



# CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

SSD-7500 – Construction, fit-out and operation of a warehouse and distribution uses, with ancillary offices  
5 and 9 Culverston Road, Minto

14 MARCH 2022

# SSD-7500 – Construction, fit-out and operation of a warehouse and distribution uses, with ancillary offices, 5 and 9 Culverston Road, Minto

## Construction Environmental Management Plan

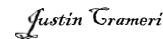
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## REVISIONS

| Revision | Date       | Description                     | Prepared by | Approved by |
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| A        | 30/01/2022 | Initial draft                   | PR          | JC          |
| B        | 31/01/2022 | Final draft                     | PR          | JC          |
| C        | 09/03/2022 | Final                           | PR          | JC          |
| D        | 11/03/2022 | Final with CTMP and SMP Updates | PR          | JC          |
| E        | 14/03/2022 | Updated with Rev B LMP          | PR          | JC          |



## KEY TERMS AND ACRONYMS

| Acronym/Term            | Meaning                                                                                                                                                                                                                                                                                                                         |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS                      | Australian Standard                                                                                                                                                                                                                                                                                                             |
| CEMP                    | Construction Environmental Management Plan                                                                                                                                                                                                                                                                                      |
| CFFMP                   | Construction Flora and Fauna Management Plan                                                                                                                                                                                                                                                                                    |
| CCCHMP                  | Community Consultation and Complaints Handling Procedure                                                                                                                                                                                                                                                                        |
| CNVMP                   | Construction Noise and Vibration Management Plan                                                                                                                                                                                                                                                                                |
| CoC                     | Conditions of Consent as detailed in the EP&A Act Development Consent SSD 7099                                                                                                                                                                                                                                                  |
| Contractor's SM         | Contractor's Site Manager                                                                                                                                                                                                                                                                                                       |
| Contractor's HSE        | Contractor's Health, Safety and Environment Coordinator                                                                                                                                                                                                                                                                         |
| Contractor's PM         | Contractor's Project Manager                                                                                                                                                                                                                                                                                                    |
| Council                 | Campbelltown City Council                                                                                                                                                                                                                                                                                                       |
| SMP                     | Stormwater Management Plan                                                                                                                                                                                                                                                                                                      |
| CTMP                    | Construction Traffic Management Plan                                                                                                                                                                                                                                                                                            |
| DIPNR                   | Department of Infrastructure Planning and Natural Resources                                                                                                                                                                                                                                                                     |
| DPIE                    | Department of Planning, Industry and Environment                                                                                                                                                                                                                                                                                |
| ECMs                    | Environmental Control Maps                                                                                                                                                                                                                                                                                                      |
| EIS                     | Environmental Impact Statement                                                                                                                                                                                                                                                                                                  |
| EMS                     | Environmental Management Systems                                                                                                                                                                                                                                                                                                |
| ENM                     | Excavated Natural Material (ENM) is naturally occurring rock and soil (including materials such as sandstone, shale, clay and soil) that has: a) Been excavated from the ground b) Contains at least 98 per cent (by weight) natural material c) Does not meet the definition of Virgin Excavated Natural Material (VENM).      |
| Environmental Emergency | Any event that causes or has the potential to cause material harm to the environment. An environmental emergency is a Class 3 incident.                                                                                                                                                                                         |
| Environmental Incident  | An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. Environmental incidents include pollution incidents and environmental emergencies. Environmental incidents may arise from natural (e.g. storm, wind or bushfire) or human factors. |
| EPA Act                 | <i>Environmental Planning and Assessment Act 1979</i>                                                                                                                                                                                                                                                                           |
| EPA                     | Environment Protection Authority                                                                                                                                                                                                                                                                                                |
| EPL                     | Environment Protection Licence                                                                                                                                                                                                                                                                                                  |
| ERP                     | Emergency Response Plan                                                                                                                                                                                                                                                                                                         |

## CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

| Acronym/Term                     | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GHG                              | Greenhouse gases                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ICAM                             | Incident Cause Analysis Method                                                                                                                                                                                                                                                                                                                                                                                                                |
| ISO                              | International Organisation for Standardisation                                                                                                                                                                                                                                                                                                                                                                                                |
| Material harm                    | Harm that involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment) |
| Minor amendment                  | Updates to the CEMP, CEMP sub-plans and monitoring programs that are of an administrative nature and are consistent with the terms of the consent and the CEMP, CEMP sub-plans and monitoring programs, do not materially alter the outcomes of the Project, such that planning modification would be required by DPIE and are not considered to carry an environmental risk greater than that considered in the approved Project EIS         |
| Non-compliance                   | An occurrence, set of circumstances, or development that results in a non-compliance or is non-compliant with Development                                                                                                                                                                                                                                                                                                                     |
| Non-conformance                  | Observations or actions that are not in strict accordance with the CEMP and the aspect specific sub-plan.                                                                                                                                                                                                                                                                                                                                     |
| Principal's Representative       | The Project Management Team and Environmental Specialists                                                                                                                                                                                                                                                                                                                                                                                     |
| Project ('the')                  | The SSD-7500 for warehouse and distribution uses at 5 and 9 Culverston Road, Minto                                                                                                                                                                                                                                                                                                                                                            |
| Project personnel                | All persons listed in Section 2.4 including sub-contractors working on the Project site.                                                                                                                                                                                                                                                                                                                                                      |
| Project site / Project footprint | The subject of the SSD-7500 for warehouse and distribution uses at 5 and 9 Culverston Road, Minto                                                                                                                                                                                                                                                                                                                                             |
| RtS                              | Response to Submissions                                                                                                                                                                                                                                                                                                                                                                                                                       |
| SSD                              | State significant development                                                                                                                                                                                                                                                                                                                                                                                                                 |
| VENM                             | Virgin Excavated Natural Material (VENM) has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities                                                                                                                                                                                                        |
| WMS                              | Work Method Statement                                                                                                                                                                                                                                                                                                                                                                                                                         |

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## 1 INTRODUCTION

On 23 June 2017, a State Significant Development ('SSD') Application was approved by the Minister for Planning under delegation for construction, fit-out and operation of a warehouse and logistics hub including four warehouse buildings for warehousing and distribution uses, with ancillary offices. This approval was subsequently modified on 16 December 2021 to change the layout staging and the warehouse size for three of the four warehouses. The modification was sought in response to market research and discussions with prospective tenants.

The construction of the warehouses will be delivered in stages, with ancillary car parking to be delivered with each stage.

This Construction Environmental Management Plan is specifically developed for the construction of Stages 1 and 2 of the approved development, including associated warehousing, office space, external storage and carparking. This CEMP and relevant sub-plans will be reviewed and updated prior to future construction stages of the Development. This CEMP will also be updated after any modification obtained against the Development Consent or following an incident requiring reporting under CoC C10 of this Development Consent.

### 1.1 Purpose and Context

This CEMP is the overarching plan for construction environmental management of the Project.

This CEMP has been developed in accordance with Guidelines for the Preparation of Environmental Management Plans (Dept. of Infrastructure of Planning and Natural Resources (DIPNR), 2004) and has been structured to meet the requirements of Development Consent SSD 7500.

The objectives of this CEMP are to:

- Identify and implement relevant environmental legal and other regulatory requirements applicable to the construction works
- Identify the project environmental management measures which will enable the Project to minimise and manage impacts on the environment and community
- Assign roles and responsibilities for the implementation, management and review process
- Provide a consistent and uniform approach to environmental management
- Provide all personnel working on the Project with sufficient information to undertake their works in accordance with the development consent conditions, contractual, legal and other relevant environmental requirements
- Provide a framework for training, development and support (systems, procedures and documentation) necessary to undertake the works
- Enable the commitments within the EIS process to be captured and implemented on-site

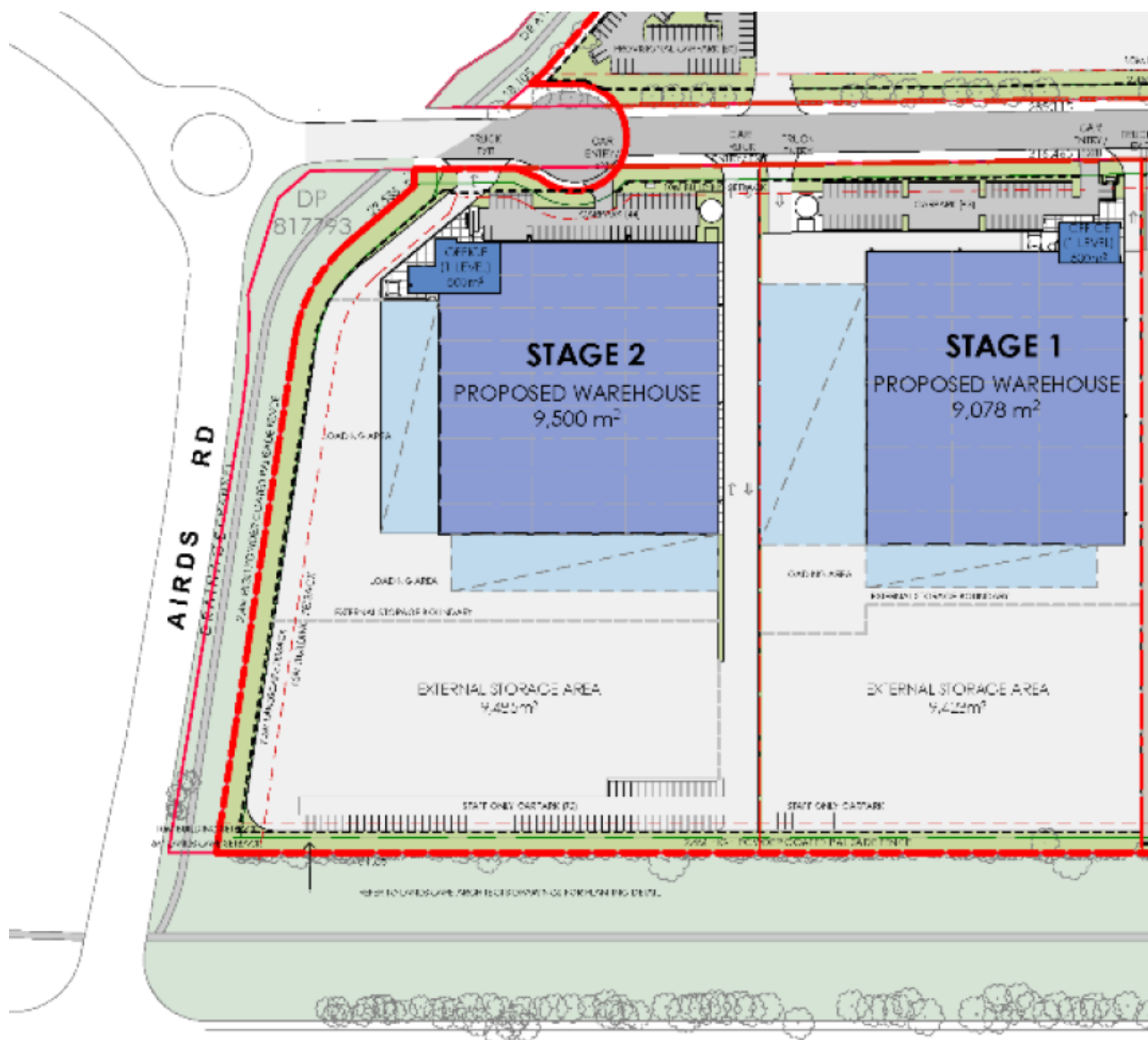


Figure 1-1 Site Location

### 1.1.1 CEMP and Sub-Plans

A summary of the construction environmental documentation, including the CEMP and Sub-plans, are provided below:

- Construction Environmental Management Plan (CoC C1)
- Construction Traffic Management Plan (CoC B11)
- Stormwater Management Plan (CoC B11)
- Flood Response and Evacuation Plan (B13)
- Waste Management Plan (CoC B30)
- Unexpected Contamination Finds Protocol (CoC B38)
- Landscape Management Plan (CoC B44)
- Community Consultation and Complaints Handling (CoC C2(g))

Construction will not commence until the CEMP and sub-plans are approved by the Planning Secretary in accordance with CoC C1.

