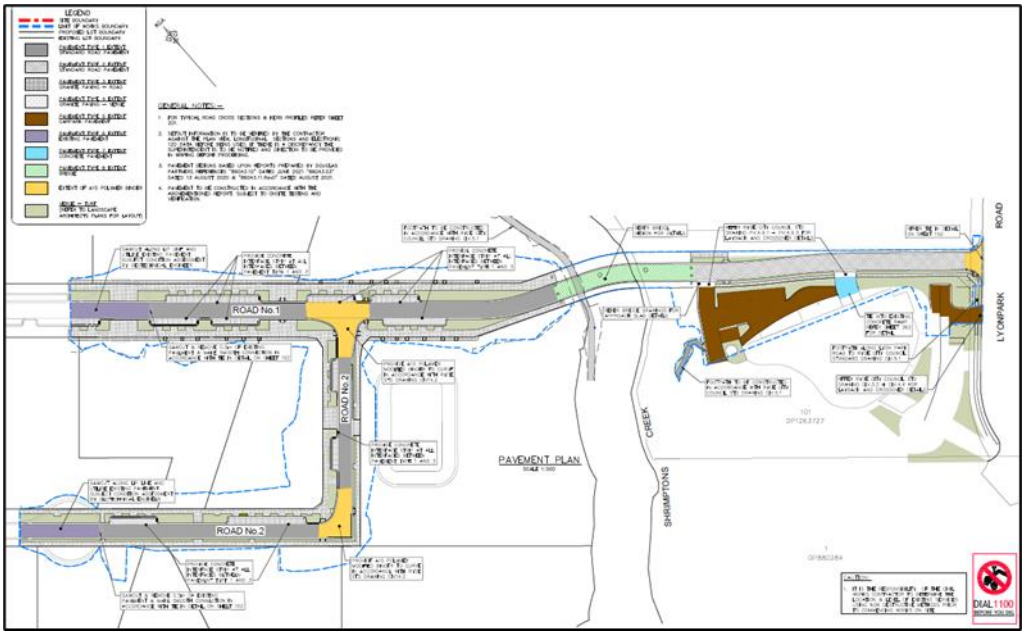
Works are expected to commence in March 2022 and are planned to be completed early 2023.

2. Location of works

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). The site is approximately 8.2 hectares and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. An aerial photo of the site is provided at Figure 1 below. Immediately to the north of the site are a series of four storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot that is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment. Epping Road runs along the south-western boundary of the site and Shrimptons Creek, an area of public open space, runs along the south-eastern boundary. Vehicle access to the site is via Herring Road. Ivanhoe Estate comprised of 17 individual lots owned and managed by the NSW Land and Housing Corporation. The Masterplan site also incorporates adjoining land, being a portion of Shrimptons Creek and part of the commercial site at 2-4 Lyonpark Road. This land is included to facilitate a bridge crossing and road connection to Lyonpark Road.

Stage 1A of the Staging Plan forms this contract for civil works and Building A1 bulk earthworks

Scope of work associated with this management plan is Stage 1B



3. Hours of work

Normal working hours on site are as follows:

Monday to Friday:	7.00am – 7.00pm
Saturday:	8.00am – 4.00pm
Sundays & Public Holidays: no work	

Activities may be undertaken outside of these hours if required:

(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or
(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm.

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

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

Monday to Friday:	9:00am – 12:00pm
	2:00pm – 5:00pm
Saturday:	9.00am – 12.00pm

4. Project requirements

This Construction Noise and Vibration Management Plan has been developed in response to Development consent SSD8903, in particular, specific requirement B42 which requires:

*Prior to the commencement of any works, a **Construction Noise and Vibration Management Plan** (CNVMP) prepared by a suitably qualified person shall be submitted to the Certifier. The CNVMP must be prepared in consultation with, and address the relevant requirements of, Council and the EPA. The CNVMP shall address (but not be limited to):*

a) be prepared in accordance with the EPA's Interim Construction Noise Guideline

b) identify nearby sensitive receivers and land uses;

c) identify the noise management levels for the project;

d) identify the construction methodology and equipment to be used and the key sources of noise and vibration;

e) details of all reasonable and feasible management and mitigation measures to be implemented to minimise construction noise and vibration;

f) be consistent with and incorporate all relevant recommendations and noise and vibration mitigation measures outlined in the Stage 1 DA Acoustic Assessment, prepared by Acoustic Logic, dated 15 October 2019

g) ensure all potentially impacted sensitive receivers are informed by letterbox drops prior to the commencement of construction of the nature of works to be carried out, the expected noise levels and duration, as well as contact details for a construction community liaison officer; and

h) include a suitable proactive construction noise and vibration monitoring program which aims to ensure the construction noise and vibration criteria in this consent are not exceeded.

Prior to the commencement of works, a copy of the CNVMP demonstrating compliance with the above must be submitted to the Planning Secretary.

5. Affected properties

The nearest impacted noise receiver to the stage 1B works is:

- Receiver 7 – Commercial building located at 2-4 and 6-8 Lyonpark Rd, North and South of the roadworks. North East and South East of the bridgeworks.

Extracted from Acoustic Logic *"Master Plan for Ivanhoe Estate, Macquarie Park – Additional Noise Monitoring 30/1/2020*".

6. Existing Acoustic Environment

The acoustic environment is categorised by High background noise levels during the day and evening due to traffic movements along Herring Road and Epping Road. Medium background noise levels during the night as most of the volume of traffic has finished for the day.

Summarised rating **background noise** levels for each receiver are presented below:

Location	Time of day	Rating Background Noise Level dB(A)L90
Consolidated site	Day	42
Consolidated site	Evening	39
Consolidated site	Night	34

7. Noise Management Level

Construction noise management levels applicable to the development have been determined based on the minimum background noise level recorded and the construction noise management level detailed in of this report. Noise management Level for the construction period of the site are detailed in table below:

Receiver	Category	Time of Day	Background Noise Level dB(A) L90	Construction Noise Management Level dB(A)Leq(15min	"Highly Noise Affected" Level dB(A)Leq(15min)
R1 & R2	Monday to Friday	0700 - 1800	42	52	75

Extract Acoustic Logic *"Master Plan for Ivanhoe Estate, Macquarie Park*

Proposed noise making plant on site:

Clearing and demolition • Chainsaws • Chipping • Excavator bucket and hammer • Truck loading and moving and reversing	**Bridge piers and footings** • Drill rig – bored piers • Excavator bucket
Concrete works • Tradesman hammering • Concrete pump and vibrator • Crane	**Roadworks and services** • Excavator with bucket • Grader • Compaction with 10t vibrating roller • Truck movements / tipping
Metalwork on bridge • Hammering • Grinding	**Paving** • Deliveries • Paver saw
Landscaping • Excavator bucket	

These plant items are not expected to exceed objective noise level. In the event of a complaint, Christies Civi'ls complaint procedure shall be adopted. All noise complaints shall be reported to Frasers Property. Additional noise receivers may be required to be established if multiple complaints are made.

8. Noise Mitigation Methods

In an effort to minimise noise and complaints, the following noise mitigation methods shall be adopted.

- Notification - Prior to commencement of any works adjacent to the two existing commercial building, tenants should be notified of the commencement of works
- Excavation and Piling - Piling shall be carried out using bored piered methods to reduce noise and vibration.
  Wherever feasible, hydraulic hammering should be minimised in favour for the use of excavators with a bucket.
- Where high noise generating works are proposed to be undertaken, respite hours should be implemented to reduce the impact on surrounding receivers. Limit the use of any required hydraulic hammers and grinding activities to between 10:00am – 1:00pm and 2:00pm - 5:00pm Monday to Friday and between 10:00am - 1:00pm on Saturdays. This equates to a maximum of three-hour blocks of high generating noise activity, separated by a minimum 1 hour respite period.
- Vehicle Noise - Trucks must turn off their engines during idling to reduce impacts on nearby receivers (unless truck ignition needs to remain on during concrete pumping). Minimise truck reversing. Plant and equipment should be off when not in use.
- Deliveries should use straps in place of chains for handling materials wherever possible. Deliveries should be scheduled during less sensitive time periods (after 9am), wherever practical.
- When selecting construction equipment to be used on the project, the noise levels of plant and equipment should be considered, whereby equipment selected has an equivalent or lower sound power level than the predictive sound power levels of equipment maintained within this report.
- All employees, contractors and sub-contractors are to undergo an environmental induction which outlines noise management techniques.
- Unnecessary shouting should be avoided on site, and appropriate signage should be installed to remind workers of their responsibility to reduce noise impacts where feasible. Loud music from radios and stereos is not permitted.
- Materials should be placed gently and not thrown, to avoid making crashing noises
- During the construction stage, and where practical and safe to do so, handheld construction equipment should be used within the building shell to minimise noise impacts on adjacent receivers.
- Non-tonal reversing beepers should be implemented where possible on all construction equipment and mobile plant used regularly on site.
- Maximum delivery vehicle speed of 10km/h through service road.
- Locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers. Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.
- Eliminate or replace machinery or equipment by those that produce no or lesser noise levels.
- Maintain machinery or equipment at a high standard eliminating faulty parts, loose bearings, poor lubrication etc.
- All new workers should be notified of noise mitigation and the location of receptors at their induction.

Mitigation measure	Timing
No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.	During construction
Attended vibration measurements are recommended at the commencement of vibration generating activities to determine site specific minimum working distances. Vibration intensive work should not proceed within the minimum working distances unless a permanent vibration monitoring system is installed approximately a metre from the building footprint, to warn operators (via flashing light, audible alarm, SMS etc.) when vibration levels are approaching the peak particle velocity objective	During construction
Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods. Consideration should be given to avoiding examination periods	During construction
High noise and vibration generating activities (e.g. rock breaking) may only be carried out in continuous blocks, not exceeding three hours each, with a minimum respite period of one hour between each block	During construction
Use quieter and less vibration emitting construction methods where feasible and reasonable. Equipment would be regularly inspected and maintained to ensure it is in good working order	During construction
• Avoid simultaneous operation of noisy plant within discernible range of a sensitive receiver. • the offset distance between noisy plant and adjacent sensitive receivers is to be maximised. • Plant used intermittently to be throttled down or shut down. • Plant and vehicles to be turned off when not in use. • Noise-emitting plant to be directed away from sensitive receivers.	During construction
Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site	During construction
Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work	During construction
• Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. • Select site access points and roads as far as possible away from sensitive receivers. • Dedicated loading/unloading areas to be shielded if close to sensitive receivers. • Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible.	During construction
• Schedule and route vehicle movements away from sensitive receivers and during less sensitive times.	During construction

Mitigation measure	Timing
• Limit the speed of vehicles and avoid the use of engine compression brakes. • Maximise on-site storage capacity to reduce the need for truck movements during sensitive times.	
Where possible reduce noise from mobile plant through additional fittings including: • Residential grade mufflers • Damped hammers such as "City" Model Rammer Hammers • Air parking brake engagement is silenced	During construction
The use of less vibration-intensive methods of construction or equipment is preferred where practical to reduce the potential for cosmetic damage. All equipment should be maintained and operated in an efficient manner, in accordance with manufacturer's specifications, to reduce the potential for adverse vibration impacts	During construction
Attended vibration measurements are undertaken when work commences, to determine site-specific minimum working distances. Vibration intensive work should not proceed within the minimum working distances unless a permanent vibration monitoring system is installed around one metre from the building footprint, to warn operators (e.g. via flashing light, audible alarm, SMS) when vibration levels	During construction

9. Vibration management

9.1 Vibration Producing Activities

Proposed activities that have the potential to produce significant ground vibration include:

- Vibrating roller during roadworks

The vibration produced from a 10t vibrating roller and the frequency of the vibration is not expected to impact either of the adjoining buildings on Lyonpark Road. The subgrade is expected to be a clay base which will also assist in absorbing vibration. It is not proposed to establish additional vibration monitors.

It is recommended that we establish a direct communication with the potentially effected commercial building and it is noted that ta dilapidation report shall be conducted prior to commencing works.

In the event of a complaint, Christies Civils' complaint procedure shall be adopted.

All vibration complaints shall be reported to Frasers Property.