Construction will be undertaken in accordance with the most recent, approved version of this CEMP and sub-plans.

### 1.1.2 Distribution and Availability

The most recent approved version of this CEMP and other nominated documents and records will be made publicly available at the site entrance a minimum of 48 hours prior to the commencement of construction in accordance with CoC.

### 1.1.3 Revision

In accordance with CoC C8, the CEMP will be revised within 3 months of a modification to the terms of this consent or the submission of an incident report under CoC C10.

The CEMP and sub-plans are to be prepared to the satisfaction of the Secretary. All plans will be submitted to the Department of Planning, Industry and Environment prior to the commencement of construction for review and approval.

## 1.2 Project Description

The site is approximately 29.36ha comprising regular allotments of land bound on four sides by Rose Payten Drive (South), Airds Road (West and North) and the Main Southern Railway (East). The site is also partially divided into Eastern and Western sections with a road running South from Airds Road through its centre, Culverston Road.

The proposal consists of two industrial facilities of varying sizes along the Western side with the Eastern side being proposed as external storage. The site layout addresses the necessity for a visually appealing streetscape, building form and orientation whilst also allowing for rational access and operational functionality for the intended users. This creates a compatible proposal that responds to the existing industrial context and supports a positive interaction with the streetscape. The promotion of safety and a high level of functionality and amenity are also key considerations in the proposal.

Within the site, building layouts address the main street frontages including Rose Payten Drive, Airds Road, and Culverston Road and conceal loading areas within the site where possible. As an additional measure, landscape buffers have also been introduced to improve visual amenity.

The proposal will retain the use of the site for employment-generating purposes by facilitating the operation of the site for the storage and distribution of freight. Accordingly, the proposal will create employment opportunities and service businesses that operate on a local and national scale.

### 1.2.1 Construction Activities

Construction of the Project is anticipated to be approximately 10 months. Construction works have been divided into delivery phases, specifically:

- Site Preparation
- Demolition and Bulk Earthworks
- Warehouse, External Storage and Carparking Construction

#### 1.2.1.1 Site Preparation

A summary of the Site Preparation activities includes, but are not limited to:

- Site surveying including, but not limited to, the installation of survey equipment such as survey controls, repeater stations, environmental monitoring equipment and construction monitoring equipment
- Property acquisition adjustments including installation of property fencing, and relocation and adjustments of utilities to property including water supply and electricity
- Relocation and connection of utilities



## CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

- Establishment of site buildings and structures including erosion and sediment controls
- Establishment of exclusion zones
- Installation of temporary construction compounds, including amenities and office for bulk earthworks.

### 1.2.1.2 Demolition and Bulk Earthworks

Demolition, bulk earthworks, drainage and utility activities include, but not limited to:

- Demolition of existing buildings and structures, including offsite disposal of demolition waste
- Establishment of temporary stockpiling pads and associated temporary access roads
- Establishment of temporary batch plant sites and installation of batch plant if required
- Importation, stockpiling and placement of clean fill (bulk earthworks) and raising of the Project site to final level
- Importation, placement and compaction of engineered fill, which is comprised of virgin excavated natural material (VENM), excavated natural material (ENM) or other material approved in writing by the NSW Environment Protection Authority (EPA)
- Importation of construction materials
- Installation of erosion and sediment controls
- Installation of on-site detention basins
- Drainage and utilities installation.

### 1.2.1.3 Warehousing, External Storage and Carparking Construction

Warehousing activities include, but not limited to:

#### **Construction and fit-out of warehousing**

- Establishment of construction compound, temporary fencing/ hoardings and temporary sediment and erosion control
- Installation of temporary site offices and amenities
- Excavation, foundation and floor slab installation
- Erection of framework and structural walls, including use of cranes
- Installation of roof, including use of cranes
- Internal fit out
- Landscaping
- Preparation of warehouse access road subgrade
- Forming of new kerbs, gutters, medians and other structures
- Placement of asphalt and concrete pavement
- New line marking, lighting and sign posting
- Removal of construction traffic management and opening of the internal road and warehouse access roads to traffic.

#### **Miscellaneous structural construction and finishing works**

- Decommissioning/demobilisation of the construction area
- Commissioning of operational facilities

## CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

- Landscaping
- Rehabilitation of affected areas
- Post-construction condition surveys
- Post-construction site survey
- Removal of construction environmental controls
- Removal of construction ancillary facility related traffic signage
- Removal of construction traffic management and opening of new works to traffic.

### 1.2.2 Construction Hours

In accordance with CoC B18, construction works will generally be undertaken during standard daytime construction working hours, being:

- 7:00 am to 6:00 pm Monday to Friday
- 8:00 am to 1:00 pm Saturday
- No works on Sunday or public holidays.

Construction outside of the hours nominated above may be undertaken in the following circumstances (CoC):

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

## 1.3 Environmental Policy

Texco's Safety, Health and Environmental Policy (Figure 1-2) describes the Project's commitments to continual improvement in environmental performance and compliance obligations. The Project and its nominated contractors will operate in accordance with this policy which will be:

- Displayed at prominent locations on the Project site
- Communicated to site personnel during induction and training
- Made publicly available and accessible to clients and concerned / interested members of the public.

All personnel associated with the Project, including sub-contractors, must comply with the spirit and intent of these policies.

## WORKPLACE HEALTH AND SAFETY

Texco Construction is a business that provides services in the building construction industry and is committed to conducting business in a manner that protects the health and safety of all employees.

Management is committed to continual improvement aimed at eliminating work related illness and injury. This policy is fully supported by senior management and employees.

Texco is committed to managing our projects in a manner that as far as practicable, complies with the highest standards of health and safety prescribed by legislation, associated regulations, codes of practice, Australian standards and other requirements.

Texco will ensure, as far as is practicable, that it will:

- ✗ Communicate this Policy to all employees and other interested parties, as appropriate, to ensure they are aware of and agree to comply with their obligations with respect to company operations
- ✗ Undertake regular consultation with all employees and subcontractors to ensure that the policy operates effectively;
- ✗ Seek personal commitment from all employees, contractors, subcontractors and consultants to healthy and safe workplace practices
- ✗ Provide health and safety risk management systems and procedures that are relevant to the nature and scale of work undertaken
- ✗ Provide adequate resources to ensure that a safe working environment is provided to all employees, contractors and subcontractors
- ✗ Ensure safe design is considered by our consultants and incorporated in both the planning and construction phases
- ✗ Provide and maintain safe plant, equipment and systems or work, including safe storage and handling of hazardous substances
- ✗ Educate and train all employees to ensure that they are competent to undertake their role in a safe manner
- ✗ Investigate incidents, accidents and near misses with a view of eliminating recurrences
- ✗ Work with our partners, contractors and subcontractors to ensure that appropriate health and safety standards are implemented across projects
- ✗ Set measurable objectives and targets in order to continually improve our health and safety performance and monitor, measure, analyse and report health and safety performance
- ✗ Provide facilities for first aid treatment and the monitoring of the health and welfare of employees
- ✗ Stay informed of safety related trends and initiatives and conduct an annual management review process to ensure this policy's relevance and ongoing improvement
- ✗ Conduct reviews to ensure systems remain appropriate to the business
- ✗ Ensuring effective injury management and rehabilitation is provided to all workers



Matthew Barker

Director  
Date: 13 November 2019



Tom Bull

Director  
Date: 13 November 2019

Figure 1-2 Texco Environmental Policy

## 1.4 Project Objectives and Targets

Project objectives and targets have been developed incorporating the governance, social and environmental aspects of sustainable development. Corresponding reporting and monitoring requirements are detailed in Table 1-1.

Table 1-1 Project's Objectives and Targets

| Objective                                                        | Indicator                                                                                                           | Target                                                                                                                                                     | Reporting / Monitoring                                                                                                         | Responsibility          | Timing for Compliance | CEMP Reference |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------|----------------|
| <b>Governance and Management</b>                                 |                                                                                                                     |                                                                                                                                                            |                                                                                                                                |                         |                       |                |
| Construct the Project in accordance with environmental approvals | <ul style="list-style-type: none"> <li># non-compliances</li> </ul>                                                 | <ul style="list-style-type: none"> <li>Zero non-compliances at each quarterly construction compliance reporting stage</li> </ul>                           | <ul style="list-style-type: none"> <li>Audits</li> <li>Construction compliance reporting</li> <li>Management review</li> </ul> | Construction Contractor | Quarterly             | Section 4.4    |
| Compliance with all relevant legislative requirements            | <ul style="list-style-type: none"> <li># of infringements</li> <li># of formal regulatory warnings</li> </ul>       | <ul style="list-style-type: none"> <li>Zero regulatory infringements (penalty notices or prosecutions)</li> <li>Zero formal regulatory warnings</li> </ul> | <ul style="list-style-type: none"> <li>Audits</li> <li>Construction compliance reporting</li> <li>Management review</li> </ul> | Construction Contractor | End of Project        | Section 2.4    |
| Minimise the potential for environmental incidents               | <ul style="list-style-type: none"> <li>Environmental Incident Frequency Rate (EIFR)</li> </ul>                      | <ul style="list-style-type: none"> <li>Class 2 or Class 3 EIFR of &lt;1</li> </ul>                                                                         | <ul style="list-style-type: none"> <li>Monthly reports</li> </ul>                                                              | Construction Contractor | Monthly               | Section 2.8    |
| <b>Minimising Social Impacts</b>                                 |                                                                                                                     |                                                                                                                                                            |                                                                                                                                |                         |                       |                |
| Proactively engage with the Project team                         | <ul style="list-style-type: none"> <li># inspections accompanied by supervisory or engineering personnel</li> </ul> | <ul style="list-style-type: none"> <li>50% of project environmental inspections accompanied by Contractor's Site Manager (SM)</li> </ul>                   | <ul style="list-style-type: none"> <li>Monthly reports</li> <li>Weekly environmental inspections</li> </ul>                    | Contractor's CM         | Weekly                | Section 4.2    |

## CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

| Objective                               | Indicator                                                                                                                                                                                                    | Target                                                                                                                                                                                                                                                                                                                                                      | Reporting / Monitoring                                                                                      | Responsibility                                     | Timing for Compliance | CEMP Reference                                   |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------|--------------------------------------------------|
|                                         | <ul style="list-style-type: none"> <li># of inspections signed off</li> </ul>                                                                                                                                | <ul style="list-style-type: none"> <li>100% of weekly environmental inspections signed off</li> </ul>                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Monthly reports</li> <li>Weekly environmental inspections</li> </ul> | Contractor's Project Manager (PM)                  | Weekly                | Section 4.2                                      |
|                                         | <ul style="list-style-type: none"> <li># of environmental toolbox talks per month</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>Minimum one environmental tool box per month</li> </ul>                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>Training records</li> </ul>                                          | Construction Contractor                            | Monthly               | Section 2.7                                      |
| Support local health and amenity        | <ul style="list-style-type: none"> <li># of environmental complaints per month</li> <li>Actual response time for each complaint</li> <li># of complaints resolved as a % of # complaints received</li> </ul> | <ul style="list-style-type: none"> <li>Receive less than three substantiated environmental complaints per month</li> <li>Complainant contacted within four hours of receiving complaint</li> <li>Complainant concerns adequately resolved such that prevention of perceived or potential human health and/or environmental impacts are achieved.</li> </ul> | <ul style="list-style-type: none"> <li>Complaints form</li> <li>Incident register</li> </ul>                | Construction Contractor<br>Construction Contractor | Monthly               | CCCHP                                            |
| <b>Minimising Environmental Impacts</b> |                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                             |                                                                                                             |                                                    |                       |                                                  |
| Minimise waste production               | <ul style="list-style-type: none"> <li>% of total construction and demolition waste recycled</li> </ul>                                                                                                      | <ul style="list-style-type: none"> <li>90% of construction and demolition waste to be recycled</li> </ul>                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Waste tracking spreadsheet</li> </ul>                                | Construction Contractor                            | Monthly               | <b>Error! Reference source not found.F- WMP</b>  |
|                                         | <ul style="list-style-type: none"> <li>% of spoil beneficially re-used on site</li> <li>% of spoil beneficially reused locally</li> </ul>                                                                    | <ul style="list-style-type: none"> <li>100% of spoil beneficially reused on-site or locally (not including contaminated material)</li> </ul>                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>Waste tracking spreadsheet</li> </ul>                                | Construction Contractor                            | Monthly               | <b>Error! Reference source not found.F - WMP</b> |



## CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN

| Objective | Indicator                                                                             | Target                                                                             | Reporting / Monitoring                                                       | Responsibility          | Timing for Compliance | CEMP Reference                                    |
|-----------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------|-----------------------|---------------------------------------------------|
|           | <ul style="list-style-type: none"> <li>% of office waste recycled</li> </ul>          | <ul style="list-style-type: none"> <li>&gt;60% of office waste recycled</li> </ul> | <ul style="list-style-type: none"> <li>Waste tracking spreadsheet</li> </ul> | Construction Contractor | Monthly               | Appendix F - WMP                                  |
|           | <ul style="list-style-type: none"> <li>% of topsoil retained as productive</li> </ul> | <ul style="list-style-type: none"> <li>95% Topsoil to remain productive</li> </ul> | <ul style="list-style-type: none"> <li>Waste tracking spreadsheet</li> </ul> | Construction Contractor | Monthly               | <b>Error! Reference source not found.</b> F - WMP |

## 2 ENVIRONMENTAL FRAMEWORK

### 2.1 Environmental Management Systems

Texcos EMS is part of an overarching management system which is known as SHEMS (Safety Health and Environmental Management System). The SHEMS provides the process and policy that govern all on-site and offsite activities. The SHEMS assists in the management of all construction activities from a safety, health and environmental management perspective. It is within this framework that the EMS exists. The EMS is built on ISO 14001:2015 and has third party accreditation. Texcos EMS provides the framework for reporting and documentation of environmental activities and this plan references relevant parts of Texcos EMS.

### 2.2 Environmental Management Documentation

This CEMP is the overarching management plan for a suite of environmental management documents for the Project. It provides a structure and systematic approach to environmental management and aligns to the EMS.

### 2.3 Document Control and Records

All Project documentation, including environmental records, will be controlled in accordance with the SHEMS document control system and the Project contractual requirements. Aconex will be used to store records, documents and plans.

Environmental records will be kept as objective evidence of compliance and conformance with environmental requirements, filed in Aconex and made available to relevant Project personnel. The controlled records and documentation retained on Aconex are the versions to be relied upon in determining compliance and performance.

Relevant sub-plans and WMS will be made available to those personnel who are responsible for their implementation. The Contractor's EM will enable their current issued documentation to be produced or made available.

Documentation will be maintained in a legible manner, dated (with dates of revision) and readily identifiable. Relevant documentation will be uploaded to the Project website.

### 2.4 Legislative Requirements

The regulatory framework for the Project is outlined within the Compliance and Obligations Register, kept by the Construction Contractor. This register identifies relevant legislative instruments, their key objectives and relevance to the Project, including legislative and voluntary obligations, permits and licences, standards and guidelines, and relevant CoC and management measures.

Where updated or revised versions of guidelines, protocols, standards or policies, or a replacement of them are available, the most recent versions should be applicable to this Plan.

#### 2.4.1 Development Approval

The Project has been approved under the EPA Act. This approval has environmental conditions relevant to the construction works for the Project, which are discussed below. In the compliance tables, Primary Conditions are specific to the development of the management plan, while Secondary Conditions are conditions which are related to the environmental aspects associated with the plan.

## CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

### 2.4.1.1 EPA Act Approval

The Project is being delivered under Part 4, Division 4.7 of the EPA Act. The SSD 7500 conditions of consent include requirements to be addressed in this CEMP and delivered during the Project. These requirements, where and how they are addressed, is provided within Table 2-1.

Table 2-1 Conditions of Consent (CoC)

| CoC                       | Requirement                                                                                                                                                                    | CEMP Section      | How Addressed                                                                                                                                                                                                                                                                                     |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Conditions</b> |                                                                                                                                                                                |                   |                                                                                                                                                                                                                                                                                                   |
| C1                        | Prior to the commencement of construction, the Applicant must prepare a Construction Environmental Management Plan (CEMP) to the satisfaction of the Secretary. The CEMP must: | This CEMP         | This CEMP has been prepared to meet the Project's regulatory and policy requirements in a systematic manner and to continually improve the Project's environmental performance.                                                                                                                   |
|                           | (a) Submitted to the satisfaction of the Secretary;                                                                                                                            | N / A             | This plan will be submitted to the Planning Secretary for approval prior to construction.                                                                                                                                                                                                         |
|                           | (b) identify all statutory approvals that apply to the Development;                                                                                                            | Section 2.4       | Legislation applicable to the Project have been identified within this CEMP.                                                                                                                                                                                                                      |
|                           | (c) outline all environmental management practices and procedures to be followed during construction works associated with the Development;                                    | Section 3         | Environmental management measures relevant to this CEMP are detailed within the Implementation section.                                                                                                                                                                                           |
|                           |                                                                                                                                                                                | Sub-plans         | Specific environmental management measures are detailed in the relevant sub-plans.                                                                                                                                                                                                                |
|                           | (d) describe all activities to be undertaken on the site during construction of the Development, including a clear indication of construction stages;                          | Section 1         | This CEMP and sub-plans are relevant to Stages 1 and 2 of the development. Specific construction activities are provided in Section 1.                                                                                                                                                            |
|                           | (e) detail how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts;  | Section 1.4       | Environmental objectives and targets have been established for this project. These will be monitored as part of routine inspections and internal auditing. Any non-conformance will be resolved in accordance with this CEMP. This process also applies to the performance against the sub-plans. |
|                           |                                                                                                                                                                                | Section 4         |                                                                                                                                                                                                                                                                                                   |
|                           |                                                                                                                                                                                | Sub-plans         |                                                                                                                                                                                                                                                                                                   |
|                           | (f) description of the roles and responsibilities for all relevant employees involved in construction works associated with the Development; and                               | Section 2.5       | Relevant project roles and their responsibilities are provided.                                                                                                                                                                                                                                   |
|                           | (g) include all sub-management plans required under Condition C2 of this consent.                                                                                              | Appendices B to I | Sub-plans are provided as appendices to this CEMP.                                                                                                                                                                                                                                                |
| C2                        | As part of the CEMP required under Condition C1 of this consent, the Applicant must append the following sub-management plans:                                                 | Appendix B        | N/A                                                                                                                                                                                                                                                                                               |



# CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

| CoC | Requirement                                                                                                                                                                                                                                             | CEMP Section           | How Addressed                                                                                                                                                |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | (a) Construction Traffic Management Plan (see Condition B1);                                                                                                                                                                                            | Appendix C             | N/A                                                                                                                                                          |
|     | (b) Stormwater Management Plan (see Condition B11);                                                                                                                                                                                                     | Appendix D             | N/A                                                                                                                                                          |
|     | (c) Flood Response and Evacuation Plan (see Condition B13);                                                                                                                                                                                             | Appendix E             | N/A                                                                                                                                                          |
|     | (d) Waste Management Plan (see Condition B30);                                                                                                                                                                                                          | Appendix F             | N/A                                                                                                                                                          |
|     | (e) Unexpected Contamination Finds Protocol (see Condition B38);                                                                                                                                                                                        | Appendix G             | N/A                                                                                                                                                          |
|     | (f) Landscape Management Plan (see Condition B44); and                                                                                                                                                                                                  | Appendix H             | N/A                                                                                                                                                          |
|     | (g) community consultation and complaints handling.                                                                                                                                                                                                     | Appendix I             | N/A                                                                                                                                                          |
| C3  | The approved CEMP (as revised and approved by the Secretary from time to time) must be implemented by the Applicant for the duration of the construction works.                                                                                         | Section 1              | This CEMP and sub-plans will be implemented for the duration of Stages 1 and 2.                                                                              |
| C7  | The Applicant must ensure that the environmental management plans and sub-management plans required under conditions C1, C2 and C4 of this consent are prepared by a suitably qualified person or persons in accordance with best practice and include: | N/A                    | This CEMP and relevant sub-plans have been prepared by suitably qualified environmental professionals, experienced in construction environmental management. |
|     | (a) detailed baseline data;                                                                                                                                                                                                                             | Sub-plans              | Baseline data for specific impacts is provided in the relevant sub-plans                                                                                     |
|     | (b) a description of:                                                                                                                                                                                                                                   | N/A                    | N/A                                                                                                                                                          |
|     | (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);                                                                                                                                                 | Section 2.4            | The relevant legislation that applies to this Development is the EPA Act. No licences or permits are required.                                               |
|     | (ii) any relevant limits or performance measures/criteria; and                                                                                                                                                                                          | Section 1.4            | Project-specific objectives and targets have been established for this Development.                                                                          |
|     | (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the Development or any management measures;                                                                         | Section 1.4            | Specific indicators have been provided for this Development.                                                                                                 |
|     | (c) a description of the management measures that would be implemented to comply with the relevant statutory requirements, limits or performance measures/criteria;                                                                                     | Section 3<br>Sub-plans | Management measures have been included in this CEMP and relevant sub-plans.                                                                                  |
|     | (d) a program to monitor and report on the:                                                                                                                                                                                                             | N/A                    | N/A                                                                                                                                                          |

# CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

| CoC | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CEMP Section              | How Addressed                                                                                                                                                                                                                                                                                                  |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | (i) impacts and environmental performance of the Development; and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Section 4.6               | Internal reporting has been established for this project.                                                                                                                                                                                                                                                      |
|     | (ii) effectiveness of any management measures (see (c) above);                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Section 4.5               | Management review will ensure that environmental management measures are effective.                                                                                                                                                                                                                            |
|     | (e) a contingency plan to manage any unpredicted impacts and their consequences;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Section 2.8               | Unexpected environmental impacts will be handled through the emergency preparedness and response process.                                                                                                                                                                                                      |
|     | (f) a program to investigate and implement ways to improve the environmental performance of the Development over time;                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Section 4                 | A continuous improvement process has been established to improve environmental performance.                                                                                                                                                                                                                    |
|     | (g) a protocol for managing and reporting any:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | N/A                       | N/A                                                                                                                                                                                                                                                                                                            |
|     | (i) incidents;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Section 2.8               | Incident response measures have been established for this project.                                                                                                                                                                                                                                             |
|     | (ii) complaints;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Section 2.6<br>Appendix I | A complaints handling process has been established which is outlined specifically in the CCCHP.                                                                                                                                                                                                                |
|     | (iii) non-compliances with statutory requirements; and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Section 4.4               | Non-compliances with statutory requirements will be responded to and reported to DPIE                                                                                                                                                                                                                          |
|     | (iv) exceedances of the impact assessment criteria and/or performance criteria; and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Section 4<br>Sub-plans    | Non-conformance with impact assessment criteria will be responded to as part of continuous improvement.                                                                                                                                                                                                        |
|     | (h) a protocol for periodic review of the plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Section 1                 | This CEMP and sub-plans will be reviewed and updated prior to future construction stages.                                                                                                                                                                                                                      |
| C8  | <p>Within three months of:</p> <p>(a) the determination of a modification application to modify the terms of this consent; or</p> <p>(b) the submission of an incident report under Condition C10,</p> <p>the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Secretary.</p> <p><i>Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the Development.</i></p> | Section 1                 | <p>This CEMP and sub-plans will be reviewed and updated prior to future construction stages.</p> <p>This CEMP and sub-plans will be reviewed and updated within 3 months of obtaining a modification to the approval and following an incident that is to be reported against CoC C10 of this Development.</p> |
| C9  | The Applicant must notify the Secretary and any other relevant agencies of any incident or potential incident with actual or potential significant off-site impacts on                                                                                                                                                                                                                                                                                                                                                                                                                  | Section 2.8               | Any incident triggered by this CoC will be reported to the Secretary,                                                                                                                                                                                                                                          |

## CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

| CoC                         | Requirement                                                                                                                                                                                                                                                               | CEMP Section         | How Addressed                                                                                                                                                                        |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | people or the biophysical environment associated with the Development immediately after the Applicant becomes aware of the incident.                                                                                                                                      |                      | including relevant controls and improvement measures.                                                                                                                                |
| C10                         | Within seven days of the date of this incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident and any such further reports which may be requested by the Secretary.                                           | Section 2.8          | Incidents will be reported to the Secretary and any other relevant agency.                                                                                                           |
| <b>Secondary Conditions</b> |                                                                                                                                                                                                                                                                           |                      |                                                                                                                                                                                      |
| A15                         | The Applicant must ensure that all demolition associated with the Development is carried out in accordance with Australian Standard AS 2601:2001: The Demolition of Structures, or its latest version and the requirements of the Work Health and Safety Regulation 2011. | Section 3.2          | All demolition works will be carried out in accordance with AS2601-2001. A specific WMS will be developed for demolition activities.                                                 |
| B17                         | The Applicant must:                                                                                                                                                                                                                                                       | N/A                  | N/A                                                                                                                                                                                  |
|                             | (a) ensure that only VENM, or ENM, or other material approved in writing by the EPA is used as fill on the site;                                                                                                                                                          | Section 3.2          | Records of all VENM, ENM and other material approved for use by the EPA will be kept on the project site and made available to DPIE on request.                                      |
|                             | (b) keep accurate records of the volume and type of fill to be used; and                                                                                                                                                                                                  |                      |                                                                                                                                                                                      |
|                             | (c) make these records available to the Department upon request.                                                                                                                                                                                                          |                      |                                                                                                                                                                                      |
| B23                         | If Aboriginal objects are uncovered during earthworks, excavation or disturbance, work in the immediate area must stop and the Regional Operations Group of the OEH, Council and the Registered Aboriginal Parties are to be consulted.                                   | Section 3.2<br>CCCHP | In the event Aboriginal artefacts are uncovered during construction, OEH, Campbelltown City Council and Tharawal ALC will be contacted                                               |
| B24                         | The applicant must:                                                                                                                                                                                                                                                       | N/A                  | N/A                                                                                                                                                                                  |
|                             | (b) minimise any visible off-site air pollution that occurs as a result of construction and operation the Development.                                                                                                                                                    | Section 3.2          | Measures will be implemented to minimise dust generation during construction, including limiting disturbance works, and suppression with water.                                      |
| B25                         | During demolition and construction, the Applicant must ensure that:                                                                                                                                                                                                       | Section 3.2          | A specific WMS will be developed for demolition works. This will include measures to reduce air quality impacts, including ensuring that trucks leaving the site have loads covered. |
|                             | (a) exposed surfaces and stockpiles are suppressed by regular watering;                                                                                                                                                                                                   |                      |                                                                                                                                                                                      |
|                             | (b) all trucks entering or leaving the site with loads have their loads covered; and                                                                                                                                                                                      |                      |                                                                                                                                                                                      |
|                             | (c) land stabilisation works are carried out progressively on-site to minimise exposed surfaces                                                                                                                                                                           |                      |                                                                                                                                                                                      |

## CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

| CoC | Requirement                                                                                                                                                                                                                                                                  | CEMP Section | How Addressed                                                                                                                                                                |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B27 | Dangerous Goods, as defined by the Australian Dangerous Goods Code, must be stored and handled strictly in accordance with all relevant Australian Standards.                                                                                                                | Section 3.2  | All dangerous goods will be handled according to the relevant Australian Standards. A specific WMS will be developed for each class of dangerous goods used for the project. |
| B28 | The Applicant must store all chemicals, fuels and oils used on-site in appropriately bunded areas in accordance with the requirements of all relevant Australian Standards, and the EPA's Storing and Handling of Liquids: Environmental Protection – Participants Handbook. | Section 3.2  | Chemicals, fuels and oils will be stored in appropriately bunded areas which comply with the relevant Australian Standards and EPA guidance.                                 |

### 2.4.2 Permits and Licences

There are no permits or licences required for the construction of this development. In the event that trade waste requires discharge to sewer, Sydney Water will be contacted to make arrangements for a trade waste licence.

### 2.4.3 Other Requirements

This CEMP has been prepared in accordance with the Guidelines for the Preparation of Environmental Management Plans (DIPNR 2004) as demonstrated in Table 2-2.

Table 2-2 Guidelines for the Preparation of Environmental Management Plans Requirements

| EMP Guideline Section    |                                                       | CEMP Section           |
|--------------------------|-------------------------------------------------------|------------------------|
|                          | Introduction                                          |                        |
|                          | Location                                              | Section 1.1            |
|                          | Construction activities                               | Section 1.2            |
|                          | Timing and schedule                                   |                        |
|                          |                                                       |                        |
| Background               | Project description                                   | Section 1.2            |
|                          | EMP context                                           | Section 1.1            |
|                          | EMP objectives                                        | Section 1.4            |
|                          | Environmental policy                                  | Section 1.3            |
| Environmental Management | Environmental management structure and responsibility | Section 2.5            |
|                          | Approval and licencing requirements                   | Section 2.4            |
|                          | Reporting                                             | Section 4.6            |
|                          | Environmental training                                | Section 2.7            |
|                          | Emergency contacts and responses                      | Section 2.8            |
| Implementation           | Risk assessment                                       | Section 3.1 Appendix B |

| EMP Guideline Section |                                                  | CEMP Section                                                                                                                                                                                                                             |
|-----------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | Environmental management activities and controls | Aspect specific CEMP sub-plans                                                                                                                                                                                                           |
|                       | Environmental control plans or maps              | Section 3.2                                                                                                                                                                                                                              |
|                       | Environmental schedules                          | Environmental schedules (e.g. site inspection checklists, waste register, imported spoil tracking register) will be retained on the Project's document management system and/or included in aspect specific sub-plans where appropriate. |
| Monitor and review    | Environmental monitoring                         | Section 4.1<br>Aspect specific CEMP sub-plans                                                                                                                                                                                            |
|                       | Environmental auditing                           | Section 4.3                                                                                                                                                                                                                              |
|                       | Corrective actions                               | Section 4.4                                                                                                                                                                                                                              |
|                       | EMP review                                       | Section 4.5                                                                                                                                                                                                                              |

## 2.5 Roles and Environmental Responsibilities

### 2.5.1 CEMP Management Hierarchy

All Project personnel are responsible for the implementation of this CEMP and have the responsibility to stop works if there is potential for a safety or environmental incident to occur.

The interaction between the key organisations involved in environmental management is displayed in Figure 2-1.

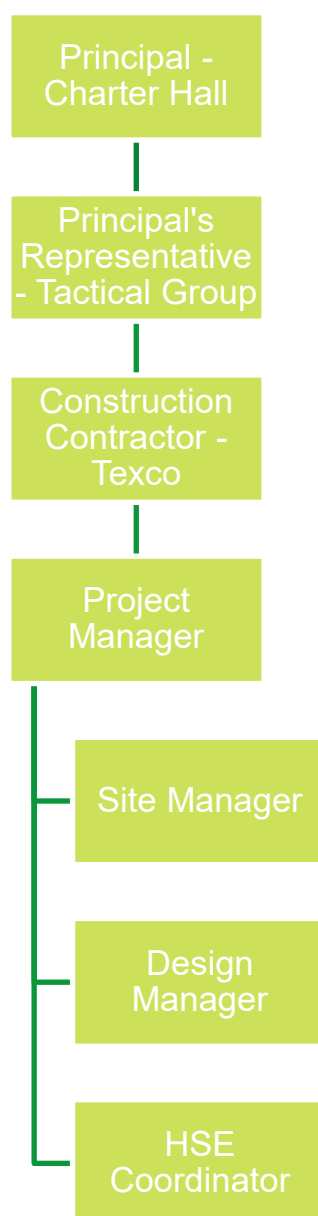


Figure 2-1 Organisational Chart

## 2.5.2 Principal's Representative and Community Engagement Consultant

For the purposes of this CEMP, the Principal's Representative is responsible for reviewing and assessing conformance and compliance of the Construction Contractor's works with the Project requirements.

Table 2-3 Roles and Responsibilities of Principal's Representative

| Role                              | Responsibility                                                                                                                                                                                                                              |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CHARTER HALL (Principal)</b>   | <ul style="list-style-type: none"> <li>Provide advice and leadership on environmental management</li> </ul>                                                                                                                                 |
| <b>Principal's Representative</b> | <ul style="list-style-type: none"> <li>Manage and assist the contractors to meet their environmental responsibilities and minimise the potential for environmental incidents</li> <li>Review the CEMP and sub-plans for adequacy</li> </ul> |

| Role | Responsibility                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <ul style="list-style-type: none"> <li>Review the Construction Contractor's environmental monitoring reports and compliance documentation to confirm that the CEMP and sub-plans are being implemented and remain adequate</li> <li>Issue a stop work direction immediately where an unacceptable environmental impact may occur</li> <li>Liaise with the DPIE and other relevant regulators as required</li> </ul> |

## 2.5.3 Construction Contractor

The indicative roles and responsibilities of Project personnel are outlined below in Table 2-4. The Construction Contractor will provide roles and responsibilities to the Principal's Representative prior to the commencement of construction.

Table 2-4 Construction Contractor's Roles and Responsibilities

| Role (or equivalent)                                  | Key Responsibility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contractor's Project Manager (Contractor's PM)</b> | <ul style="list-style-type: none"> <li>Oversee the implementation and maintenance of the CEMP</li> <li>Report to senior management and the Principal's Representative on the performance of the system and environmental breaches</li> <li>Take action to resolve environmental non-conformances, non-compliances and incidents</li> <li>Demonstrate that suppliers and sub-contractors are implementing Project environmental requirements</li> <li>Report environmental incidents to the Principal's Representative</li> <li>Authorise expenditure to implement environmental management requirements within limits of authority as defined in the Principal's Representatives Project requirements</li> <li>Coordinate Incident Cause Analysis Method (ICAM) investigations</li> <li>Review audit corrective actions and take action as necessary to ensure timely close out of issues</li> <li>Direct works to be performed in a more environmentally responsible manner that reduces impacts or stop works if there is a risk of environmental harm</li> <li>Employ apprentices in trade roles wherever possible.</li> </ul> |
| <b>Contractor's Site Manager (Contractor's SM)</b>    | <ul style="list-style-type: none"> <li>Communicating with all personnel and sub-contractors regarding conformance with the CEMP and site-specific environmental issues/Environmental Work Method Statements</li> <li>Identifying resources and competencies required for implementation of the CEMP</li> <li>Organise and manage site plant, labour and temporary materials</li> <li>Co-ordinating the implementation and maintenance of site environmental controls and provide support for the Contractor's EM</li> <li>Report all environmental incidents in accordance with incident reporting protocol</li> <li>Participate ICAM investigations</li> <li>Take action to resolve non-conformances, non-compliances and incidents</li> <li>Manage and direct works in an environmentally responsible manner that reduces environmental impacts or stop works if there is a risk of environmental harm</li> <li>Managing and minimising water consumption, energy consumption, waste consumption and emission of greenhouse gases, wherever possible.</li> </ul>                                                                |

| Role (or equivalent)                                   | Key Responsibility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contractor's HSE Coordinator (Contractor's HSE)</b> | <ul style="list-style-type: none"> <li>Assist and guide the respective workers to meet their environmental responsibilities and minimise the potential for environmental incidents</li> <li>Undertake regular environmental inspections including against implementation of management measures and environmental controls</li> <li>Report to the Contractor's PM on environmental issues</li> <li>Implement appropriate action to address any environmental incidents</li> <li>Investigate and report on identified non-conformances and non-compliances</li> <li>Ongoing identification and mitigation of environmental risks and notify the Principals Representative of any required change</li> <li>Develop environmental components of site induction and ensure a register of attendance is maintained</li> <li>Present and participate in toolbox meetings</li> <li>Manage environmental document control, reporting, inductions and training</li> <li>Oversee site monitoring, inspections and internal audits</li> <li>Monitor and report on the environmental capability and performance of subcontractors</li> <li>Participate ICAM investigations</li> <li>Report environmental non-conformances, incidents and potential incidents to the Contractor's PM</li> <li>Cooperate and participate in audits and action results of any audit findings.</li> </ul> |
| <b>All Personnel</b>                                   | <ul style="list-style-type: none"> <li>Undertake work activities in a manner that minimises the potential for pollution of land, air, water, community amenity, and/or the generation of waste</li> <li>Take all feasible and reasonable steps to comply with the requirements of this CEMP</li> <li>Comply with lawful management directions to prevent environmental harm or enhance protection of site environmental values</li> <li>Stop works if there is a potential risk of material harm</li> <li>Promptly report to management on any non-conformances, perceived non-compliances, or environmental incidents</li> <li>Undergo induction and training in environmental awareness</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## 2.5.4 Sub-Contractors

All sub-contractors are required to attend Project and / or site inductions where the requirements and obligations of the CEMP will be communicated.

In addition to project wide monitoring, sub-contractors will manage, monitor and report on their environmental performance in accordance with the requirements of this CEMP.

## 2.6 Communication

Clear lines of communication throughout all levels and functions (e.g. management, staff and subcontracted service providers), as well as to key external stakeholders, is key to minimising environmental impacts and achieving continual improvements in environmental performance.



## 2.6.1 Internal Communications

The Contractor's Management Team<sup>1</sup> and Principals Representative will meet at least fortnightly to discuss progress and any issues with environmental management or performance on-site, any amendments to plans that might be required or any new / changes to construction activities. Meeting minutes will be taken and maintained by the Construction Contractor.

Any changes to environmental management, personnel and practice on site will be communicated to Project personnel through the following internal communications:

- Management reports
- Site inspection reports
- Incident notification reports
- Noticeboards
- Site meetings
- Employee induction, training and toolbox sessions
- Briefings, notifications and alerts
- Project reports.

## 2.6.2 External Communications

A Community Consultation and Complaints Handling Procedure (CCCHP) has been developed to facilitate communication between Charter Hall and the key stakeholders, including regulators and the community, during construction of the development. All community liaison must be undertaken in accordance with the CCCHP.

Media inquiries and external communications with DPIE and the EPA are the responsibility of the Principal's Representative. Direct requests from the media to any personnel for information about the Project will be referred directly to the Principal's Representative.

## 2.6.3 Complaints Management

Public complaints shall be logged with the Construction Contractor and are to be responded to in accordance with the CCCHP. Public complaints may be received via:

- Project email – [jcrameri@texco.net.au](mailto:jcrameri@texco.net.au)
- Project information line – 0409 797 567
- Postal address 12.1/160 Bourke Road, Alexandria NSW 2015
- Face to face interactions with Project personnel.

Environmental management-related complaints will be recorded in a complaints register kept by the Construction Contractor.

The complaints register will be forwarded to the Principal's Representative on a monthly basis. Records of complaints will be maintained in accordance with the CCCHP.

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<sup>1</sup> The Contractor's Management Team includes, as a minimum the Contractor's PM, Contractor's SM and Contractor's HSE.

## 2.7 Environmental Training and Competence

### 2.7.1 Training

All Project personnel shall undergo general environmental awareness training and training relevant to their responsibilities under the CEMP. Records of Project environmental induction and other environmental training will be maintained and readily accessible.

#### 2.7.1.1 Project Environmental Induction

All workers and sub-contractors accessing the Project site will receive a site-specific induction that includes details of environmental and compliance obligations. The Contractor's HSE is responsible for developing the site-specific induction and maintaining a register of attendance at the project environmental induction including dates, names of people inducted and trainer details.

All employees (including sub-contractors) will receive induction/ training including, but not limited to, the following:

- Environmental Policy
- Requirements of the CEMP and sub-plans
- Individual authorities and responsibilities
- Site environmental rules and requirements
- Emergency procedure and response (e.g. spill clean-up)
- Location of environmentally sensitive areas and exclusion zones
- Communications and reporting incidents
- Environmental competency requirements for works.
- Heritage considerations
- Potential consequences of departure from rules
- Legal obligations
- Waste management
- Conservation of on-site resources including water, materials, and energy

Site personnel will be informed of their individual responsibility to be proactive and report any instances of environmental control measures not operating properly.

All visitors to the Project site must undergo a visitor's induction. All visitors must be accompanied by Project personnel at all times.

#### 2.7.1.2 Pre-start and Toolbox Talks

Pre-starts will be held on a daily basis by the Site Supervisor and provide the Project personnel with any updates on environmental matters, including any key or recurring environmental issues. Any personnel undertaking works on site must attend a pre-start. The Pre-starts will include requirements of relevant Work Method Statement (WMS) and Environmental Control Maps (ECMs).

Toolbox talks will be undertaken in response to evolving issues on the ground, particularly in response to environmental incidents, non-conformance or non-compliance issues or any changes to the CEMP and environmental management procedures.

Attendance at toolbox talks is mandatory for site personnel and sub-contractors. Specific environmental issues that may be addressed in toolbox talks include:

- Community awareness
- Working with potentially contaminated soils
- Waste management

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- Soil and water management practices
- Unexpected finds (heritage, contamination, flora and fauna)
- Noise minimisation for staff working out of hours
- Incident management, and environmental emergency mock training
- Any other subjects listed in environmental management plans.

### 2.7.1.3 Recommended Environmental Training

A summary of proposed awareness training by environmental aspect is provided in Table 2-5. The training shall be scheduled to reflect works / activities in the construction program and/or as deemed required by the Contractor's HSE from time to time, to address specific occurrences or changes.

The Contractor's HSE is responsible for maintaining a register of environmental training carried out, including dates, names of people trained and details of the training and trainer.

Table 2-5 Indicative Awareness Training by Environmental Aspect

| Aspect                            | Training Inclusion                                                                                                                                                                                                                        | Personnel Required     | Timing / Frequency / Means                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------|
| Emergency spill response          | <ul style="list-style-type: none"> <li>• Use and location of spill kits</li> <li>• Spill control</li> <li>• Emergency response procedures</li> <li>• Spill response drill</li> <li>• Identification of hydraulic hose fatigue.</li> </ul> | Construction personnel | Project induction<br>Project toolbox talks<br>Construction Contractor to provide relevant training         |
| Erosion and sediment control      | <ul style="list-style-type: none"> <li>• Types of erosion and sediment controls</li> <li>• Implementation of erosion and sediment controls on site</li> <li>• Development of ESCPs.</li> </ul>                                            | Construction personnel | Project induction<br>Project toolbox talks<br>Contractor to provide relevant training                      |
| Contamination awareness           | <ul style="list-style-type: none"> <li>• Contamination status of site</li> <li>• Stop works protocols for unexpected contamination (e.g. hydrocarbons and asbestos)</li> <li>• Acid Sulphate Soils</li> </ul>                             | Construction personnel | Project induction<br>Project toolbox talks<br>Protocol distributed to workers and posted on message boards |
| Environmental legal obligations   | <ul style="list-style-type: none"> <li>• POEO Act and other project requirements</li> <li>• Applicable fines and prosecutions.</li> </ul>                                                                                                 | Construction personnel | Project induction<br>Project toolbox talks                                                                 |
| Waste Management                  | <ul style="list-style-type: none"> <li>• Opportunities to minimise waste</li> <li>• Waste disposal requirements and minimisation of litter</li> </ul>                                                                                     | Construction personnel | Project induction<br>Project toolbox talks                                                                 |
| Community / stakeholder awareness | <ul style="list-style-type: none"> <li>• Adjacent community and Project involvement</li> <li>• Relevant Project stakeholders</li> <li>• Accepted behaviours</li> <li>• Approved hours of work.</li> </ul>                                 | Construction personnel | Project induction<br>Project toolbox talks                                                                 |

| Aspect              | Training Inclusion                                                                                                                                                                                                               | Personnel Required     | Timing / Frequency / Means                 |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------|
| Noise and vibration | <ul style="list-style-type: none"> <li>Work hours</li> <li>Management measures to reduce noise and vibration from construction activities</li> <li>EPL requirements</li> <li>POEO Act and other project requirements.</li> </ul> | Construction personnel | Project induction<br>Project toolbox talks |

## 2.7.2 Worker Competency

The Contractor's SM is responsible for identifying the competency needs for the Project and allocating resources for training. Some key competency environmental standards for the Project include:

- Specific hazardous liquid / hazardous waste removal licence
- Vegetation removal and fauna relocation
- Traffic management qualifications
- Asbestos awareness (removal)
- Erosion and sediment control including Volume 1 of Managing Urban Stormwater: Soils and Construction ('Blue Book') (Landcom 2004)
- Air quality, noise and vibration and water quality monitoring
- ICAM.

Records of licences, training and verification of competencies will be documented in a training register and maintained on the Project site.

Evidence of training and competency is to be provided prior to commencement of works by site personnel and contractors, applicable to the tasks to be undertaken.

## 2.8 Emergency Preparedness and Response

An environmental emergency is any event that causes or has the potential to cause material harm to the environment.

Each Construction Contractor must nominate a Site Emergency Contact and an alternate contact that will be available 24-hours a day, seven days a week. The Site Emergency Contact has the authority to stop and direct works. Emergency contact details are included in Table 2-6.

Table 2-6 Emergency Contact Details

| Contact Name              | Telephone Number                                         | Address |
|---------------------------|----------------------------------------------------------|---------|
| Ambulance                 | 000                                                      | N/A     |
| Fire Brigade              | 000                                                      | N/A     |
| Police                    | 000                                                      | N/A     |
| NSW EPA Pollution Hotline | 131 555 or (02) 9995 5555 (if calling from outside NSW). | N/A     |
| Ministry of Health        | (02) 9391 9000                                           | N/A     |

| Contact Name               | Telephone Number                                                                                                                                                                      | Address                                     |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| SafeWork NSW               | 13 10 50                                                                                                                                                                              | N/A                                         |
| Campbelltown City Council  | Customer Contact Centre for NSW residents: 1300 36 2170<br>Calling from interstate: (02) 9821 9222<br>National Relay Service (NRS) for hearing and speech impaired customers: 133 677 | Campbelltown                                |
| Rural Fire Service         | 9603 7077                                                                                                                                                                             | Cnr Alderney St and Townson Ave, Minto 2566 |
| Principal's Representative | Tactical Group                                                                                                                                                                        | Contact details to be confirmed             |
| Contractor's PM            | Justin Crameri                                                                                                                                                                        | Nominated 24-hour contact                   |
| Contractor's SM            | Anthony Buterin                                                                                                                                                                       | Nominated 24-hour contact                   |
| Contractor's HSE           | Sayre Stewart                                                                                                                                                                         | Back-up 24-hour contact                     |

## 2.8.1 Incident Classification and Notification

An incident is defined within the CoC as 'a set of circumstances causing or threatening material harm to the environment, and/or an exceedance of the limits or performance criteria in this consent'. Environmental incidents include pollution incidents and environmental emergencies and may arise from natural (e.g. storm, wind or bushfire) or human factors. Note that non-conformances and non-compliances are addressed separately in Section 4.4.

A pollution incident is an incident or set of circumstances during or as a consequence of, which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises. It does not include an incident or set of circumstances involving only the emission of any noise (POEO Act).