10. Reference documents

- Ivanhoe estate. Macquarie Park, Stsge1 DA Acoustics assessment – 6 November 2017
- Department of Planning and Environment (DPE) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).
- City of Ryde Development Control Plan 2014;
- NSW Department of Planning and Environment's Document – 'Developments near Rail Corridors or Busy Roads – Interim Guideline';
- Australian and New Zealand AS/NZS 3671:1989 'Acoustics—Road traffic noise intrusion—Building siting and construction';
- Australian and New Zealand AS/NZS 2107:2016 'Recommended design sound levels and reverberation times for building interiors';
- NSW Planning Noise Policy for Industry 2017;
- Association of Australian Acoustical Consultants "Technical Guideline Child Care Centre Noise Assessment" 2013;
- Australian Standards AS2436:2010 Guide to Noise Control on Construction, Maintenance and Demolition Sites; and
- NSW Environmental Protection Agency Interim Construction Noise Guideline German Standard DIN 4150.
- Reference documents EPA interim construction noise Guidelines 2009

APPENDIX 9

Air Quality and Odour Management Plan AQOMP

Air Quality & Odour Management Plan AQOMP

SSD 8903 Condition B43

Ivanhoe Estate
Stage 1B Civil Works
Epping & Lyonpark Roads
Macquarie Park
NSW 2113

Date: 22/02/22
Rev: A

Air Quality & Odour Management PlanTemplate - Document Control + Change History

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AQOMP - Document Control and Change History

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Contents

1. Air Quality and Odour Management Plan (AQOMP) 5

1.1 Introduction 5

1.2 Potential pollutants and emission sources 7

1.3 Pollutants of concern 7

1.4 Sensitive receptors 7

2. Construction 9

3. Mitigation Options 10

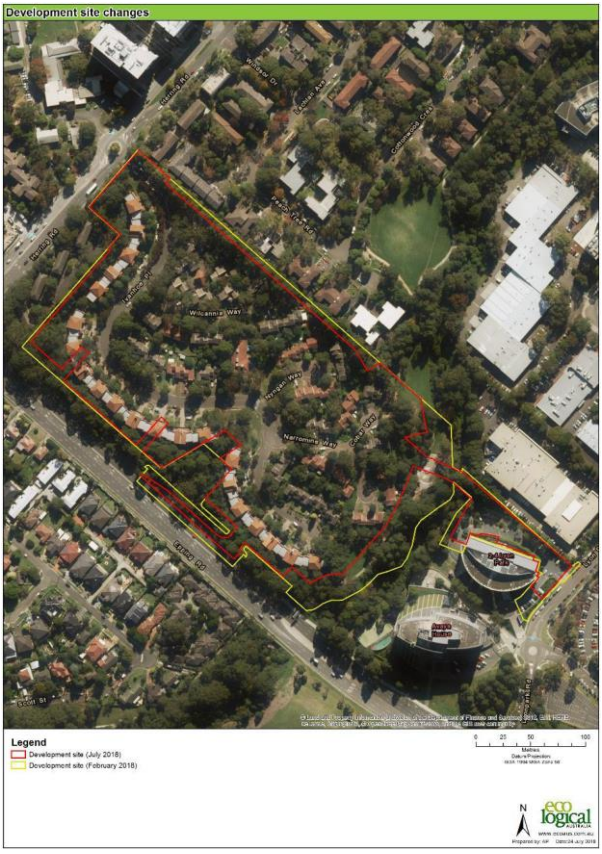
1. Air Quality and Odour Management Plan (AQOMP)

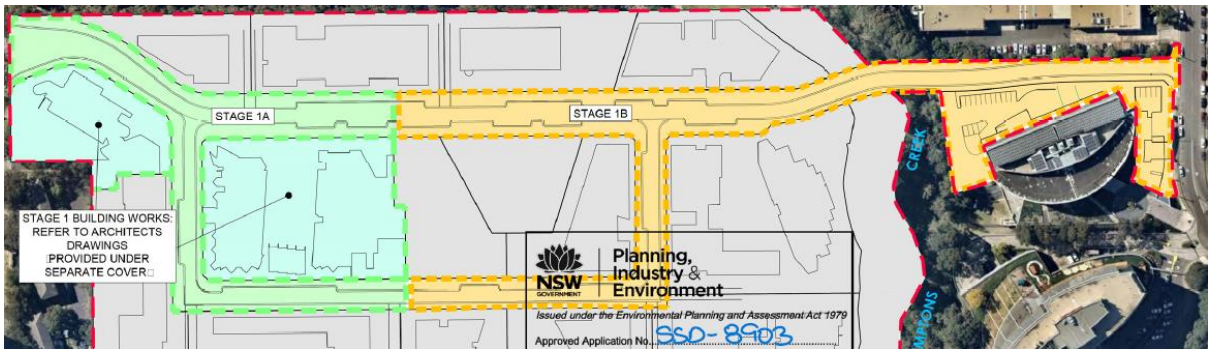
1.1 Introduction

Frasers Properties have awarded Christie Civil the Contract to complete Stage 1B Civil and bridge works to the Ivanhoe Estates project at Macquarie Park. The concept of stage 1B is to construct an access road from stage 1B through to Lyonpark Road. The works involve construction of a curved post tensioned bridge, road and drainage works, access and carpark works to an existing operation building.

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). The site is approximately 8.2 hectares and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. An aerial photo of the site is provided at Figure 1 below. Immediately to the north of the site are a series of four storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot that is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment. Epping Road runs along the south-western boundary of the site and Shrimptons Creek, an area of public open space, runs along the south-eastern boundary. Vehicle access to the site is via Herring Road and Lyonpark Road. Ivanhoe The Masterplan site incorporates adjoining land, being a portion of Shrimptons Creek and part of the commercial site at 2-4 Lyon park Road. This land is included to facilitate a bridge crossing and road connection to Lyon park Road.

The works area is effectively bounded by Herring / Epping and Lyonpark Roads in Macquarie Park, Sydney.





The scope of this contract involves construction of Stage 1B as shown in the sketch above.

This Air quality and odour management plan (AQOMP) plan has been produced to identify risks and manage those risks for the construction of stage 1B. This document is based on WSP Air Quality Assessment Report October 2018

Stage 1B can be identified in three sections:

- Area West of proposed bridge
- The Shrimptons creek bridge
- The area East of the bridge

The activities involved with the construction of the new bridge are:

- Clearing works either side of the creek up to the abutments
- Construction and eventual removal of a temporary access way across the creek to the South of the proposed bridge.
- Possible temporary filling of the creek to create a foundation platform for the falsework of the bridge deck.
- Platforms for piling rigs and cranes
- Piling works
- For, reo, pour works
- Construction of the concrete bridge deck
- Bridge finishing works including railing and paving
- Installation of rock scour protection on embankments and enhancing riparian zone of the creek.
- For, reo, pour works
- Construction of the concrete bridge deck
- Bridge finishing works including railing and paving
- Installation of rock scour protection on embankments of the creek.

1.2 Potential pollutants and emission sources

During the construction of Stage 1B of the Ivanhoe Estate, the following activities will take place:

The activities involved with the construction of the new bridge are:

- Clearing works either side of the creek up to the abutments
- Construction and eventual removal of a temporary access way across the creek to the South of the proposed bridge.
- Possible temporary filling of the creek to create a foundation platform for the falsework of the bridge deck.
- Platforms for piling rigs and cranes
- Piling works
- Form, reo, pour works
- Construction of the concrete bridge deck
- Bridge finishing works including railing and paving
- Installation of rock scour protection on embankments and enhancing riparian zone of the creek.
- Form, reo, pour works
- Construction of the concrete bridge deck
- Bridge finishing works including railing and paving
- Installation of rock scour protection on embankments of the creek.

1.3 Pollutants of concern

The main air pollutants that can arise during the above construction and demolition works are (IAQM, 2014):

- particulate matter (total suspended particulates (TSP), PM10 and PM2.5) from dust-generating construction activities and from vehicle exhaust,

- Nitrogen dioxide (NO2), sulfur dioxide, (SO2), and carbon monoxide (CO) due to exhaust emissions from diesel powered vehicles and equipment used on-site (non-road mobile machinery) and vehicles accessing the site.

1.4 Sensitive receptors

Sensitive receptors (SRs) are defined as people or places that may be impacted by air emissions. Examples of sensitive receptors include residential dwellings, schools, hospitals, offices or public recreational areas (NSW EPA 2016).

SRs already in the vicinity of the site may experience air quality impacts as a result of the Stage 1B works.

The nearest existing SRs that may be affected by construction activities include the existing offices either side of the Lyonpark Road entry and the properties to the North of Road 1. The sensitive receptors are presented in Table below. The SRs are shown on Figure 1,

Figure 1

SR1-5

SR6 and SR7

Sensitive receptor table

RECEPTOR	DESCRIPTION	DIRECTION FROM SITE	DISTANCE FROM SITE
SR1	Multi-storey residential buildings located at 112 – 120 Herring Road	north-west	16M
SR2	Multi-storey residential buildings located at 155 – 159 Herring Road and 5 – 11 Windsor Drive	north-west	8M
SR3	Tertiary teaching institution located at 122 Herring Road (Morling College)	north	32M
SR4	Multi-storey residential buildings located at 137 – 143 Herring Road	east and south-east	5M
SR5	Multi-storey residential buildings located at 1 – 5 Peach Tree Road	north-west	20M
SR6	2-4 LIF Syngenta / ICON building	South	5m
SR7	6-8 Lyonpark Road	North	10m

For the purpose of this assessment, the SRs 5, 6 and 7 are considered highly sensitive to both nuisance dust and noise.

2. Construction

During the construction phase, potential air quality impacts are associated with the generation of particular matter and gaseous emissions. These are typically emitted from construction equipment and associated vehicular traffic. Areas of concern in relation to air quality from construction of Stage 1B of the Ivanhoe Estate development are:

- Site preparation works including tree removal, earthworks and demolition of existing pavements,
- Construction of an internal road network including Shrimpton's Creek bridge and connection to Lyonpark Road.
- Construction of the Shrimptons creek bridge.

During all works relating to construction, there is a potential for dust and particulate matter to have a nuisance impact on SRs 5,6 and 7.

Dust generation may be due to the following activities:

- Vehicle moments causing wheel generated dust.
- Ripping of sandstone
- Demolition of concrete
- Loose construction material being transported off-site by localized winds
- Stockpiles and stripped surfaces

During the construction phase, there is also potential for vehicle exhaust emissions (comprising NO2, SO2, CO and particulate matter) from construction-related traffic.

Meteorological conditions show that the site typically receives a moderate amount of rainfall, which will aid with dust suppression. Strong westerly winds typical at the site would aid in dissipating air pollutants away from nearby sensitive receptors. SR1 is a high sensitivity receptor. During all works relating to construction, there is a potential for dust and particulate matter to have a nuisance impact on SRs 6 and 7

3. Mitigation Options

Construction activities were assessed as having low potential to generate dust and vehicular emissions during demolition and construction. Any emissions to air are likely to come from vehicle moments, excavation, construction works, and soil and construction materials being stored on site and transported offsite. However, with implementation of a well-practised mitigation management plan, dust issues onsite can be contained and thus controlled to meet air quality objectives.

The following mitigation measures described below will be implemented:

- Vehicles and plant/equipment should be fitted with appropriate emission control equipment and be serviced and maintained in accordance with the manufacturers' specifications.
- Loads comprising loose material entering or leaving a site should be covered.
- Dusty activities should be dampened, particularly during dry weather.
- Drop heights for materials should be minimised to control the fall of materials.
- Cutting of materials such as concrete slabs or bricks should be undertaken with extraction or suppression where possible. Pouring water over material as it is being cut can greatly reduce the amount of dust generated.
- Skips should be securely covered.
- Materials should be removed from site as soon as practicable, or stored on site with appropriate coverings and dampening until removal is possible.
- All stockpiles should be covered
- All loose cleared ground should be covered by geofabric or light approved vegetation – hydroseed

Construction air quality mitigation measures will be developed with the managing contractor leading up to and during the construction phase. The managing contractor is key to the provision of these measures as they will inform the construction processes to be assessed, and ensure that all operational and physical noise and vibration mitigation takes place.

APPENDIX 10

Waste Management Plan
WMP

Construction Waste Management Plan
CWMP

SSD 8903 Conditions B43,B44,B65,C28,C31,C32,C33,C34

Ivanhoe Estate
Stage 1B Civil Works
Epping & Lyonpark Roads
Macquarie Park
NSW 2113

Date: 28/02/22
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Construction Waste Management Plan (Template) - Document Control + Change History

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Note:

- *All issues and revisions of this Template are reviewed and approved by the Systems Manager and Director/s*
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CWMP - Document Control and Change History

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All revisions of this Plan are implemented, reviewed and approved by the Project Manager.
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Revision	Date	Description of Revision	Created by	Approved by Project Manager	Approved by Construction Manager
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Contents

1. Introduction 4
1.1 Context 4
1.2 Background 4
1.3 Environmental Management System Overview 6
2. Purpose and objectives 6
2.1 Purpose 6
2.2 Objectives 6
3. Environmental Requirements 6
3.1. Relevant legislation and guidelines 6
i. Legislation 6
ii. Guidelines and Standards 7
iii. Conditions of Approval 7
4. Environmental Aspects and Impacts 9
4.1 Construction waste streams 9
4.2 Impacts 9
5. Waste Management 10
5.1. Waste stream classifications 10
5.2 Definitions 16
5.3. Classification of potential waste streams 17
5.4. Minimising waste 17
5.5. Re-use and recycling 18
5.6. Waste Handling and Storage 18
5.7. Waste Disposal 19
6. Compliance Management 20
6.1. Roles and Responsibilities 20
6.2. Training 20
6.3. Monitoring and Inspections 20
6.4. Non-conformances 20
6.5. Audits 20
6.6. Reporting 20
7. Review and Improvement of the CWMP 20
7.1. Continuous improvement 20
Appendix C 21

1. Introduction

1.1 Context

This Construction Waste Management Plan (CWMP) is a Sub plan of the Construction Environmental Management Plan (CEMP) for the construction of Stage 1B of the Invanhoe Estate development at Macquarie Park in Sydney.

This CWMP has been prepared to address the requirements of the SSD8903 DA consent, and all applicable legislation.

1.2 Background

Frasers Property have awarded Christie Civil the Contract to complete Stage 1B Civil and bridge works to the Ivanhoe Estate project. The concept of Stage 1B is to construct an access road from Stage 1B through to Lyonpark Road. The works involve construction of a curved post tensioned bridge, road and drainage works, access and carpark works to an existing operation building.

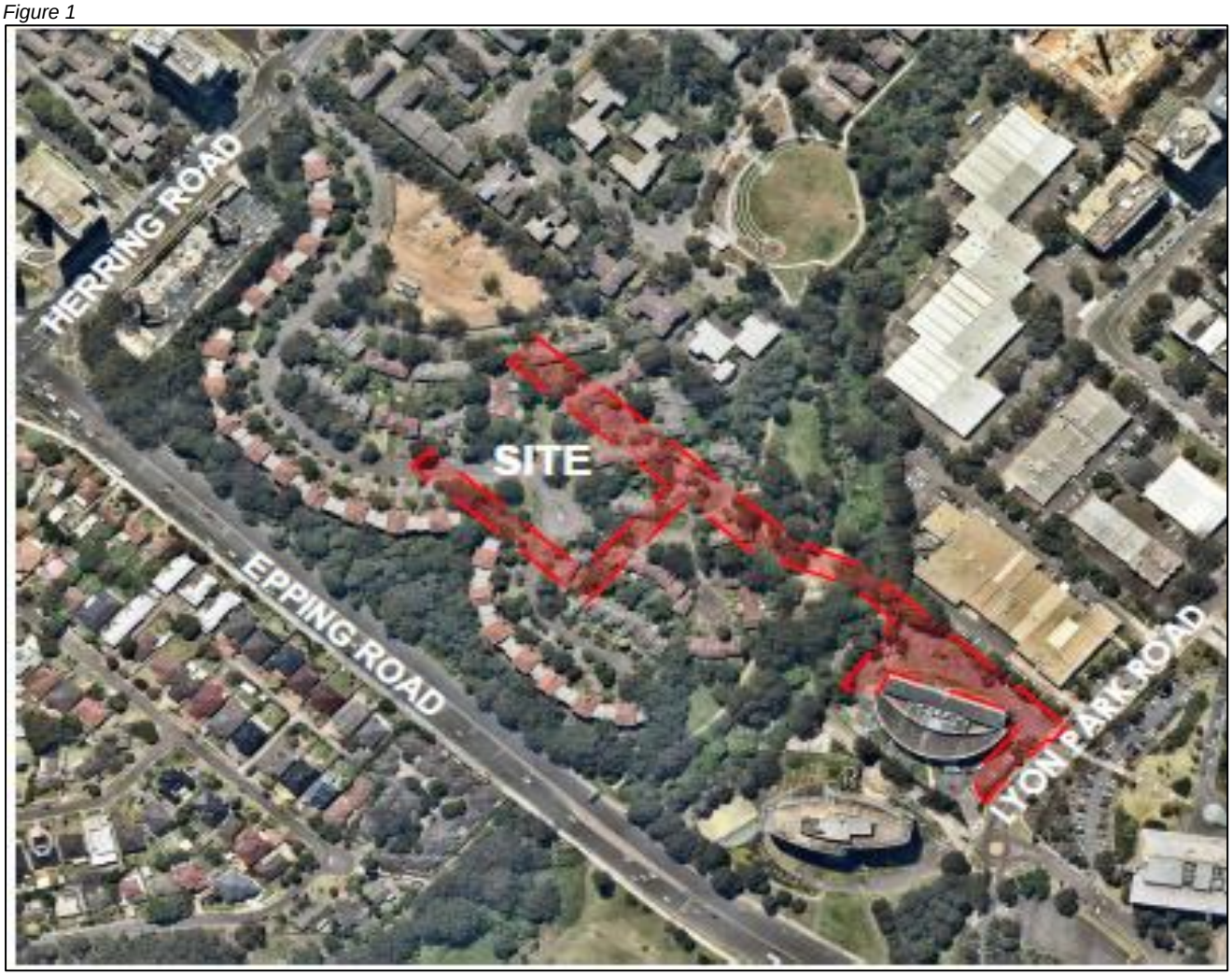
The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping and Herring Roads, within the Ryde Local Government Area (LGA). The site is approximately 8.2 hectares and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. An aerial photo of the site is provided at *Figure 1* below. Immediately to the north of the site are a series of four-storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot that is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment. Epping Road runs along the south-western boundary of the site and Shrimptons Creek, an area of public open space, runs along the south-eastern boundary. Vehicle access to the site is via Herring and Lyonpark Roads. The Ivanhoe Masterplan site incorporates adjoining land, being a portion of Shrimptons Creek and part of the commercial site at 2-4 Lyonpark Road. This land is included to facilitate a bridge crossing and road connection to Lyonpark Road.

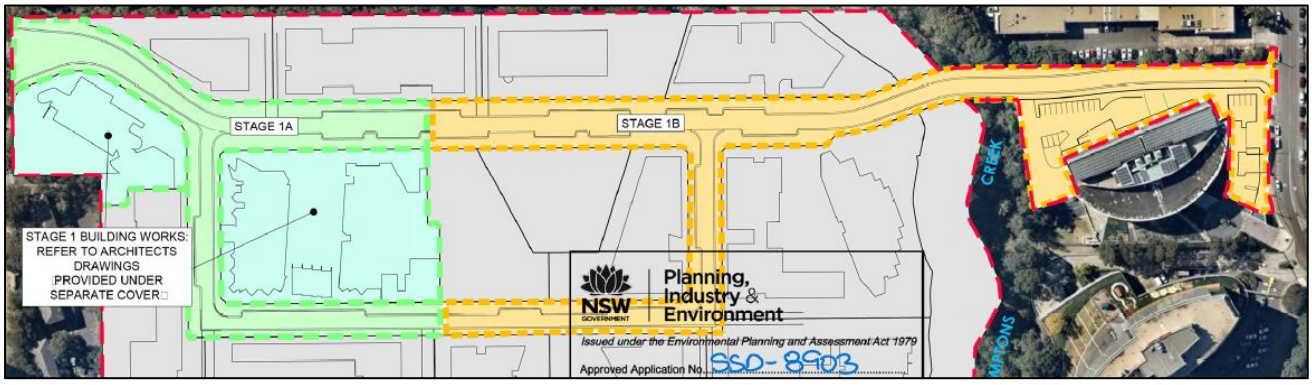
Construction activities include:

- Dilapidation report
- Site clearing
- New driveway entrance to LIF building carpark
- Temporary access over Shrimptons Creek
- 10 Bored piles
- Form, reo, pour abutments, retaining walls, bridge piers
- Falsework to bridge deck
- Form, reo, pour bridge deck
- Post tensioning of bridge deck
- Steel handrails and bike guides
- Street and bridge lighting
- Gabion cladding
- Road construction including
    - Excavation
    - Place basecourse
    - Kerb and gutter
    - Asphalt
    - Linemarking
- Relocation of electrical kiosk
- Electrical works
- Services works
- Stormwater works including GPT
- Paving
- Landscaping

This Waste Management Plan has been prepared to manage the waste generated through these activities.

Figure 1





1.3 Environmental Management System Overview

The overall Environmental Management System for the Project is described in the Construction Environmental Management Plan (CEMP).

The CWMP is part of Christie Civil's environmental management framework for the Project, as described in the CEMP. Management measures identified in this Plan will be incorporated into site or activity-specific Environmental Work Method Statements, where relevant.

Used together, the CEMP, strategies, procedures and other sub management plans form management guides that clearly identify the required environmental management actions for reference by Christie Civil personnel and contractors.

2. Purpose and objectives

2.1 Purpose

This Construction Waste Management Plan describes how Christie Civil proposes to minimise the amount of waste for disposal, maximise recycling, manage waste, and reduce resource consumption during construction of the works.

2.2 Objectives

The key objective of the CWMP is to ensure that waste is minimised, recycling is maximised and all waste is handled appropriately. To achieve this objective, Christie Civil will undertake the following:

- Ensure measures are identified and implemented to minimise waste, manage waste and conserve energy throughout the construction of the project
- Ensure the preferred waste management hierarchy of avoidance, minimisation, reuse, recycling and, finally, disposal is followed
- Provide staff with an increased level of understanding and awareness of waste and resource use management issues
- Ensure appropriate measures are implemented to address the relevant Conditions of Approval
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements
- Eliminate the generation of waste, as a priority
- Recycle and re-use waste that is created on the job
- Use construction methods that allow for de-construction
- Use products and materials that reduce waste

3. Environmental Requirements

3.1. Relevant legislation and guidelines

i. Legislation

Legislation relevant to waste management includes:
• *Environmental Planning and Assessment Act 1979* (EP&A Act).

• *Protection of the Environment Operations Act 1997* (POEO Act).

• Protection of the Environment Operations (General) Regulation 2009.

• Protection of the Environment Operations (Waste) Regulation 2005.

• *Waste Avoidance and Resource Recovery Act 2001* (WARR Act).

• *Contaminated Land Management Act 1997.*

• *National Greenhouse and Energy Reporting Act 2007 (Cth).*

• *Noxious Weeds Act 1993.*

• *Environmentally Hazardous Chemicals Act 1985.*

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in the CEMP.

ii. Guidelines and Standards

The main guidelines, specifications and policy documents relevant to this Plan include:
• *Waste Classification Guidelines Part 1: Classifying waste* (NSW EPA, 2014).

• *Waste Classification Guidelines Part 2: Immobilisation of waste* (NSW EPA, 2014).

• *Waste Classification Guidelines Part 4: Acid sulfate soils* (NSW EPA, 2014).

• *Waste Reduction and Purchasing Policy 2011-2014* (WRAPP), NSW Government.

• *Guidelines on Resource Recovery Exemptions - Land Application of Waste Materials as Fill* (2011, DECCW).

• *Storing and Handling Liquids, Environmental Protection: Participants Manual* (NSW DECC, 2007).

• *National Environment Protection (Assessment of Site Contamination) Measure 1999* (National Environment Protection Council, April 2013).

iii. Conditions of Approval

The requirements of the Project Approval relevant to waste management are detailed in SSD 8903 as detailed in the table below:

Table 1

Conditions relevant to the Waste Management Plan	Condition	Where addressed
B43 d	(d) expedited removal of odorous material from the development to a facility legally able to accept those wastes. All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.	Section 5 Table 5-1, Table 6
B44	B44. Prior to the commencement of any works and prior to the issue of any Crown Building Works for each building, the Applicant must prepare a **Construction Waste Management Plan** (**CWMP**) in consultation with Council. A copy of the plan must be provided to the Certifier. The **CWMP** must include, but is not limited to, the following information:	This CWMP
	(a) the estimated volume or weight of materials that will be reused, recycled or removed from the site;	Section 5 -Table 8
	(b) on-site material storage areas during construction;	Section 5 - Figure 2
	(c) materials and methods used during construction to minimise waste;	Sections 2.2, 5.4

	(d) provide details demonstrating compliance with the relevant legislation, particularly with regard to the removal of asbestos and hazardous waste, the method of containment and control of emission of fibres to the air;	Section 5 – Tables 2,3
	(e) nomination of the end location of all waste and recycling generated from a facility authorised to accept the material type for processing or disposal; and	Section 5 – Tables 2,3
	(f) identification within the **CWMP** of the responsibility for the transferral of waste and recycling bins within the property to the collection point. All requirements of the approved **CWMPs** must be implemented during the excavation and construction of the development.	Section 5 – Tables 2,3
B65	B65 Prior to the commencement of any work, the Applicant is required to satisfy the requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 'asbestos wastes'.	Section 5
C28	C28. Notwithstanding the **CWMP** referred to in **Condition B44**, the Applicant must ensure that:	
	a) all waste generated by the development is classified and managed in accordance with the EPA's *Waste Classification Guidelines Part 1: Classifying Waste 2009*;	Section 5 -Table 2
	b) all waste generated by the development is treated and/or disposed of at a facility that has sufficient capacity to and may lawfully accept that waste;	Section 5 – Table 2
	c) any vehicle used to transport waste or excavation spoil from the site is covered before leaving the premises;	Section 5 – Tables 2,3
	d) the wheels of any vehicle, trailer or mobilised plant leaving the site and cleaned of debris prior to leaving the premises.	Section 5 – Tables 2, 3, 4, 6
C31	C31 Waste materials must be appropriately stored and secured within a designated waste area onsite at all times, prior to reuse or being sent offsite. This includes waste materials such as paper and containers which must not litter the site or leave the site onto neighbouring public or private property. Receipts of all waste/recycling tipping must be retained and produced in a legible form to any authorised officer of the Council who asks to see them.	Section 5 – Tables 2, 3, 4 Sec 5.6
C32	C32 Removal of asbestos and other hazardous building materials must be undertaken by a suitably licensed contractor and an Asbestos Clearance Certificate must be provided before waste classification, disposal or site validation is undertaken.	Section 5 – Table 3

C33	Removal of asbestos and other hazardous building materials must be undertaken by a suitably licensed contractor and an asbestos clearance certificate must be provided before waste classification, disposal or site validation is undertaken.	Section 5 – Table 3
C34	All vehicles involved in the excavation and / or demolition process and departing from the property with materials, spoil or loose matter must have their loads fully covered before entering the public roadway	Section 5 – Tables, 2, 3, 4, 5, 6

4. Environmental Aspects and Impacts

4.1 Construction waste streams

The following construction-related waste streams have been identified:

- Demolition wastes from existing structures that require demolition e.g. skate park, road paving
- Removal of asphalt, concrete, roadbase and services from existing pavement
- Drilling piles for bridge
- Excavation works
- Construction of roads, stormwater and services
- Excess orders of concrete and reinforcing in construction of bridge
- Possible disposal of timber offcuts in formwork
- Waste steel offcuts through construction and assembly of railings
- Vegetation waste generated from clearing and grubbing activities
- Packaging materials associated with items delivered to site such as pallets, crates, cartons, plastics and wrapping materials
- General wastes including office wastes, scrap materials and biodegradable wastes.

4.2 Impacts

The potential environmental impacts associated with construction waste generation include:

• Generation of excavated material for possible disposal
• Generation of general waste in offcuts and over-orders from construction of road and bridge.
• Generation of domestic waste from construction personnel.
• Potential inappropriate disposal of hazardous waste.
• Generation or spread of contaminated waste/soils, e.g. groundwater, used or expired chemicals, or construction materials.
• Water pollution due to wastewater runoff from the earthworks and bridgeworks.

5. Waste Management

5.1. Waste stream classifications

Table 2 - Building and demolition waste (B&D waste)

No.	Checklist	Requirement	Evidence	Note
1	Is any of the waste B&D waste?	If yes: • classify waste onsite using the EPA Waste Classification Guidelines • if the waste is subject to an RRO (Resource Recovery Order) and RRE (Resource Recovery Exemption), all conditions of the RRO and RRE must be complied with.	• waste classification report • any records including sampling results • records required by RRO including sampling results and copies of the statements of compliance	
2	Will the B&D waste be transported offsite?	If yes: • waste tracking requirements apply if waste is generated in the metropolitan levy area (MLA) and transported outside NSW • loads must be covered during transport, wheels of vehicles cleaned of debris before egressing site	• records detailing where material was transported to • tipping register, tipping receipts • transport records (e.g. GPS trackers)	
3	Will the B&D waste be sent for recycling/re-use/processing?	If yes: • receival facility must have planning approval and may require an EPL (Environment Protection Licence) for those waste types	• copy of receival facility's EPL (available on public register), if required. • if no EPL, records showing the facility can receive the waste lawfully e.g. copy of the receival facility's development consent • weighbridge receipts • invoicing and payment receipts from receival facility	Recommended that pay receival facility costs directly to the facility.
4	Will the B&D waste be sent for disposal?	If yes: • disposal facility must have planning approval and may require an EPL to dispose of those waste types.	• copy of disposal facility's EPL (available on public register), if required. • if there is no EPL, evidence demonstrating the disposal facility can receive and dispose of the waste lawfully e.g. copy of the disposal facility's development consent • weighbridge receipts • invoicing and payment receipts from disposal facility.	Recommended that pay receival facility costs, including the waste levy, directly to the facility.