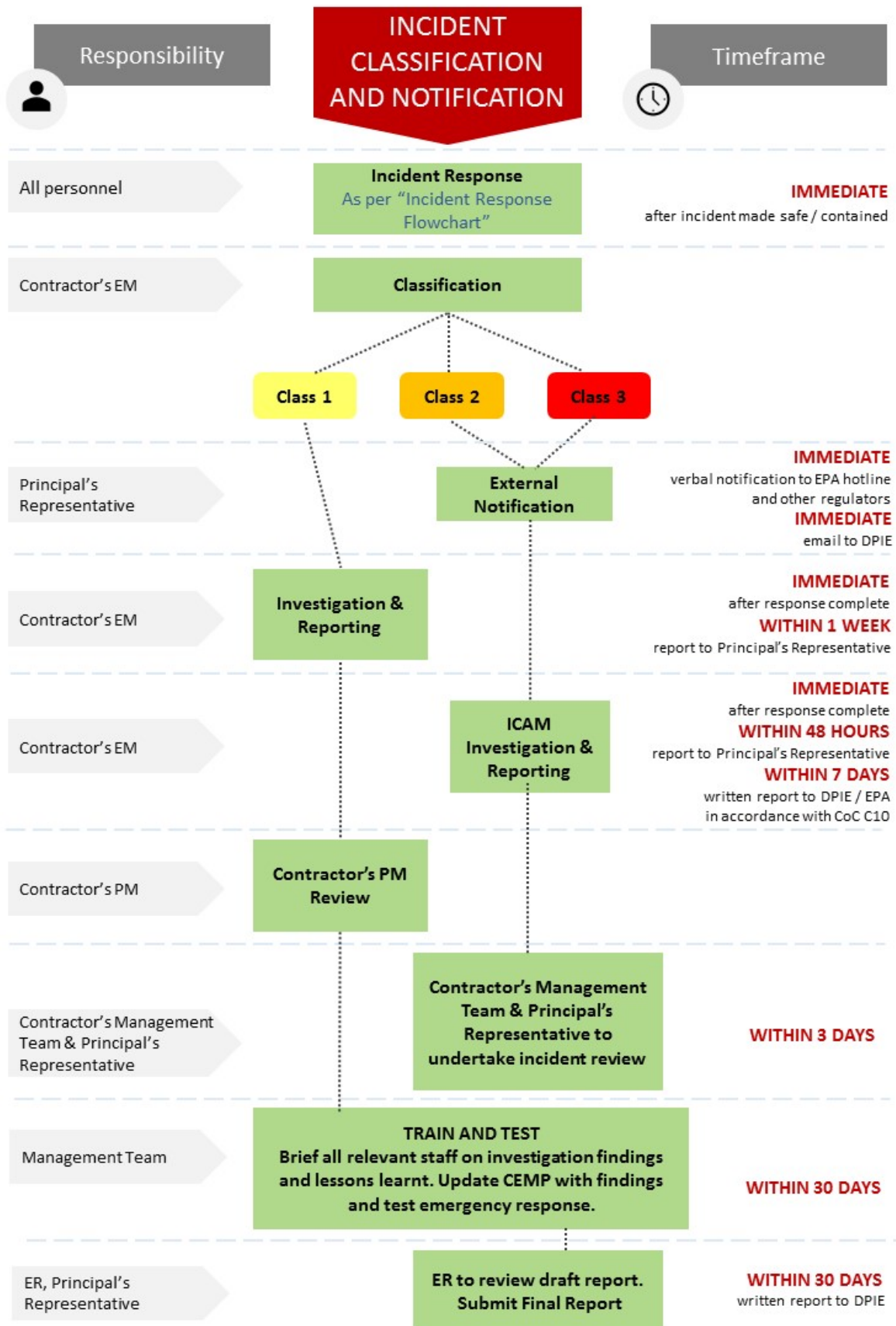


Figure 2-2 Environmental Incident Classification and Notification

Additional clarifications on the environmental incident classification and notification process for the Construction Contractor are as follows:

- Incidents will be classified into one of three classes as per Table 2-7. The Contractor's HSE is responsible for the classification of incidents in consultation with the Principal's Representative
- For actual or potential Class 2 and 3 environmental incidents the Contractor's HSE will immediately inform the Principal's Representative
- An ICAM certified person must complete a detailed ICAM investigation for actual or potential Class 2 and 3 environmental incidents
- Designated personnel to implement corrective and preventative actions.

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Table 2-7 Environmental Incident Classification

|                                 | Class One                                                                                                                                                                                                                                                                                                                                                                                               | Class Two (including potential)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Class Three (including potential)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Direct costs including clean up | Up to \$10,000                                                                                                                                                                                                                                                                                                                                                                                          | \$10,000 to \$100,000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | More than \$100,000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Impact                          | <p>Potential or actual material harm such as:</p> <ul style="list-style-type: none"> <li>Pollution or degradation which has low severity impacts on the community and/or environment in the short-term (&lt;1 month duration) and is fully reversible with no residual impacts</li> <li>Harming a protected animal that is not vulnerable or threatened.</li> <li>Discarding a lit cigarette</li> </ul> | <p>Material harm such as:</p> <ul style="list-style-type: none"> <li>Pollution or degradation which has moderate severity impacts on the community and/or environment (1-3 months duration) but is fully reversible with no residual impacts</li> <li>Harming an animal that is (or is part of) a vulnerable species or vulnerable ecological community</li> <li>Picking a plant that is (or is part of) a vulnerable species or vulnerable ecological community</li> <li>Discarding a lit cigarette during a total fire ban</li> </ul> | <p>Material harm such as:</p> <ul style="list-style-type: none"> <li>Pollution or degradation which has high severity impacts on the community and/or environment and may have irreversible residual impacts</li> <li>Harming an animal that is (or is part of) a threatened species or threatened ecological community (other than a vulnerable species or community) (S2.1)</li> <li>Picking a plant that is (or is part of) a threatened species or threatened ecological community (other than a vulnerable species or community)</li> <li>Damaging a declared area of outstanding biodiversity value</li> <li>Knowingly damaging any habitat of a threatened species or threatened ecological community</li> <li>Contravention of a stop work order.</li> <li>Permitting a fire to escape causing injury or damage to person, land or property of the Crown or a public authority.</li> </ul> |



## 2.8.2 Incident Response

All environmental incidents will be managed in accordance with the flowchart shown in Figure 2-3.

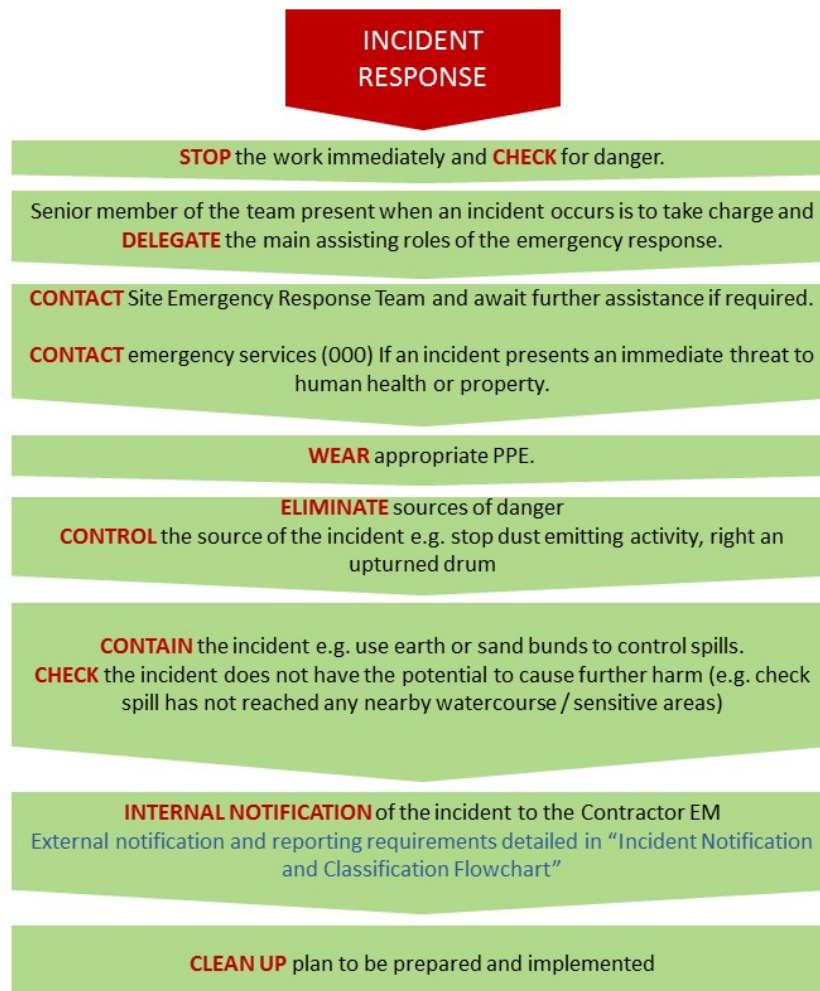


Figure 2-3 Environmental Incident Response Flowchart

## 2.8.3 External Notification

All environmental incidents are to be reported and managed in accordance with Texco's Incident Reporting and Management procedure. Environmental incidents will be classified and notified in accordance with Figure 2-2.

### 2.8.3.1 Environmental Protection Authority

In accordance with the POEO Act, the Principal's Representative will immediately notify the EPA of all actual or potential Class 2 and Class 3 incidents via the EPA Environment Line (131 555).

The notification to the EPA will need to include information on:

- The time, date, nature, duration and location of the incident
- The location of the place where pollution is occurring or is likely to occur
- The nature, the estimated quantity or volume and the concentration of any pollutants involved
- The circumstances in which the incident occurred (including the cause of the incident, if known)
- The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution

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- Other information prescribed by the regulations.

In addition to notifying the EPA of pollution incidents, the Principal's Representative Project Management Team will also immediately notify other relevant regulatory authorities as outlined below:

- The Ministry of Health (via the local Public Health Unit – 02 9391 9000)
- The WorkCover Authority – 13 10 50
- Campbelltown City Council – 02 4645 4000
- Fire and Rescue NSW – 000.

These authorities must be notified for all notifiable pollution incidents under Section 148 of the POEO Act 1997. Further information in relation to the incident must be provided immediately if it becomes available after the initial notification.

### 2.8.3.2 DPIE

DPIE will be notified in writing ([compliance@planning.nsw.gov.au](mailto:compliance@planning.nsw.gov.au)) immediately upon the Principal's Representative becoming aware of an incident that causes or threatens to cause material harm (as defined by the Development Consent).

A written incident notification must be provided to the Secretary within seven days of the date on which the incident occurred.

In accordance with CoC 10, within 7 days of the date on which the incident occurred, an incident report must be submitted to the Planning Secretary.

All external notification of environmental incidents will be undertaken by the Principal's Representative Project Management Team

Records of contact with and details of the information provided to external authorities must be maintained in the project records. Any contact with the regulatory authorities will be logged using Aconex.

### 2.8.4 Incident Review

Actual and potential Class 1 incidents will be reviewed by the Contractor's HSE and notified to the Principal's Representative.

Actual or potential Class 2 or 3 incidents will be reviewed by the Contractor's Management Team and the Principal's Representative.

Actual or potential Class 2 or 3 incidents will be reviewed by the Contractor's HSW who will immediately notify the Principal's Representative. The Principal's Representative will undertake external notification as required.

Within three days of a potential or actual Class 2 or 3 incident, the Contractor's HSE will convene a briefing with the Contractor's Management Team and Principal's Representative to provide an update on the incident investigation.

The following information relating to the incident investigation shall be documented:

- The condition of the environment and the status of any rectification or remediation works
- The completed ICAM report, including appropriate causal analysis and corrective actions
- Program for the implementation of the corrective actions and any maintenance activities
- Incorporation of any requirements of regulatory agencies as a result of external notification
- Any other relevant information.

Any written requirements of the Secretary (or relevant public authority) that may be given to address the cause or impact of an incident will be complied with.

The Contractor's HSE will provide the Principal's Representative evidence to show the recommendations from the ICAM have been implemented.

### 3 IMPLEMENTATION

This section addresses the key risks associated with the Project and the environmental controls established to manage them.

#### 3.1 Aspects, Impacts and Risk Management

Project-wide environmental aspects, impacts and opportunities have been identified and assessed in accordance with the risk assessment as presented in the Proposed Warehouse and Logistics Hub EIS. The key environmental aspects and impacts for the Project as they relate to construction, include:

- Construction traffic impacts on local roads surrounding construction worksites
- Noise and vibration impacts on surrounding residents and businesses
- Diminishing air quality through construction vehicle emissions and dust generation
- Pollution of adjacent waterways from water discharge and/or spills from worksites
- Adverse flood impacts and increases in stormwater discharge
- Erosion and sedimentation due to ground disturbance, temporary stockpiling and construction of internal roads and structures
- Discovery of unidentified contaminated soils
- Visual impacts of temporary construction worksites on surrounding residences and businesses
- Discovery of unidentified Aboriginal or non-Aboriginal heritage.