Table 3 - Asbestos waste (including asbestos-contaminated soils)

No	Checklist	Requirement	Evidence	Note
1	Is any of the waste asbestos waste?	If yes: • classify waste onsite using the EPA Waste Classification Guidelines • SafeWork NSW may require written notification of asbestos removal work by a licensed asbestos removalist • you may need a Clearance Certificate under WHS law, to verify that the site is safe for normal use and can be re-occupied.	Evidence Note 1- Is any of the waste asbestos waste? If yes: • classify waste onsite using the EPA Waste Classification Guidelines • SafeWork NSW may require written notification of asbestos removal work by a Licensed Asbestos Removalist • you may need a Clearance Certificate to verify that the site is safe for normal use and can be re-occupied. • waste classification report • any records including sampling results • records of site checks • asbestos audit • copy of SafeWork NSW notification, if required • copy of Asbestos Removalist's Licence • Clearance Certificate	'Asbestos waste' is any waste that contains asbestos, including asbestos contaminated soil.
2	Will the asbestos waste be transported offsite?	If yes: • asbestos sheets must be wrapped • friable asbestos must be in a sealed container • soils contaminated with asbestos waste must be wetted down and covered • loads must be covered during transport • wheels of vehicles cleaned of debris before egressing site • if asbestos waste is >100kg or 10 square metres and being transported in NSW, the consignment must be tracked in WasteLocate • the transporter must use a smart phone or tablet that connects to the internet to record on-road details in WasteLocate • waste tracking requirements apply if asbestos waste > 10 tonnes is transported outside NSW.	• WasteLocate consignment number (audit consignments) or consignment authorisation • transport records (e.g. GPS tracker)	

3	Will the asbestos waste be sent for storage?	If yes: • the receival facility must have planning approval and may require an EPL to store asbestos waste. • the receival facility must have a QR plate to scan for WasteLocate consignment.	• copy of receival facility's EPL (available on public register), if required • if there is no EPL, evidence demonstrating the receival facility can receive and store asbestos waste e.g. a copy of the receival facility's development consent • weighbridge receipts • invoicing and payment receipts from receival facility • tipping register, tipping receipts • WasteLocate consignment number (audit consignments)	Recommended that pay receival facility costs directly to the facility.
4	Will the asbestos waste be sent for disposal?	If yes: • the disposal facility must have planning approval and an EPL to dispose of asbestos waste. • the disposal facility must have a QR plate to scan for WasteLocate consignment.	• copy of disposal facility's EPL (available on public register). • weighbridge receipts • invoicing and payment receipts from disposal facility • WasteLocate consignment number (audit consignments)	Recommended that pay disposal facility costs, including the waste levy, directly to the facility.

Table 4 - Virgin excavated natural material (VENM)

No	Checklist	Requirement	Evidence	Note
1	Is any of the waste VENM?	If yes: • classify waste onsite using the EPA Waste Classification Guidelines.	• waste classification report • sampling results (if available) • geo-tech report (if available)	
2	Will the VENM be transported offsite?	If yes: • waste tracking requirements apply if waste >10 tonnes generated in the MLA is transported outside NSW • loads must be covered during transport • wheels of vehicles cleaned of debris before egressing site	• records detailing where material was transported to • tipping register, tipping receipts • transport records (e.g. GPS trackers)	
3	Will the VENM be sent for reuse or processing?	If yes: • receival facility must have planning approval and may require an EPL to lawfully reuse or process VENM.	• copy of disposal facility's EPL (available on public register), if required • if there is no EPL, evidence demonstrating the disposal facility can dispose of VENM lawfully e.g. a copy of the disposal facility's	Recommended that you pay disposal facility costs, including the waste levy, directly to the facility

			development consent • weighbridge receipts • invoicing and payment receipts from disposal facility • tipping register, tipping receipts.	
4	Will the VENM be sent offsite for disposal?	If yes: • disposal facility must have planning approval and may require an EPL to dispose of VENM.		

Table 5 - Excavated natural material (ENM)

No	Checklist	Requirement	Evidence	Note
1	Is any of the waste ENM?	If yes: • classify waste onsite using the EPA Waste Classification Guidelines • the waste is subject to an RRO and RRE. All conditions of the RRO and RRE must be complied with.	• waste classification report • sampling results • records required by RRO including sampling results and copies of the statements of compliance • geo-tech report (if available)	
2	Will the ENM be transported offsite?	If yes: • waste tracking requirements apply if waste is generated in the metropolitan levy area (MLA) and transported outside NSW • loads must be covered during transport, wheels of vehicles cleaned of debris before egressing site	• records detailing where ENM was transported to • tipping register, tipping receipts • transport records (e.g. GPS trackers)	
3	Will the ENM be sent for reuse?	If yes: • receival facility must have planning approval to re-use the waste.	• Statutory Declaration from owner of receival facility • evidence demonstrating the facility can re-use ENM lawfully e.g. a copy of the receival facility's development consent • invoicing and payment receipts from receival facility, if applicable	Recommended that pay receival facility costs directly to the facility, if applicable.

Table 6 - Excavated material (other than VENM, ENM or asbestos-contaminated soils)

No	Checklist	Requirement	Evidence	Note
1	Is any of the waste excavated material (other than VENM, ENM and asbestos contaminated soil)?	If yes: • classify waste onsite using the EPA Waste Classification Guidelines • if the waste is subject to an RRO and RRE, all conditions of the RRO and RRE must be complied with.	• waste classification report • sampling results • records required by RRO including sampling results and copies of the statements of	Prior to disposal, hazardous waste must be treated to lower its waste classification, either onsite or off-site at a licensed hazardous-waste

			compliance • geo-tech report (if available) • immobilisation approvals	processing facility. Treatment may include immobilisation under an Immobilisation Approval.
2	Will excavated material (other than VENM, ENM and asbestos contaminated soil) be transported offsite?	If yes: • waste tracking requirements apply if: o waste >10 tonnes generated in the MLA is transported outside NSW, or o waste is of a type described in Schedule 1 of the Protection of the Environment Operations (Waste) Regulation 2014 • loads must be covered during transport • wheels of vehicles cleaned of debris before egressing site.	• consignment authorisations and waste transport certificates, if required • records detailing where material was transported to • tipping register, tipping receipts • transport records (e.g. GPS trackers)	
3	Will excavated material (other than VENM, ENM and asbestos-contaminated soil) be sent for re-use or processing?	If yes: • receival facility must have planning approval and may require an EPL to re-use or process those waste types	• copy of receival facility's EPL (available on public register), if required • if there is no EPL, evidence demonstrating the facility can re-use or process the waste lawfully e.g. a copy of the receival facility's development consent • weighbridge receipts • invoicing and payment receipts from receival facility • statutory declaration from owner of receival facility	It's recommended that you pay receival facility costs directly to the facility
4	Will excavated material (other than VENM, ENM and asbestos-contaminated soil) be sent for disposal?	If yes: • disposal facility must have planning approval and may require an EPL to dispose of those waste types.	• copy of disposal facility's EPL (available on public register), if required • if there is no EPL, evidence demonstrating the disposal facility can dispose of the waste lawfully e.g. a copy of the disposal facility's development consent • weighbridge receipts • invoicing and payment receipts from disposal facility	It's recommended that you pay disposal facility costs, including the waste levy, directly to the facility.

5.2 Definitions

Asbestos

The Protection of the Environment Operations Act 1997 (POEO Act) defines asbestos as:

The fibrous form of those mineral silicates that belong to the serpentine or amphibole groups of rock-forming minerals, including actinolite, amosite (brown asbestos), anthophyllite, chrysotile (white asbestos), crocidolite (blue asbestos) and tremolite.

Asbestos waste The POEO Act defines asbestos waste as:

Any waste that contains asbestos.

Building and demolition waste

The POEO Act defines building and demolition waste as:

Unsegregated material (other than material containing asbestos waste or liquid waste) that results from – the demolition, erection, construction, refurbishment or alteration of buildings other than – chemical works, or mineral processing works, or container reconditioning works, or waste treatment facilities, or the construction, replacement, repair or alteration of infrastructure development such as roads, tunnels, sewage, water, electricity, telecommunications and airports, and includes materials such as – bricks, concrete, paper, plastics, glass and metal, and timber, including unsegregated timber, that may contain timber treated with chemicals such as copper chrome arsenate (CCA), high temperature creosote (HTC), pigmented emulsified creosote (PEC) and light organic solvent preservative (LOSP), but does not include excavated soil (for example, soil excavated to level off a site prior to construction or to enable foundations to be laid or infrastructure to be constructed).

Contaminated soil

The POEO Act defines contaminated soil as:

Soil or sediment that contains a substance at a concentration above the concentration at which the substance is normally present in soil or sediment from the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment, where harm to the environment includes any direct or indirect alteration of the environment that has the effect of degrading the environment.

Excavated natural material (ENM)

The resource recovery order ‘Excavated Natural Material Order 2014’ defines, for the purposes of the order, excavated natural material as:

naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has: been excavated from the ground, and contains at least 98% (by weight) natural material, and does not meet the definition of Virgin Excavated Natural Material in the Act. Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

All requirements of the Excavated Natural Material Order 2014 and the related resource recovery exemption ‘Excavated Natural Material Exemption 2014’ must be met for the re-use of excavated natural material to be lawful.

Virgin excavated natural material (VENM)

The POEO Act defines Virgin Excavated Natural Material as:

Matural material (such as clay, gravel, sand, soil or rock fines): that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities and that does not contain any sulfidic ores or soils or any other waste, and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.

5.3. Classification of potential waste streams

The construction aspects and types of wastes, which may be generated during construction, are outlined with classifications in

Table 7- Classification of potential waste streams

Aspect	Waste Types	Classification	Proposed reuse / Recycling / Disposal
Site establishment and compound operation	Waste generated by establishment of the compound	General solid waste (non-putrescible)	Offsite disposal at an approved facility
Domestic waste generated by workers	General solid waste (putrescible)		Offsite disposal at an approved facility / Bins
Excavation works	Spoil	VENM/ENM/GSW	Offsite disposal at an approved facility
Demolition and concrete surface preparation	Concrete / asphalt	Recyclable	Disposal at recycling centre
Asbestos	Asbestos waste	Special waste	Propose to leave within dam wall and encapsulate with concrete / grout, however should disposal be required, it will be offsite at an approved facility

5.4. Minimising waste

We will apply a range of waste minimisation measures throughout the project, including:

Managed Ordering
When ordering materials, we will make every effort to avoid over-ordering, and to reduce wastage from unused materials.

Re-using materials
We will re-use materials wherever feasible. Refer Sec 5.5.

Recycling
We will send materials for recycling, and use recycled materials wherever feasible. Refer Sec 5.5.

Choosing materials carefully
We will also consider how much will end up being wasted in the future. We have a responsibility to ensure we are using materials which will have a long life and that can be easily recycled if and when they need replacing, or the construction is demolished.

Managing hazardous waste
Although the hazardous waste we may encounter during the works was generated in the past and there is nothing we can do to reduce the amounts of these materials now, we can make sure we are aware of them when we come across them and always ensure they are disposed of in the correct way.

5.5. Re-use and recycling

Waste separation and segregation will be promoted on-site to facilitate re-use and recycling as a priority of the waste management program as follows:

Waste segregation onsite – Waste materials, including excavated spoil and demolition waste, will be separated onsite into dedicated bins/areas for either re-use onsite or collection by a waste contractor and transport to offsite facilities.

Table 8 - Forecast of the types and percentages of waste that will be produced:

Material	Estimated waste percentages
General site waste	10%
Timber / formwork	5%
Concrete	10%
Asphalt	5%
Excavated spoil	67%
Steel	3%

5.6. Waste Handling and Storage

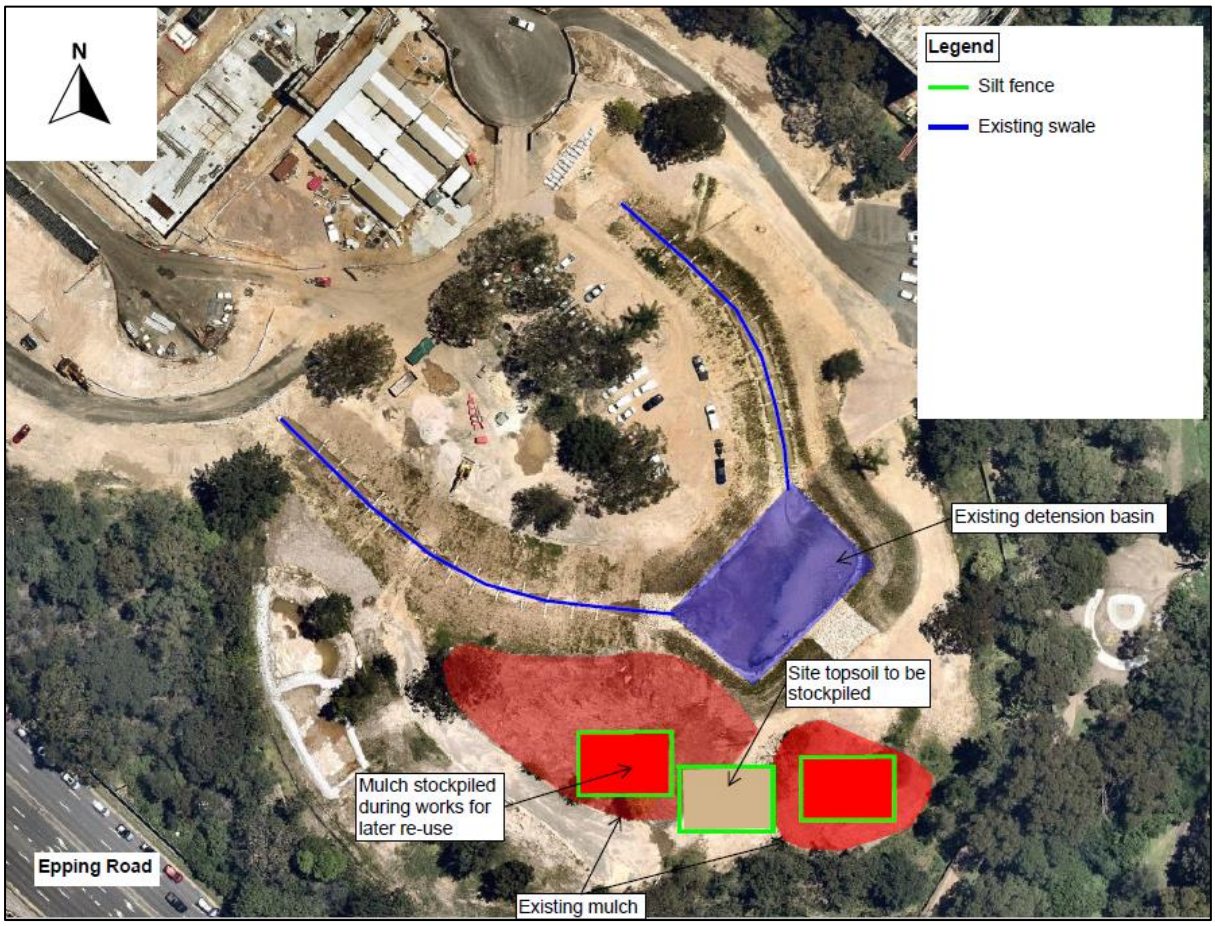
Where waste is required to be handled and stored onsite prior to onsite re-use or offsite recycling/disposal, the following measures apply:

• Spoil, topsoil and mulch are to be stockpiled onsite and mitigation measures for dust control and surface water management will be implemented as per the Air Quality Management Plan and the Soil and Water Management Plan

• Hazardous waste will be managed by appropriately qualified and licensed contractors, in accordance with the requirements of the *Environmentally Hazardous Chemicals Act 1985* and the EPA waste disposal guidelines.

• All other recyclable or non-recyclable wastes are to be stored in appropriate covered receptacles (e.g. bins or skips) in appropriate locations onsite and contractors commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.

Figure 2 - Waste Storage Plan



5.7. Waste Disposal

Waste (and spoil) disposal is to be in accordance with the *Protection of the Environment Operations Act 1997* and the *Waste Avoidance and Resource Recovery Act 2001*. Wastes that are unable to be re-used or recycled will be disposed of offsite to an EPA approved waste management facility following classification.

Where possible, wastes will be removed off-site to a recycling facility or will be disposed of at a licensed waste facility.

Concrete waste is proposed to be sent to a recycling facility and re-used in the project as recycled roadbase

Excavated spoil will be assessed and reused on site where possible.

Details of waste types, estimated volumes and destinations are to be recorded in the Waste Management Register (**Appendix C**).

6. Compliance Management

6.1. Roles and Responsibilities

The organisational structure and overall roles and responsibilities are outlined in the CEMP.

6.2. Training

All employees and contractors working on site will undergo Site Induction training relating to waste management issues. The induction training will address elements related to waste management including:

• Existence and requirements of this sub-plan.

• Relevant legislation.

• Waste management mitigation and management measures.

• Procedure to be implemented in the event of an incident (e.g release of dust or gaseous emissions from site).

6.3. Monitoring and Inspections

Weekly visual monitoring and inspections will be undertaken during construction. Inspections would be undertaken in accordance with the CEMP Annexure A

6.4. Non-conformances

Non-conformances will be managed in accordance with the IPP

6.5. Audits

Audit requirements are detailed in the CEMP.

6.6. Reporting

The Waste Register (**Appendix C**) will be maintained on a monthly basis.

7. Review and Improvement of the CWMP

7.1. 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 waste log and waste plan should be reviewed monthly for effectiveness and possible improvements.

Appendix C

Waste Management Register

Date / Time	Waste Classification	Description of waste (e.g. concrete, asphalt, vegetation)	Amount of spoil or waste collected	Transporter	Facility to receive	Waste Use (Reuse, Recycled, Stockpiled or disposed)	Invoice No / Tip Docket Ref

APPENDIX 11

Biodiversity Management Plan BMP

Biodiversity Management Plan BMP

SSD 8903 Condition B47

Ivanhoe Estate
Stage 1B Civil Works
Epping & Lyonpark Roads
Macquarie Park
NSW 2113

Date: 22/02/22
Rev: A

Biodiversity Management PlanTemplate - Document Control + Change History

Document Controller	**Systems Manager**
Document Location	**Christie Civil server**
Document Name	**SOPF 5.23 Biodiversity Management Plan (Template)**

Issue / Revision	Date	Description of Revision	Approved by
A	10/01/20	Initial Issue	S Gormlie

Note:

- *All issues and revisions of this Template are reviewed and approved by the Systems Manager and Director/s*
- *This is a Christie Civil office server-controlled document – printed copies of this document are uncontrolled*

BMP - Document Control and Change History

Document Controller	**Project Manager**
Document Location	**Christie Civil office server**
Document Name	**Biodiversity Management Plan – Ivanhoe Estate – Stage 1B Civil Works**

All revisions of this Plan are implemented, reviewed and approved by the Project Manager.
The Project Manager is responsible for ensuring correct management of superseded versions and archiving on the Christie Civil server.

Revision	Date	Description of Revision	Created by	Approved by Project Manager	Approved by Construction Manager
A	**22/02/22**	Initial Issue	Michael Fitzgerald	Travis McCleary	Martin Carey

Contents

1. Biodiversity plan 5

2. Measures to minimise impacts 7

3. Minimising indirect impacts during construction 8

References 9

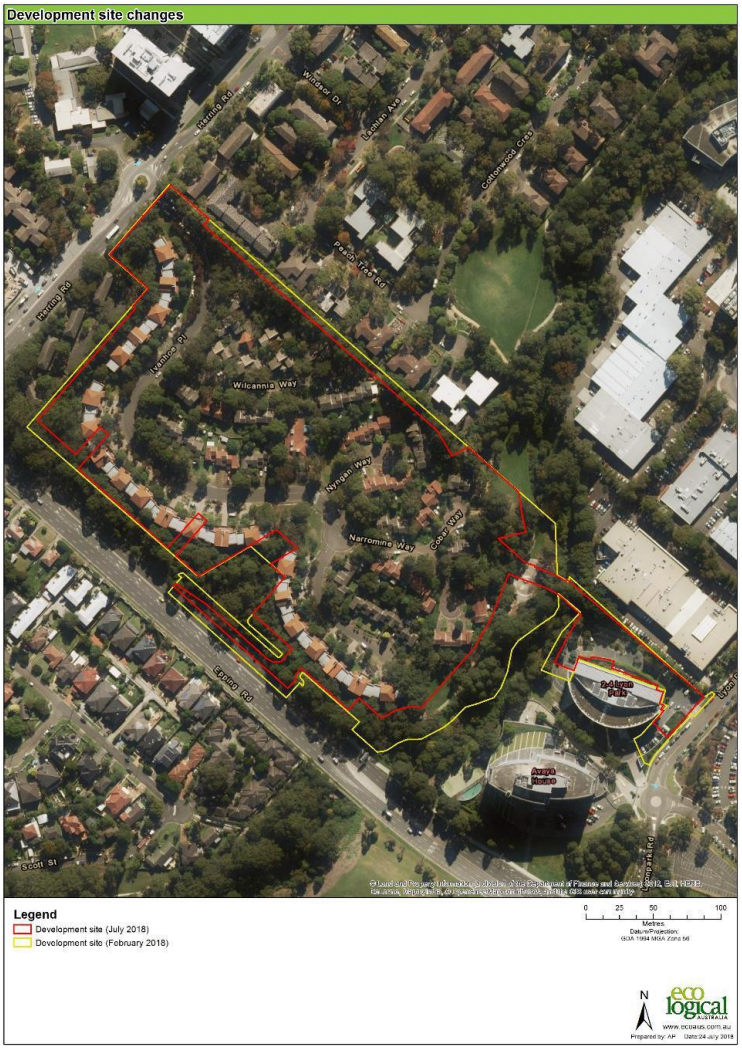
Commonwealth legislation 9

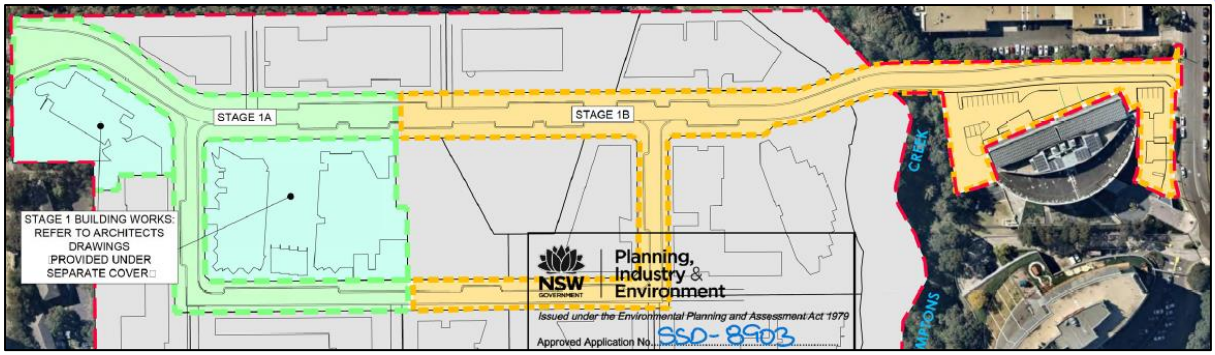
1. Biodiversity plan

Frasers Properties have awarded Christie Civil the Contract to complete Stage 1B Civil and bridge works to the Ivanhoe Estates project at Macquarie Park. The concept of stage 1B is to construct an access road from stage 1B through to Lyonpark Road. The works involve construction of a curved post tensioned bridge, road and drainage works, access and carpark works to an existing operation building.

The Ivanhoe Estate site is located in Macquarie Park near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). The site is approximately 8.2 hectares and currently accommodates 259 social housing dwellings, comprising a mix of townhouse and four storey apartment buildings set around a cul-de-sac street layout. An aerial photo of the site is provided at Figure 1 below. Immediately to the north of the site are a series of four storey residential apartment buildings. On the north-western boundary, the site fronts Herring Road and a lot that is currently occupied by four former student accommodation buildings and is likely to be subject to redevelopment. Epping Road runs along the south-western boundary of the site and Shrimptons Creek, an area of public open space, runs along the south-eastern boundary. Vehicle access to the site is via Herring Road and Lyonpark Road. Ivanhoe The Masterplan site incorporates adjoining land, being a portion of Shrimptons Creek and part of the commercial site at 2-4 Lyon park Road. This land is included to facilitate a bridge crossing and road connection to Lyon park Road.

The works area is effectively bounded by Herring / Epping and Lyonpark Roads in Macquarie Park, Sydney.





The scope of this contract involves construction of Stage 1B as shown in the sketch above.

This Biodiversity plan has been produced to identify risks and manage those risks for the construction of stage 1B. This document is based on Eco logical Australia report September 2018.

Stage 1B can be identified in three sections:

- Area West of proposed bridge
- The Shrimptons creek bridge
- The area East of the bridge

The area West of the bridge has been cleared in a previous stage of the project so there is very little biodiversity impact in this area. The area East of the bridge is made up of existing pavement so works in this area have very little biodiversity impact. Most of the potential impact is in the footprint of the new bridge over Shrimptons creek. This creek is classed as a second order stream, and is highly impacted by adjacent development. Shrimptons Creek flows northwards underneath a shopping centre, then continues for approximately 1.3 km where it meets the Lane Cove River. Shrimpton Creek, and the Lane Cove River occur within the outer assessment circle and have been identified as a 2nd order and 5th order streams, respectively.

The activities involved with the construction of the new bridge are:

- Clearing works either side of the creek up to the abutments
- Construction and eventual removal of a temporary access way across the creek to the South of the proposed bridge.
- Possible temporary filling of the creek to create a foundation platform for the falsework of the bridge deck.
- Platforms for piling rigs and cranes
- Piling works
- Form, reo, pour works
- Construction of the concrete bridge deck
- Bridge finishing works including railing and paving
- Installation of rock scour protection on embankments and enhancing riparian zone of the creek.
- Form, reo, pour works
- Construction of the concrete bridge deck
- Bridge finishing works including railing and paving
- Installation of rock scour protection on embankments of the creek.

2. Measures to minimise impacts

Christie Civil will implement measures to minimise the impacts of the projects during both the construction and operational phase. It is noted that this BMP is to be read in conjuction with the following Project documents:

- Construction Environmental Management Plan
- Construction Soil and Water Management Plan
- Noise and Vibration Management Plan
- Construction Pedestrian and Traffic Management Plan
- Air Quality and Odour Management Plan

Details of measures to minimise impacts during the construction and operational phase are described below.

Measures to minimise impacts during construction phase

Several considerations were given to minimising impacts to biodiversity during the construction phase of the project. These are detailed below in **Table 1**.