#### 3.2 Environmental Management Activities and Controls

Environmental management measures to be implemented during construction of the Project to ensure compliance with relevant statutory requirements, limits, performance measures and criteria are documented in the aspect specific CEMP sub-plans. Other measures to manage environmental impacts include ECMs, environmental hold points, WMS and environmental forms.

##### 3.2.1 Environmental Control Maps (ECMs)

The key environmental constraints for the Project are identified in the sub-plans and captured spatially in ECMs. Key environmental constraints include:

- Project boundaries (neighbouring properties)
- Sensitive receivers (e.g. watercourses)
- Location of site offices.

The ECMs must be available in hard copy format in the Construction Contractor's site office. The content of the ECMs must be included in the site induction and covered in pre-starts prior to works adjacent to identified environmental values.

##### 3.2.2 Work Method Statements

WMSs will be prepared by the Construction Contractor to manage and control activities that have the potential to impact on the community, safety or environment where relevant prior to the commencement of relevant construction activities.

A specific WMS will be developed for demolition. This will follow the Methods of Demolition as outlined in AS2601 – 2001, including general precautions, measures for damaged buildings, removal of any hazardous substances, sequencing, induced collapsing and air quality protection during demolition works.

### 3.2.3 Specific Environmental Control Measures

#### 3.2.3.1 Imported Material

It is a requirement that all fill/soil imported to the site for site preparation is deemed to be Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM) or other material approved in writing by the EPA. Certification of VENM or ENM is to be provided by the supplier. Certification records, source and volume of the material will be kept in a register for imported soils. In addition to this, records will be kept onsite of where imported fill material is placed on the project site. This information is to be made available to DPIE on request.

#### 3.2.3.2 Air Quality

Demolition and earthmoving activities have the potential to generate dust and impact neighbouring properties, users and sensitive environments. A number of air quality management measures are to be implemented during the project. These include:

- Making contact with neighbouring properties prior to the commencement of construction, including potential dust-generating activities
- Minimising the area of disturbance as far as practicable during works
- Stabilising and revegetating disturbance areas as soon as works are completed
- Ensuring there is a complaints handling procedure
- Visual monitoring of dust generation during the project
- Minimising drop heights during unloading of materials
- Keeping exposed surfaces moist to suppress dust
- Limiting vehicle speeds to below 30 km/h
- Ensuring that trucks entering and existing the site are covered and do not track dust onto public roads

#### 3.2.3.3 Unexpected Heritage Finds

There is a low likelihood that either Aboriginal or European heritage items exist on the Development site. Notwithstanding this, in the event that potential archaeological finds are discovered during construction, works will stop immediately, and the PM will be made aware. The Office of OEH, Campbelltown City Council and Tharawal Aboriginal Land Council will be contacted in accordance with the Community Engagement and Complaints Handling Procedure to assess and take appropriate measures.

#### 3.2.3.4 Dangerous Goods, Chemicals, Fuels and Oils

Dangerous goods such as flammable liquids will be used during the project, e.g. petrol. These materials will be handled and stored in accordance with the relevant Australian Standards. A specific WMS will be developed for each class of dangerous good used on the project, outlining handling and storage requirements.

All fuels, chemicals and oils will be stored in appropriately bunded areas in accordance with AS1940-2004. Where necessary, chemicals will be stored separately to other liquids such as fuels. Details on this will be recorded in the relevant WMS.

### 3.2.4 Environmental Forms

Each Construction Contractor is required to prepare their own environmental monitoring or management forms and checklists, relevant to their works. Where forms or checklists have been included within this CEMP or sub-plans, these are indicative and can be replaced with contractor specific-forms. The relevant Construction Contractor must provide environmental and sustainability forms, registers and/or checklists to the Principal's Representative for review prior to commencement of works. The Construction Contractor specific forms, registers and/or checklists must include the relevant minimum specific content within.

## CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

At a minimum, the following are to be developed:

- Project induction and training register / records
- Weekly environmental inspection
- Water discharge permit
- Noise and vibration monitoring form
- Air quality monitoring form
- Water quality monitoring form
- Waste tracking spreadsheet
- Pre-clearing checklist
- Energy consumption register
- Water consumption register
- Materials register (including material specifications)
- Clearing permit
- Corrective actions register
- Incident register
- Complaints form.

## 4 MONITOR AND REVIEW

### 4.1 Environmental Monitoring

Environmental monitoring will be undertaken to assist in the management of the following:

- Construction of the Project in accordance with environmental approvals
- Compliance with all relevant legislative requirements
- The minimisation of potential environmental incidents
- Effectiveness of environmental controls
- Implementation of this CEMP.

Monitoring requirements under the Development Consent are included in the relevant sub-plans. Where relevant, the sub-plan will provide detail on the following:

- Responsibility for monitoring
- Relevant standards applicable to the monitoring
- Monitoring technique
- Monitoring location and installation requirements
- Frequency of monitoring
- Sample collection requirements, including chain of custody
- Calibration and maintenance requirements of equipment
- Data management, review and distribution.

### 4.2 Observations and Inspections

#### 4.2.1 Daily Observations

A daily pre-start on plant and equipment will be undertaken and any leaks, environmental hazards or excessive emissions reported to the Contractor's HSE.

Site environmental controls will be inspected daily by the Contractor's HSE or their delegate. Each work team must inspect the environmental controls as relevant to their work area.

#### 4.2.2 Inspections

Table 4-1 provides a summary of the minimum inspections that will be undertaken for the Project.

Table 4-1 Inspection Summary

| Inspection Type                       | Frequency           | Focus                                                             | Responsibility             | Record                            |
|---------------------------------------|---------------------|-------------------------------------------------------------------|----------------------------|-----------------------------------|
| Environment site inspection           | Weekly              | Relevant social and environmental aspects related to works period | Contractor's HSE           | Inspection log / report           |
| Rainfall and pre-shutdown inspection  | Detailed within SMP | Erosion and sediment controls                                     | Contractor's HSE           | Inspection log / report           |
| Principal's Representative Inspection | Monthly             | Compliance with CoC                                               | Principal's Representative | Principal's Representative Report |

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The weekly environment inspections, undertaken by the Construction Contractor, will cover the environmental aspects of the Project which are relevant to the stage of works being undertaken. The purpose of these inspections is to:

- Determine compliance with CoC
- Determine conformance with management measures detailed within sub-plans
- Review the performance and effectiveness of environmental controls
- Identify non-conformance to expected performance levels or implementation of controls expected under this CEMP and the respective sub-plans
- Document observations and track performance.

The Construction Contractor will develop and use an environment inspection checklist to document performance and identify potential issues on site. Any corrective actions undertaken are required to be documented, in accordance with the requirements described in Section 4.4.

Weekly inspection checklists will be forwarded to the Principal's Representative through Aconex.

### 4.3 Environmental Auditing

#### 4.3.1 Internal Audits

The first internal audit of the Construction Contractor will be undertaken by the Principal's Representative within six months of the commencement of construction.

Internal audits will be undertaken annually thereafter, providing further stages of the development continue after Stages 1 and 2. The audit scope will be determined by the auditor based on current site activities.

### 4.4 Non-conformance, Non-compliance and Actions

#### 4.4.1 Non-conformances

Non-conformances are observations or actions that are not in accordance with the CEMP and the aspect specific sub-plan. These are not recorded as non-compliances as there may be activity-specific justification for a change in implementation of the requirements of the management plan.

Where a non-conformance is also considered to represent a possible non-compliance, it is to be recorded as a potential non-compliance. Depending upon the nature of the non-conformance, the non-conformance may require reporting to the DPIE as an incident (CoC C9 and CoC C10).

It is the responsibility of all personnel to report non-conformances to their Site Supervisor and / or the Contractor's HSE. The Contractor's HSE will investigate non-conformances, log corrective actions, and delegate responsibility for corrective actions within assigned timeframes.

Non-conformances with the implementation of the CEMP and sub-plans shall be investigated to determine the root cause and any corrective and/or preventative actions arising. This will be reported to the Principal's Representative in a Non-Conformance/NCR and any corrective and/or preventative actions will be recorded within the Project Corrective Actions Register to be developed by the Construction Contractor and handled in accordance with the Environmental Management System – Improvement Notice (EHS – 9.16) and Non-conformance Register (EHS – 1.1.05).

#### 4.4.2 Non-compliances

A non-compliance is a breach of relevant conditions of consent but does not relate to a specific incident. Incident response, classification and notification requirements are outlined in Section 2.8.

Potential non-compliances with the CoC can be identified by anyone and are to be reported to the Contractor's HSE as a potential non-compliance. Whether the occurrence, set of circumstances, or



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development requires to be notified to the DPIE as a non-compliance is the responsibility of the project management team.

Non-compliance with the CoC shall be investigated to determine the root cause and any corrective and/or preventative actions arising. This will be reported to the Principal's Representative in a Non-Conformance/NCR and any corrective and/or preventative actions will be recorded within the Project Corrective Actions Register to be developed by the Construction Contractor and handled in accordance with the Environmental Management System – Improvement Notice (EHS – 9.16) and Non-conformance Register (EHS – 1.1.05). Non-compliances shall be recorded and addressed through Aconex.

DPIE will be notified in writing to [compliance@planning.nsw.gov.au](mailto:compliance@planning.nsw.gov.au) within seven days after the Project becomes aware of any non-compliance (CoC C9 and C10). The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply, the reasons for the non-compliance (if known), and what actions have been, or will be, undertaken to address the non-compliance.

### 4.4.3 Corrective and Preventative Actions Register

Corrective and preventative actions will be logged into a register which will be used to verify the close out of an NCR. Additionally, the register will also be used to identify opportunities for improvement.

The nominated timeframes to resolve corrective actions are detailed in Table 4-2.

Table 4-2 Corrective Actions Timeframe for Resolution

| Risk Ranking | Timeframe                                                     |
|--------------|---------------------------------------------------------------|
| 1            | Action needs to be commenced immediately to resolve the issue |
| 2            | Action needs to be resolved within 1 week                     |
| 3            | Action needs to be resolved within 1 month                    |

Trends relating to environmental incidents, non-compliance or non-conformance findings will be reviewed at the Construction Contractor's Management Team meetings to identify any recurring or systemic issues that are indicative of the need to take preventative action.

## 4.5 Management Review

The Contractor's Management Team and Principal's Representative will review the adequacy of the environmental controls and procedures within the CEMP as well as the effectiveness of their implementation to determine whether they are still applicable to the activities being carried out on site.

The management review will be minuted. Changes to the plan will be made by the Principal's Representative and submitted for approval as per Section 1.1.3.

## 4.6 Environmental Reporting

Reporting requirements for the project include but are not limited to:

- Incident reports
- ER monthly reports
- NCR
- Compliance reports
- Inspection reports
- Internal and external audit reports



**APPENDIX A – STANDARDS AND GUIDELINES**

## **SSD7500, Construction Environmental Management Plan – Standards and Guidelines**

Compliance with relevant legislation and industry best practice is often achieved through the adherence to relevant guidelines and standards. Guidelines and standards used during the compilation of this CEMP and aspect specific CEMP sub-plans include but are not limited to those detailed below.

Where updated or revised versions of guidelines, protocols, Standards or policies, or a replacement of them are available, the most recent versions should be applicable to this Plan.