Table 1: Minimisation of impacts through during the construction phase

Matter considered to minimise impacts	Adopted matters within development site
Minimising clearing area	No clearing is to be undertaken until Frasers Property and an external arborist define the area to be cleared and identify what trees and vegetation are to be removed / retained.
Method of clearing – using a method of clearing during the construction phase that avoids damage to retained native vegetation and reduces soil disturbance. For example, removal of native vegetation by chain-saw, rather than heavy machinery, is preferable in situations where partial clearing is proposed	Vegetation that is to be removed adjacent to retained vegetation will be removed using chain-saw rather than heavy machinery to avoid any additional impacts of the project.
Clearing operations – minimising direct harm to native fauna during actual construction operations through onsite measures such as undertaking pre-clearing surveys, daily fauna surveys and the presence of a trained ecologist during clearing events	Clearing of vegetation will be undertaken via a two stage clearing process. Clearing will not be undertaken until a pre-clearance assessment is conducted and the results communicated by qualified ecologists. Ecologists will be present for all vegetation clearing. Stage 1 of the clearing process involves marking of habitat features, and removal of all vegetation except habitat features. Stage 2 involves removal of habitat features under the supervision of ecologists to relocate resident fauna. A detailed methodology of the two-stage clearing process will be included within the BMP. All clearing staff will be briefed about the two-stage clearing process, and their responsibilities to minimise impacts to biodiversity.
Timing of construction – identifying reasonable measures that minimise the impacts on	Timing of construction will not mitigate any impacts to biodiversity. The development site is

biodiversity. For example, timing construction activities for when migratory species are absent from the site, or when particular species known to or likely to use the habitat on the site are not breeding or nesting, can minimise the impacts of construction activities on biodiversity	occupied by limited fauna species and as such there is no specific timing constraints of the project.
Other measures that minimise inadvertent impacts of the Major Project on the biodiversity values – measures such as installing temporary fencing to protect significant environmental features such as riparian zones, promoting the hygiene of construction vehicles to minimise spread of weeds or pathogens, appropriately training and inducting project staff and contractors so that they can implement all measures that minimise inadvertent adverse impacts of the Major Project on biodiversity values.	Other measures to minimise the impacts of the project on biodiversity will be detailed within the CEMP. These measures will include at a minimum: • Temporary fencing to delineate clearing boundaries • Marking of trees for retention within open space areas • Cleaning of mobile plant prior to works to prevent the spread of weeds and pathogens • Sediment controls along Shrimptons Creek to prevent impacts downstream • Signage within the works area to advise contractors of responsibilities

3. Minimising indirect impacts during construction

In addition to the controls identified above, the following management actions will be undertaken to minimise indirect impacts during construction, as shown in **Table 2**.

Table 2: Minimisation of indirect impacts

Indirect impact	Method to avoid indirect impact
Sedimentation and run-off – sediment barriers or sedimentation ponds to minimise impacts of the Major Project on biodiversity values on land that is adjoining the development site, and waterways downstream of the development site	Installation of sediment barriers, sediment ponds, stormwater management systems, delineation of works zones
Noise, dust or light spill – adopting onsite measures that can minimise the impacts on biodiversity values from noise, dust or light spill during the construction phase. For example, only undertake construction during daylight hours to avoid impacts from light spill where this may be detrimental to species habitat on adjoining lands	Construction works are to occur during daylight hours only
Inadvertent impacts on adjacent habitat or vegetation – considering measures such as retaining vegetation on the development site as a buffer to protect significant environmental features (e.g. riparian zones, likely or known threatened species habitat)	Temporary fencing to be installed prior to works, to delineate boundaries and protect retained vegetation
Feral pest, weed and/or pathogen encroachment into vegetation on land adjoining the development site – one example is using	A weed management plan will be included within the BMP for the development site which

protocols for hygiene that minimise the likelihood of construction vehicles spreading weeds or pathogens from the development site into native vegetation on land adjoining the development site	will include cleaning and inspection of light vehicles and mobile plant
Impacts that are infrequent, cumulative or difficult to measure – where there are likely to be indirect impacts on biodiversity that are infrequent, cumulative or difficult to measure over time, consideration should be given to how an operational monitoring program can be used to assess the timing and/or extent of these impacts. A proposal for an operational monitoring program should be set out in the BAR. Development of a monitoring program may involve determining the base-line information that will be necessary to measure the impact over time. It should also consider how the results of the monitoring program could be used to inform ongoing operations in order to reduce the extent of indirect impacts	A monitoring program will be drafted within the BMP to measure infrequent and cumulative impacts of the project. The monitoring program will include baseline data capture to measure any effects of the project over time.
Impacts during the operational phase – measures to avoid or minimise the indirect impacts on threatened species and threatened species habitat on land adjoining the development site, migratory species or flight pathways as a result of the operation of the development. Such measures may include those adopted to avoid and minimise: (i) trampling of threatened flora species (ii) rubbish dumping (iii) noise (iv) light spill (v) weed encroachment (vi) nutrient run-off (vii) increased risk of fire, and (viii) pest animals.	There are no threatened flora species within the development site Fences will be placed around key biodiversity areas to prevent rubbish dumping. Appropriate security measures will also be in place to reduce illegal dumping Post construction, noise impacts are unlikely to be increased from the current levels experienced by the development site and adjacent land Light spill will be managed by directing street lighting away from retained vegetation Weed encroachment, and nutrient run off will be managed by a weed management plan within the BMP, and sediment and stormwater controls within the CEMP

References

NSW Planning and Assessment Act 1979
Project consent SSDA8903
Eco logical Australia report September 2018
NSW Biodiversity Conservation Act 2016
NSW Threatened Spieces Conservation Act 1995
NSW Biodiversity Conservation (Savings and Transitional) Regulation 2017

Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999
Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy

APPENDIX 12

Asbestos Management

CHRISTIE CIVIL

A.B.N. 74 096 455 346

25/03/2022

Fraser Property Australia
Level 2,
1C Homebush Bay Drive,
Rhodes NSW 2138 Australia

For the attention of:- Mr Chris Koukoutaris

Dear Sir,

IVANHOE ESTATE - DEVELOPMENT CONSENT SSDA 8903
CONDITION B64 & B64

B64. The Applicant shall comply with any notification requirements to SafeWork NSW concerning the handling and removal of any asbestos.

B65. Prior to the commencement of any work, the Applicant is required to satisfy the requirements of the *Protection of the Environment Operations (Waste) Regulation 2014* with particular reference to Part 7 *'asbestos wastes'*.

In accordance with Development Consent SSDA 8903 Condition B64 & B65 it should be noted that Environmental Earth Sciences have provided a clearance certificate for the Ivanhoe Estate site. However in the event that asbestos is found on site, it will be treated as an unexpected find as documented in our Integrated Management Plan.

We can confirm that Christie Civil will comply with all notification requirements to SafeWork NSW concerning the handling and removal of any asbestos.

Christie Civil further confirm that should asbestos waste be discovered on site, we will comply with the requirements of the Protection of the Environment Operations (Waste) Regulation 2014 with particular reference to Part 7 – Transportation and Management of Asbestos Waste.

Yours Faithfully
Christie Civil Pty Limited

Colin Cartwright
Ph:- 0414 805 715
E-mail:- colin.cartwright@christiecivil.com.au

Asbestos Management Plan

SSD 8903 Conditions B64,B65,C19,C20,C21,C32,C33

Ivanhoe Estate
Stage 1B Civil Works
Epping & Lyonpark Roads
Macquarie Park
NSW 2113

Date: 22/03/22
Rev: A

Document Control and Change History

Document Controller	**Systems Manager**
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Document Name	**SSPF1 - Asbestos Management Plan**

Issue	Date	Description of Revision	Approved By
A	March 2012	Initial Issue to comply with new WHS legislation	Scott Richardson
B	August 2021	Update to current requirements	S Gormlie / Systems Manager

Note:

- *All issues and revisions of this Template are reviewed and approved by the Systems Manager*
- *Current version is available on the Christie Civil server*

Project Asbestos Management Plan - Document Control and Change History

Document Controller	**Travis McCleary**
Document Location	**Master File (Christie Civil office server / Procore)**
Document Name	**Ivanhoe Estate – Stage 1B Civil Works - Asbestos Management Plan**

All revisions of this Plan are implemented, reviewed and approved by the Project Manager. The Project Manager is responsible for ensuring correct management of superseded versions and archiving on the Christie Civil server.

Revision	Date	Description of revision	Prepared by	Approved by Project Manager
A	**22/03/22**	Initial issue	Susan Gormlie	Travis McCleary

Contents

1.Introduction 4
2. Definitions 5
3. Health Implications Associated with Asbestos 7
4. Identification of Asbestos or ACM 8
5. Asbestos Management in the Workplace 10
a. Asbestos or ACM Identification 10
b. Asbestos Removal – General Procedure 12
6. Emergency and Incident Procedure 13
7. Worker Responsibilities 14
8. Asbestos Management Plan and Register Review 15
Appendix A - Asbestos Register 16
Appendix C – Site Plan 18
Appendix D – Incident Report Form 19
Appendix E – Emergency Response Plans 20

1.Introduction

Christie Civil is a medium-sized civil contractor undertaking various projects of differing types on a continual basis throughout New South Wales. A large proportion of these projects involve activities associated with earthworks, bringing with them a subsequently elevated risk that man-made and naturally occurring asbestos will be encountered during these works.

Christie Civil has a legal obligation under the Work Health and Safety Act (NSW) 2011 and Regulation (NSW) 2017 to provide a safe work place for all workers. Christie Civil also has an obligation to ensure that its activities do not adversely affect the health and safety of others.

The purpose of this Asbestos Management Plan is to address Christie Civil's legal obligations under *Chapter 8 of the WHS Regulation (NSW) 2017* and the requirements of the *Protection of the Environment Operations (Waste) Regulation (NSW) 2014, Part 7 - Asbestos waste*, in relation to the presence of asbestos or ACM on its project sites.

The plan has been established to ensure that the safety and health of all workers, subcontractors, visitors and other parties is maintained, and is to be read in conjunction with any previously existing asbestos survey reports or other site-related asbestos information.

2. Definitions

Airborne asbestos:	Any fibres of asbestos small enough to be made airborne. For the purposes of monitoring airborne asbestos fibres, only respirable fibres are counted.
Asbestos:	The fibrous form of those mineral silicates belonging to the serpentine or amphibole groups of rock-forming minerals, including actinolite, amosite (brown *asbestos*), anthophyllite, chrysotile (white *asbestos*), crocidolite (blue *asbestos*) and, tremolite, or any mixture containing one or more of the mineral silicates belonging to the serpentine and amphibole groups.
Asbestos-containing material (ACM):	Any material, object, product or *debris* that contains *asbestos*.
Asbestos Register:	A register recording the date on which the asbestos or ACM was identified and the location, type and condition of the asbestos or ACM. Alternatively, the register is to state that no asbestos or ACM is identified at the workplace.
Asbestos Related Work:	*W*ork undertaken in connection with a work process in which exposure to *asbestos* may occur and includes any work process involving the use, application, removal, mixing or other handling of *asbestos* or *asbestos containing material*.
Asbestos Removalist:	A person conducting a business or undertaking who carries out asbestos removal work.
Bonded or non-friable asbestos material :	Materials that contain asbestos in a bonded matrix (may consist of Portland cement or various resin/binders) and cannot be crushed by hand when dry.
Competent person:	A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill, for the safe performance of the specific work.
Control Level:	The airborne concentration of a particular substance which, if exceeded, indicates a need to implement a control, action or other requirement. Control levels are generally set at no more than half the national exposure standard for the substance. Control levels are occupational hygiene 'best practice', and are *not* health-based standards
Control Monitoring:	Means air monitoring, using static or positional instrumentation to measure the level of airborne asbestos fibres in an area during work on ACM. Control monitoring is designed to assist in assessing the effectiveness of control measures. Its results are not representative of actual occupational exposures, and should not be used for that purpose.

Dust and debris:	*V*isible particles, fragments or chunks of material, large and heavy enough to have settled in the work area, that are likely to have originated from ACM.
Friable Asbestos:	ACM which, when dry, is/may, become crumbled, pulverised or reduced to powder by hand pressure NOTE: This may include ACM that have been subjected to conditions that leave them in a state where they meet the definition, such as weathering, physical damage, water damage etc. Hierarchy of hazard control measures are taken to minimise risk to the lowest level reasonably practicable in the descending order of elimination, substitution, engineering controls, administrative controls, and PPE.
Licence:	A licence granted by the SafeWork NSW to carry on the business of *licensed work* under the WHS Regulation, 2017.
Licensed work:	Means work carried out under a licence, as follows: 1. *Class A Licence* – can remove any amount or quantity of asbestos or ACM, including i. any amount of friable asbestos or ACM ii. any amount of ACD iii. any amount of non-friable asbestos or ACM 2. *Class B Licence* – Can remove any amount or quantity of non-friable asbestos or ACM and any amount of ACD associated with the removal of non-friable asbestos or ACM 3. *No Licence Required* – Can remove up to $10m^2$ of non-friable asbestos or ACM and ACD.
Person with control:	Means, in relation to premises, a person who has control of premises used as a workplace. The person with control may be: i. The owner of the premises; ii. A person, who has, under any contract or lease, an obligation to maintain or repair the premises; iii. A person who is occupying the premises; iv. A person who is able to make decisions about work undertaken at the premises; or v. An employer at the premises.
Naturally occurring asbestos (NOA):	The natural geological occurrence of asbestos minerals found in association with geological deposits including rock, sediment or soil.
NOHSC:	National Occupational Health & Safety Commission, now known as the Australian Safety & Compensation Council (ASCC).
Respirable asbestos:	Is an asbestos fibre that: a. is less than 3 microns (µm) wide b. more than 5 microns (µm) long c. has a length to width ratio of more than 3:1.

3. Health Implications Associated with Asbestos

The inhalation of airborne asbestos fibres has been medically proven to cause and/or induce major medical diseases. The three most common forms of asbestos disease include:

1. **Asbestosis:**

Asbestosis is a chronic chest disease that is caused by inhalation of high concentrations of asbestos fibres. The condition can develop 10 to 20 years after initial exposure. Asbestos fibres initially damage cell membranes in the lungs and, as a result, the lung tissue becomes hardened and scars.
Shortness of breath after exercise is usually the first symptom of asbestosis. Other symptoms include persistent coughing, chest pain, phlegm, lung infections, pulmonary hypertension and heart failure.
Early abnormalities of asbestosis are difficult to detect in a lung X-ray, however, as the disease progresses the X-ray is characterised by a cloudy, ground glass appearance.

2. **Lung cancer:**

Lung Cancer of the bronchial tubes, lungs and alveoli can develop after exposure to asbestos. Those who have been exposed to asbestos and who have smoked run a much greater risk of getting lung cancer.
An irritative cough with increasing sputum is the first symptom of lung cancer, followed by blood-tinged sputum, coughing up blood, chest pains and chest infections.

3. **Mesothelioma**

Mesothelioma is a cancer of the lung lining. It can result from low-level exposure to asbestos and can take 30 to 45 years to develop after initial exposure. It is an aggressive and painful cancer, and sufferers rarely live longer than 12 to 18 months.
A dull, aching chest pain and shortness of breath are the early symptoms, followed by abdominal pain, abdominal swelling and loss of weight.

4. Identification of Asbestos or ACM

Due to the nature of work that Christie Civil is involved in, asbestos encountered during works is in-ground and generally is the result of previous demolition works within the area. The asbestos can take the form of either friable or non-friable asbestos or ACM.

In accordance with Development Consent SSDA 8903 Condition B64 & B65, it should be noted that Environmental Earth Sciences have provided a clearance certificate for the Ivanhoe Estate site.
However, in the event that asbestos is found on site, it will be treated as an unexpected find.
Christie Civil will duly comply with all notification requirements to SafeWork NSW concerning the handling and removal of any asbestos. Should asbestos waste be discovered on site, we will comply with the requirements of the *Protection of the Environment Operations (Waste) Regulation (NSW) 2014* with particular reference to *Part 7 – Transportation and Management of Asbestos Waste*.

Before works commence on the job site, Christie Civil will take a number of soil samples to enable classification of the type of soil and any contaminants present. This survey will often identify if any asbestos or asbestos containing materials are present. If asbestos is identified, a procedure will be implemented to ensure that the asbestos and/or ACM is safely and legally removed. This procedure is discussed in section seven of this plan.

Whilst initial testing is undertaken and a clearance issued to commence works, the possibility still remains for asbestos or ACM to be uncovered during works. Christie Civil employees have been trained and obtained certification in Asbestos Awareness, and so are able to provide a competent evaluation as to whether materials uncovered are asbestos or ACM.

When a material, dust, debris, powder or similar substance suspected of containing asbestos is identified, works in that area will cease immediately. A sample shall be taken by a competent person who has received training and certification for working with asbestos. Samples shall be placed in an airtight container, be appropriately labelled and immediately dispatched for analysis. The sample, if taken by a competent Christie Civil employee, is to have the following information attached to enable efficient and effective remedial actions to be implemented:

1. Name and location of the earth, structure, plant or equipment from which the sample was taken
2. Exact location of the sampled material from the SSPF15 - Asbestos Register
3. Date of sampling
4. Lot identification number (if applicable)
5. Name and telephone number of the person who took the sample

Analysis of the sample is to be carried out by a certified Hygienist accredited by the National Association of Testing Authorities (NATA). Works are not to commence in the area in which potential asbestos was identified until the Hygienist has advised that no asbestos or ACM were present in the sample. If asbestos or ACM were identified in the sample, a procedure is to be implemented, as per section seven of this plan to ensure that the asbestos is removed safely and a Clearance Certificate issued prior to works re-commencing.

Any materials identified as possibly containing asbestos are to be recorded on an Asbestos Register. The Asbestos Register is to contain the following information:

- The date on which the possible asbestos or ACM was identified
- The location, type and condition of the potential asbestos or ACM
- The competent person identifying the sample
- Any presumption made
- The result of the sample analysis undertaken (if applicable)

The Asbestos Register is to be reviewed and revised if necessary by a competent person on a minimum five yearly basis, or whenever one of the following occurs:

- the Asbestos Management Plan is reviewed
- further asbestos or ACM is identified at the workplace
- asbestos is removed from or disturbed, sealed or enclosed at the workplace

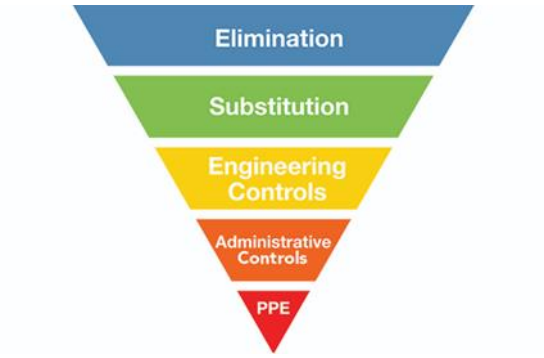
Rather than submitting a material suspected of containing asbestos for analysis, it may be presumed and stated that the material is asbestos or ACM.
From this point forward, the material must be treated as asbestos until it is removed and a clearance certificate issued, or the sample is proven not to be asbestos.

5. Asbestos Management in the Workplace

a. Asbestos or ACM Identification

When asbestos or ACM is encountered in the workplace, a risk analysis is to be carried out to define the hazards, associated risk rating, the controls that can be implemented to eliminate or minimise the risks, and establish the residual risk rating.

The analysis is to be carried out by a competent person, and the controls identified should strive to be in line with the hierarchy of control. The hierarchy of control aims to eliminate the risk in the first place, and works down through controls to PPE:



Depending on the risks identified, a combination of the above control methods may be required to adequately control and manage the asbestos or ACM hazard.

There are four main methods by which asbestos will be managed:

1. *Leave and Monitor* – can be used when asbestos or ACMs are stable and not prone to damage
2. *Encapsulate/seal* – can be used on asbestos or ACMs that are stable but have elements that are prone to damage. Encapsulating/sealing is a surface treatment that forms a barrier over the damage-prone areas. This method cannot be used if it will create significant disturbance to the asbestos fibres
3. *Enclosure* – can be used on relatively stable asbestos or ACM that have elements that are prone to damage. This method involves containing the asbestos within a sealed area
4. *Removal* – can be used on unstable asbestos or ACM that is prone to damage. This method completely eliminates the hazard but is often not economically viable

Due to the nature of projects undertaken by Christie Civil, most asbestos or ACM encountered takes one of two forms:

1. Earth material containing bonded asbestos contaminants
2. Older buried materials made with or containing bonded asbestos (e.g. pipe lagging, asbestos sheets, etc.)

In both of the above scenarios, the aim of the Christie Civil work process is to remove the asbestos or ACM, providing that it is of the bonded form. For any asbestos or ACM encountered that is suspected to be friable, a certified asbestos Hygienist will be consulted and subcontracted to undertake the removal works.

A SWMS has been developed to control and eliminate/minimise the risks associated with these work processes, and is attached in **APPENDIX B**. The SWMS is to be reviewed and modified to suit specific site conditions and should be thoroughly analysed for suitability prior to implementation.

Christie Civil employees have undertaken Asbestos Awareness Training, to enable competent identification of potential asbestos or ACM. In addition to asbestos awareness training, a number of employees have also completed both bonded and friable asbestos removal courses at Registered Training Organisations.

This training gives all employees a basic understanding of how asbestos can be identified, the health implications associated with asbestos or ACM, and how these risks can be managed. All staff are consulted during the development of the risk analysis and also during the development of the subsequent SWMS, if applicable.

For each project where asbestos or ACM are confirmed to be present, a site plan showing the location of all major aspects of the site specific management plan is to be attached in **APPENDIX C**

b. Asbestos Removal – General Procedure

Following is a general procedure for the removal of bonded asbestos or bonded ACM after potential identification on-site. This procedure is intended as a guide only; it is important that site conditions and the job to be undertaken are reviewed through the use of a risk analysis. All hazards and controls are to be incorporated into the SWMS developed for the task.

1. All workers on site are to be inducted by Christie Civil and Client (if applicable) prior to commencing any works on site. Workers qualifications and details shall be recorded as per standard Christie Civil operating procedures
2. All workers to be inducted into relevant SWMS prior to undertaking the related task
3. Stop works in area in which asbestos was identified
4. Boundaries of contamination to be established by competent person
5. Contaminated area to be isolated using visual delineation (e.g. plastic barrier boards, star pickets and bunting, etc.) to prevent unauthorised access to area
6. Warning signage to be erected, conforming to AS 1319, to identify presence of asbestos in the area
7. Sample of material to be taken by a trained, component person. Sample to be sent to NATA certified laboratory for testing and analysis
8. Record find on Asbestos Register, including results of testing

The following steps are to be followed if a positive test result is returned:

9. Perform a site-specific risk analysis and develop appropriate SWMS, detailing controls and measures; implement controls identified
10. If bonded asbestos to be removed is greater in surface area than $10m^2$, ensure a Class B, Bonded Asbestos Removal licence is held
11. All personnel involved in removal to be inducted into specifically developed SWMS
12. All personnel to be issued with PPE, as determined in SWMS, prior to entering contaminated area. All Contaminated PPE to be decontaminated or disposed of as asbestos contaminated waste prior to exiting contaminated zone
13. Asbestos and ACM to be removed and placed into truck containers double-lined with minimum 200µm thickness, new, non recycled plastic sheeting
14. Once trucks have a full payload, and prior to exiting contaminated area, asbestos waste to be sealed within plastic sheeting
15. Water misting is to be used as required throughout removal operations to ensure dust is suppressed
16. No high speed abrasive or pneumatic tools to be used during removal operations
17. Trucks, plant and machinery exiting removal zone are to be decontaminated prior to exit
18. All waste to be disposed of at a licensed asbestos waste disposal site and recorded on Truck Tipping Register
19. Personnel involved in removal are to ensure all machinery, tools and PPE is disposed of and/or cleaned prior to exiting removal zone. Any water, rags or other materials used during clean-up are to be treated and disposed of as asbestos containing materials in sealed, minimum 200µm thickness, new, non-recycled plastic bags
20. After completion of removal works, accredited Hygienist is to issue a Clearance Certificate prior to the removal of any barriers, signage or other controls
21. Upon receipt of the Clearance Certificate, barriers and signage are to be removed and normal works to recommence

6. Emergency and Incident Procedure

All asbestos or ACM incidents occurring onsite are to be recorded on SSPF12 - Work Related Incidents, attached in **APPENDIX D**. This report clearly defines the incident that occurred, the specific details, and any remedial actions required.

All asbestos or ACM material incidents or emergencies are also to be included in the site Asbestos Register.

Emergencies involving asbestos can be split into two main categories:

1. Air monitoring devices return a reading of higher than 0.1 fibres/ml
2. Suspected asbestos or ACM material is uncovered onsite

Christie Civil has developed an emergency response plan for each scenario, which can be viewed in

APPENDIX E.

These response plans are to be implemented as soon as reasonably practicable after the incident or emergency has occurred.

7. Worker Responsibilities

Christie Civil senior management is ultimately responsible for ensuring that this Asbestos Management Plan is being properly implemented and maintained on site, however, they will predominantly rely on feedback from the site management staff to ascertain if this is taking place.

Whilst the monitoring of the plan is senior management responsibility, site employees must also be committed to working in accordance with this plan to ensure its full and efficient implementation. It is important that consultation between management and workers takes place throughout development and implementation of this plan to ensure this goal is achieved.

Specific Christie Civil management responsibilities include the following:

- Provide and maintain, so far as practicable, safe and healthy work environments and practices generally, and have written policies on the control of asbestos
- Comply with legislative provisions
- Liaise where appropriate with employees on a continuous basis so that the existence and condition of asbestos in the working environment is known
- Provide adequate instruction and training for employees and supervision of health and safety measures
- Consult with employees, their representatives and organisations, and SafeWork NSW on the control of exposure to airborne asbestos
- Anticipate the need for the control of asbestos risks to be initiated in any particular case
- Provide appropriate protective clothing and equipment, hygiene procedures and personal decontamination facilities
- Prepare, complete, and submit documents for obtaining necessary approvals

Specific Christie Civil employee responsibilities include the following:

- Comply with instructions given for their own safety and health and that of others generally
- Comply with all work procedures and instructions related to asbestos
- Co-operate with supervisors and managers in their fulfilment of legislative obligations
- Take care of their safety and health and that of others, and abide by their duty of care provided for in legislation
- Report immediately to their supervisor any perceived safety or health risk
- Wear and maintain in good order all protective clothing and apparatus provided by the manager or supervisor for personal protection and maintain same in good order
- Ensure all equipment is in good working order

The Christie Civil Systems Manager also has a number of specific responsibilities, including:

- Consulting on health and safety matters generally and on measures that may need to be taken on asbestos in occupied areas, on machinery and equipment
- Keeping themselves informed of advice given by competent persons in relation to inspections and meeting health and safety commitments
- Advising members of their obligations and responsibilities under WHS legislation

8. Asbestos Management Plan and Register Review

Both this Asbestos Management Plan and the site Asbestos Register are to be reviewed at regular intervals by a competent person to ensure their ongoing relevance to the works being undertaken.

The Asbestos Register is to be reviewed a minimum of once per five years and if any of the following situations occur:

- The Asbestos Management Plan is reviewed
- Further asbestos or ACM is identified in the workplace
- Asbestos is removed from or disturbed, sealed or enclosed at the workplace

The Asbestos Management Plan must also be reviewed on a minimum basis of once per five years, or if any of the following situations occur:

- There is a review of the Asbestos Register or control measures
- Asbestos is removed from or disturbed, sealed or enclosed at the workplace
- The plan is no longer adequate for managing asbestos or ACM at the workplace
- A Health and Safety Representative requests a review if they reasonably believe that any of the matters listed in the above points affects or may affect the health and safety of a member of their work group and the Asbestos Management Plan was not adequately reviewed

Appendix A - Asbestos Register

SSPF15

Asbestos + ACM Register

09/08/21

Rev: B

PROJECT:

Asbestos Register

DATE IDENTIFIED	IDENTIFIED BY	LOCATION OF MATERIAL	TYPE & CONDITION OF MATERIAL	ACCESSIBLE AREA	RESULT OF ANALYSIS / HYGIENIST REPORT	ACTION TAKEN (NCR required for confirmed Asbestos)	TIPPING LOG REFERENCE	COMMENTS/PRESUMPTIONS

Appendix B – Safe Work Method Statement

SAFE WORK METHOD STATEMENT

Job/Task or Process:	Asbestos Removal		
Personnel Details		**Equipment Details**	
Occupations: **Trades/skills/work teams**	All	**Static Plant and Equipment:**	N/A
Qualifications: **Licences/Qualifications/Permits**	Permit to Excavate, Asbestos Removal Licence	**Mobile Plant and Equipment:**	Excavator, trucks
Training: **Completed and/or required**	WHS Industry Induction, SWMS Induction, Christie Civil Site-specific Inductions, Site Supervisor: Supervise asbestos removal.	**Mandatory Personal Protective Equipment:**	Hi-visibility Clothing, Hard Hats, Steel-capped Boots
Personal duties and responsibilities:	Foreman – Supervise Engineer – Ensure Quality, Safety and Environmental aspects maintained Labourer – Perform tasks	**Safety Emergency Equipment:**	First Aid Kit, Fire Extinguishers, Spill Kits
Key Project Personnel:	Project Manager – Site Engineer – Site Foreman –	**Maintenance Checks:**	Pre-start Checks on any machine prior to use each morning. Servicing as per Manufacturer requirements. Christie Civil Plant Onboarding Checklist review and approval

SWMS Review:	This SWMS is to be reviewed on a minimum basis of once per month, or whenever the work task changes, whichever is the sooner occurrence.
SWMS Induction:	This SWMS has been developed in consultation between the workers and management staff who will be participating in the nominated activities contained herein. All workers required to perform the tasks detailed within this SWMS must be inducted into the SWMS and have signed off to acknowledge that they understand the work method and safety controls, prior to commencing works.
Hazardous Substances:	This SWMS identifies the Hazardous substances required to perform this task. For further information on the Hazardous Substances see Site Management team for applicable Safety Data Sheets

Hazardous Substances:								
	Brand							
	Product							

Additional Personal Protective Equipment:						

Codes of Practice, Legislation:	• Work Health and Safety Act, 2011
	• Work Health and Safety Regulations, 2017
	• Following Codes of Practice:
	  ○ Hazardous manual tasks
	  ○ How to manage work health and safety risks
	  ○ Work health and safety consultation, coordination and cooperation
	  ○ Managing noise and preventing hearing loss at work
	  ○ Moving plant on construction sites
	  ○ Excavation work
	  ○ How to Safely Remove Asbestos
	  ○ How to manage and control asbestos in the workplace
	• Code of Practice for Plant and Equipment
	• Protection of the Environment Operations Act 1997
	• Environment Protection and Biodiversity Conservation Regulations 2000
	• Environment and Heritage Legislation Amendment Act (No. 1) 2006
	• Australian Standards (Environment) ISO 14001:2016
	• Australian Standards (OH&S) ISO 4801:2001
	• Australian Standards (Quality) ISO 9001:2016
	• Lendlease Global Minimum Requirements
	  ○ 4.10 Occupational Health Exposure
	  ○ 4.13 Degradation and pollution of the Environment
	• Safe Work Australia's Model Code of Practice: How to manage and control asbestos in the workplace
	• Lendlease unexpected finds procedure

RISK MATRIX

Probability			RISK				
Descriptive	**Qty/yr**	**Relational**					
Very High	>1-0.1	Happens to you often	5	10	15	20	25
High	0.1-0.01	Likely to occur in your lifetime	4	8	12	16	20
Medium	0.01-0.001	Likely to occur to someone you know	3	6	9	12	15
Low	0.001-0.0001	Does occur in industry	2	4	6	8	10
Very Low	< - 0.0001	Extremely unlikely world event	1	2	3	4	5
		Safety	**A.** First aid (minor)	**B.** First aid (Major)	**C.** Lost time injury	**D.** Disability, major health issue	**E.** Fatalities
		Environment	**F.** Negligible minor spills	**G.** Minor effects, neighbour/council	**H.** Significant release/damage	**I.** Major issues, potential for news coverage	**J.** Massive Damage, Press/TV coverage

Risk Reduction Methods

-Elimination
-Substitution
-Isolation
-Engineering
-Administration

RISK ACCEPTANCE

<5 - Acceptable
>5 - Avoid/mitigate
>10 - Mitigate/Unacceptable (address concerns)
>20 - Address concerns immediately

NB - All risks should be minimised as far as reasonably practicable

JOBS/TASKS/PROCESSES (Basic steps in logical sequence - what is to be done not how)	**HAZARDS** Unsafe conditions and Unsafe acts	**Original Risk**	**Resp.**	**CONTROLS** Safety Measures/Safe Work Practices/PPE	**Adjusted Risk**
Note that this SWMS is to be used in conjunction with the General Earthworks SWMS					
Excavate and load Asbestos Containing Material (ACM) into trucks and dispose off site	Exposure to asbestos, including contamination of clothing	12D	Foreman/ Asbestos Supervisor	• Pre-start prior to work commencing to ensure all are aware of contaminated area. • Contaminated area to be fenced off and signage installed to restrict access. • Approved, fit tested P2/P3 mask and Type 5/6 coveralls to be worn at all times while inside contaminated area. • Ensure a mist is sprayed over the asbestos material to reduce the likelihood of airborne contaminants. • Bonded asbestos only to be removed by Christie Civil. If friable asbestos is encountered, works shall cease and an appropriately licenced (Class A) contractor shall be engaged. • Trucks to be fitted with asbestos safe (waterproof) tarps and to transport ACM directly to a licenced disposal facility. • Asbestos protective equipment (coveralls, gloves, boot covers etc) must be disposed of in Asbestos bags and disposed of at a licensed asbestos facility.	4D
	Access work area without correct PPE prior to clearance issued	12D	Foreman/ Asbestos Supervisor	• Once all asbestos is removed, the hygienist will provide a clearance certificate for the work area. The Asbestos Supervisor will advise once this clearance has been issued and the fencing and signage can be removed.	4D
Removal of contaminated Clothing	Exposure to asbestos, including contamination of clothing	12D	Foreman/ Asbestos Supervisor	• Remove any visible residue from disposable protecti ve clothing with damp cloths (do not re-use or re-soak damp cloths). • Carefully remove disposable protective clothing and place into asbestos waste plastic bags whilst P2/P3 dust mask is still worn.	4D

				• Seal all asbestos waste plastic bags with duct tape and place into second plastic bag marked "Asbestos Waste" and seal. • Remove disposable P2/P3 dust mask and place in double bag, seal with duct tape and mark as "Asbestos Waste", or if wearing a reusable mask ensure mask is cleaned with a damp cloth/wipe which is disposed of as asbestos waste.	

Worker/s Involved in Development of this SWMS:		
Full Name:	Signed:	Date:
Full Name:	Signed:	Date:
Full Name:	Signed:	Date:
Full Name:	Signed:	Date:

This Safe Work Method Statement has been shown and explained to me.
I have reviewed these procedures - including any applicable Hazardous Substances - and am willing to implement the controls required to carry out the work safely.

Induction Presenter Initials	***Name***	***Signature***	***Date***

Induction Presenter Initials	***Name***	***Signature***	***Date***

Signed and approved by Project Manager **Project Manager:** _____

Reviewed by:
Client:_____

Date:____ ___ **Date:**_____ /_____/20___

SWMS REVIEW REGISTER

Review Date	Reviewed By	Acceptable		Comments
		Yes	No	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	
		☐	☐	

Appendix C – Site Plan

Site Address: Ivanhoe Estate, Epping & Lyonpark Roads, Macquarie Park

Appendix D – Incident Report Form

SSPF12
Incident Report
10/12/20
Rev: J

INCIDENT REPORT FORM

Project: | **Incident Number:**

Incident Type: **Safety:** ☐ **Environmental:** ☐ **Other:** ☐

NOTIFIABLE: *(circle as relevant)* **YES** **NO**

Notified by: **Date + Time Notified:**

Notification record to be attached to this Form

Outcome of Incident:

Safety:

☐ Fatality ☐ To Hospital ☐ To Doctor ☐ First Aid Treatment
☐ Near Miss ☐ Lost Time: …….days

Environmental: ☐ Minor ☐ Major ☐ Near Miss

Other: ☐ Property damage

(provide details)

Details of Person Involved: *(complete separate Form for each person)*

Surname | Given Names | Date of Birth (dd / mm / yy)

Residential Address | Contact Phone No.

Occupation | Duties at time of Incident

Employer

Experience Years Months

SSPF12
Incident Report
10/12/20
Rev: J

INCIDENT REPORT FORM

Date + Time of Incident:

Time		Day		Month		Year	
	am / pm						

Date + Time Reported:

Time	Day		Month		Year	

Incident Details: *(what was happening at the time, what equipment was being used? etc)*

Location of Incident:

Incident Witness/es:

Name: ***Contact Phone:***

Name: ***Contact Phone:***

What events contributed to the Incident occurring? *e.g.*

☐ Inadequate Supervision ☐ Inadequate Training ☐ Inadequate Procedure/s

☐ Weather Conditions ☐ Not following SWMS ☐ Equipment ☐ Plant ☐ Other

Provide full details:

INCIDENT REPORT FORM

Immediate Action Taken:

Investigation by: …… **Signature:**

Position: …… **Date: …. / …. / 20……**

Refer SSP9 - Work Related Incidents re qualifications for undertaking Incident Investigations

Corrective Action required:

Due Date: …. / …. / 20……

Identified by: …… **Signature:**

Position: …… **Date: …. / …. / 20……**

INCIDENT REPORT FORM

Verification
Corrective action has been completed.

Signature: …….. **Date: …. / …. / 20……**

Preventive action required: *e.g.*

☐ Training ☐ Systems change ☐ Other

Provide full details:

Identified by: …… **Signature:**

Position: …… **Date: …. / …. / 2……**

Reviewed by Project Manager – Signed off:		**Date:**	

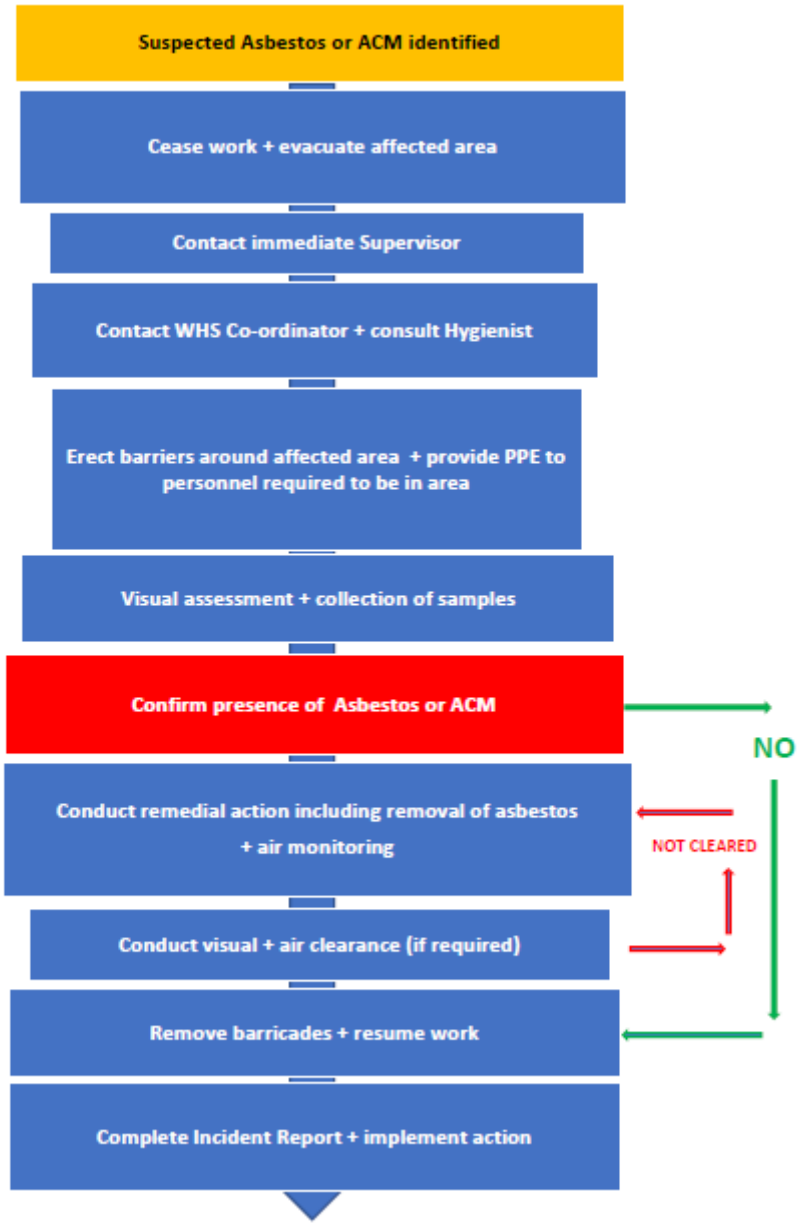
COMPLETE AN NCR *SOPF4.04.1 - NCR PAR*
FORWARD WITH THIS FORM TO SYSTEMS MANAGER
for completion of improvement and Management Review processes

Worker Rehabilitation required: **YES / NO**

IF *YES*, FORWARD COPY OF THIS FORM TO HEAD OFFICE

Appendix E – Emergency Response Plans

Emergency Procedure for Suspected Asbestos or ACM Finds



Emergency Procedure for High Air Monitoring Results