### **Standards**

- AS1940 - The Storage and Handling of Flammable and Combustible Liquids
- AS2601 - The Demolition of Structures
- AS3580.9.3 - Methods for sampling and analysis of ambient air Method 9.3: Determination of suspended particulate matter - Total suspended particulate matter (TSP) - High volume sampler gravimetric method
- AS3580.10.1 - Methods for sampling and analysis of ambient air – Determination of particulates – Deposited matter – Gravimetric Method
- AS/NZS ISO 14001 - Environmental Management Systems

### **Guidelines**

- DECC June 2007 – Local Government Air Quality Toolkit, Visual Guide: Dust from urban construction sites (DECC 2007)
- Environmental Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (EPA 1997)
- Guideline for the Preparation of Environmental Management Plans (DIPNR 2004)
- National Environment Protection Council 2016 – Ambient Air: National Environment Protection Measure for Ambient Air Quality
- NSW EPA 2006 Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (2006)
- Storing and Handling Liquids: Environmental Protection – Participants Handbook (EPA)

**APPENDIX B – CONSTRUCTION TRAFFIC MANAGEMENT  
PLAN**



# **Construction Traffic Management Plan**

Proposed Industrial Development

5-9 Culverston Road, Minto

10/03/2022

P1950r01v6

## Document Control

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|-----------------------|------------------------------------------------------------------|
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| 03           | 31/01/2022 | -       | W. Zheng            | W. Zheng    |
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| 05           | 10/03/2022 | -       | W. Zheng            | W. Zheng    |
| 06           | 10/03/2022 | -       | W. Zheng            | W. Zheng    |

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# 1 Introduction

## 1.1 Introduction

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Ason Group have been engaged by Texco to prepare a Construction Traffic Management Plan (CTMP) for the construction of Stages 1 and 2 of a proposed warehouse and logistics hub, located at 5-9 Culverston Road, Minto (the Site).

This CTMP details the measures and strategies to be undertaken during construction to minimise the effects of work on the surrounding road network, and to ensure the safety and efficiency of the community, all workers, and all road users.

A Construction Environmental Management Plan (CEMP) has been prepared by Texco.

## 1.2 Project Representatives & Stakeholders

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This report has been prepared by a consultant who holds a SafeWork NSW Work Health & Safety Traffic Control Work card, accredited for the 'Prepare a Work Zone Traffic Management Plan'. Details of the accredited consultant is provided below:

- Dora Choi Ticket No. TCT0021456



- Wendy Zheng Ticket No. TCT1015144



This Construction Traffic Management Plan has been prepared to meet the requirements outlined in Appendix A and Appendix E, Section E.2 of the Transport for NSW Traffic Control at Work Sites Technical Manual (Issue No. 6, 2020).

Through the preparation of this CTMP, the project representatives and stakeholders consulted in the development of the traffic management strategy are listed below:



**TABLE 1: PROJECT REPRESENTATIVES AND STAKEHOLDERS**

| Name           | Organisation | Role                                            |
|----------------|--------------|-------------------------------------------------|
| Justin Crameri | Texco        | NSW State Manager                               |
| Dora Choi      | Ason Group   | Principal Lead: Traffic Management & Operations |
| Wendy Zheng    | Ason Group   | Senior Traffic Design Engineer                  |

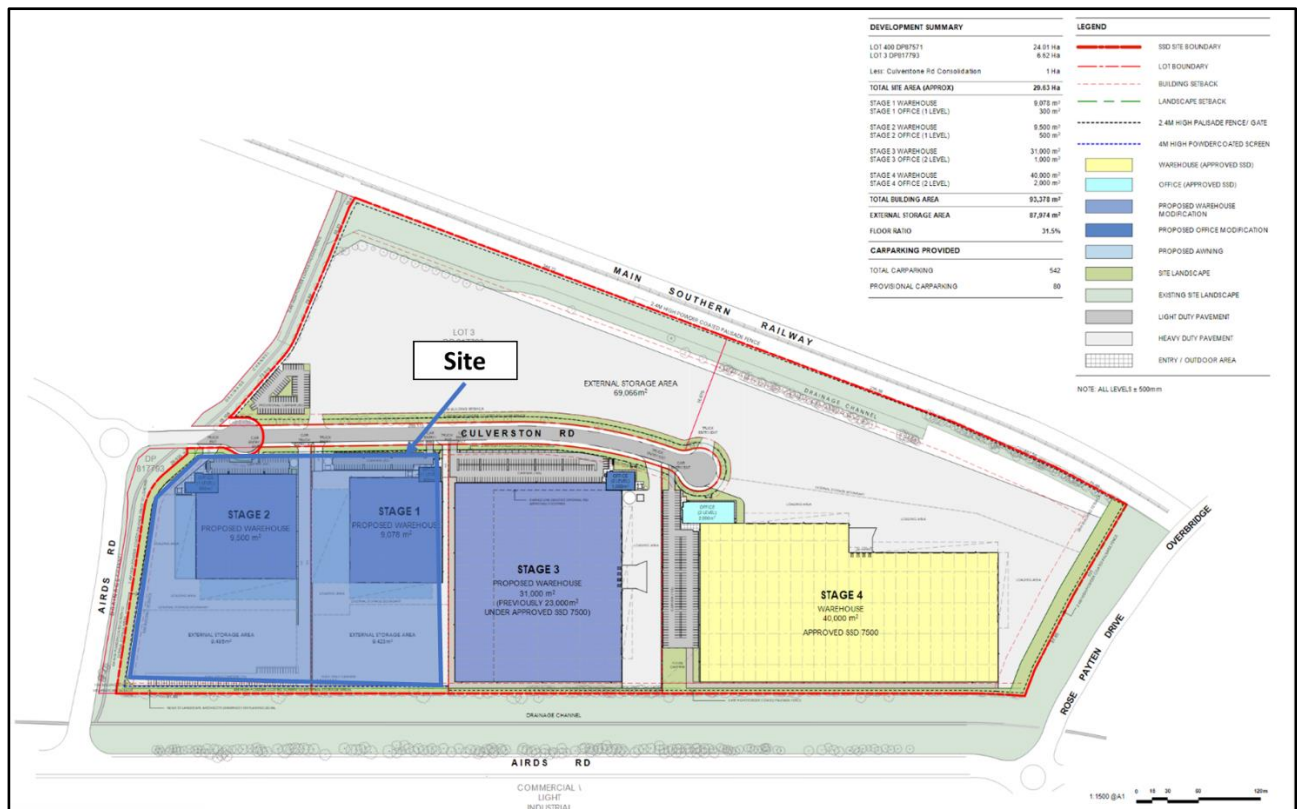
## 1.3 Project Details

The project involves the construction of Stages 1 and 2 which consists of warehouses with ancillary offices, external hardstand storage spaces and car parking spaces at 5-9 Culverston Road, Minto. The warehouses will be constructed concurrently with each other. The breakdown for the construction works is as follows:

- Stage 1 (formerly Warehouse 1C, Stage 2)
  - 9,078m<sup>2</sup> of warehouse GFA and 300m<sup>2</sup> of office GFA; and
  - 9,423m<sup>2</sup> of external storage area.
- Stage 2 (formerly Warehouse 1B, Stage 2)
  - 9,500m<sup>2</sup> of warehouse GFA and 500m<sup>2</sup> of office GFA; and
  - 9,485m<sup>2</sup> of external storage area.

In relation to car parking spaces, the construction works include:

- 505 car parking spaces



### 1.3.1 Proposed Construction Activity / Works

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The proposed construction activities for Stages 1 and 2 will be performed concurrently with each other and is set for completion in November 2022. The description of works is seen in **Table 2**.

**TABLE 2: STAGING AND DURATION OF WORKS**

| Stage | Duration  | Description                                                                                              |
|-------|-----------|----------------------------------------------------------------------------------------------------------|
| 1     | 9 Months  | Demolition and bulk earthworks are expected to take 2 months. The construction will take 7 months.       |
| 2     | 10 Months | Demolition and bulk earthworks will be performed alongside Stage 1. The construction will take 7 months. |

### 1.3.2 Site Location

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The Site is located on 5-9 Culverston Road, Minto and is legally known as Lot 400 DP 875711 and Lot 3 DP 817793. It is located approximately 3 kilometres northwest of Campbelltown, 30 kilometres southwest of the Parramatta CBD and 40 kilometres southwest of the Sydney CBD, within the Campbelltown Council. It has an overall site area of approximately 29.6 hectares and generally occupies the area to the immediate north of Rose Payten Drive, with Airds Road to the west and the rail corridor to the east.

The location of the Site is presented below in **Figure 2**.





Figure 2: Site Location

## 1.4 Authority Requirements

The proposed development received a Development Consent for Application No. SSD-7500 from the Minister for Planning and Public Spaces (NSW Government – Department of Planning, Industry and Environment) on 23 June 2017.

A detailed Construction Traffic Management Plan (CTMP) is required to be prepared and maintained throughout construction to manage construction impacts on the surrounding road network.

Condition B1 of the SSD-7500 required the preparation and submission of a Construction Traffic Management Plan (CTMP) prior to commencement of construction. The condition specified the following:

*“Prior to the commencement of construction, the Applicant must prepare a Construction Traffic Management Plan (CTMP) for the Development to describe the management of traffic and access arrangements during construction. The CTMP shall form part of the CEMP required by Condition C2 and must at a minimum:*

- (a) Be prepared by a suitably qualified and experienced person(s), in consultation with Council and RMS;
- (b) Be submitted to the satisfaction of the Secretary prior to the commencement of construction;
- (c) Detail the measures that would be implemented to ensure road safety and network efficiency during earthworks and construction;
- (d) Detail heavy vehicle routes, access and parking arrangements;
- (e) Include a Driver Code of Conduct to:
  - (i) minimise the impacts of earthworks and construction on the local and regional road network;
  - (ii) minimise conflicts with other road users;
  - (iii) minimise road traffic noise; and
  - (iv) ensure truck drivers use specified routes;
- (f) include a program to monitor the effectiveness of these measures; and
- (g) if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes."

This CTMP forms part of the CEMP and outlines the proposed construction traffic management arrangements associated with the construction stages for the development.

**TABLE 3: RESPONSE TO SSD-7500 CONDITION B1**

| Condition No. | Condition                                                                                                                                                                                                                                                                                                                                               | Response                                                                                           |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>B1 a)</b>  | Be prepared by a suitably qualified and experienced person(s), in consultation with Council and RMS;                                                                                                                                                                                                                                                    | Refer to Section 1.2 and Appendix D for qualifications.<br>Refer to Section 1.6.3 for consultation |
| <b>B1 b)</b>  | Be submitted to the satisfaction of the Secretary prior to the commencement of construction;                                                                                                                                                                                                                                                            | Undertaken by contractor                                                                           |
| <b>B1 c)</b>  | Detail the measures that would be implemented to ensure road safety and network efficiency during earthworks and construction;                                                                                                                                                                                                                          | Refer to Section 3                                                                                 |
| <b>B1 d)</b>  | Detail heavy vehicle routes, access and parking arrangements;                                                                                                                                                                                                                                                                                           | Refer to Sections 2.3, 2.6 and 3.2                                                                 |
| <b>B1 e)</b>  | Include a Driver Code of Conduct to: <ul style="list-style-type: none"> <li>(i) minimise the impacts of earthworks and construction on the local and regional road network;</li> <li>(ii) minimise conflicts with other road users;</li> <li>(iii) minimise road traffic noise; and</li> <li>(iv) ensure truck drivers use specified routes;</li> </ul> | Refer to Appendix A                                                                                |



|               |                                                                                                                                               |                        |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>B16 f)</b> | include a program to monitor the effectiveness of these measures; and                                                                         | Refer to Section 4     |
| <b>B16 g)</b> | if necessary, detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.” | Refer to Section 1.6.2 |

## 1.5 Site Related Data

### 1.5.1 Road Details

The key roads surrounding the Site are as identified within **Figure 2** and summarised in **Table 4**.

**TABLE 4: LOCAL ROAD NETWORK**

| Road Name                | Section                        | Speed Limit | Parking                                                            | Traffic Volumes and Peak Times               | Urban / Rural |
|--------------------------|--------------------------------|-------------|--------------------------------------------------------------------|----------------------------------------------|---------------|
| <b>Culverston Road</b>   | Airds Rd & cul - de-sac        | 50 km/hr    | Untimed Parking<br>Yes / No<br>Yes - Parking width / configuration | AM Peak: 17 veh/hr<br>PM Peak: 66 veh/hr     | Urban         |
| <b>Airds Road</b>        | Rose Payten Dr & Ben Lomond Rd | 60 km/hr    | Untimed                                                            | AM Peak: 620 veh/hr<br>PM Peak: 446 veh/hr   | Urban         |
| <b>Ben Lomond Road</b>   | Campbelltown Rd & Pembroke Rd  | 60 km/hr    | No                                                                 | -                                            | Urban         |
| <b>Pembroke Road</b>     | Ben Lomond Rd & Rose Payten Dr | 60 km/hr    | Untimed                                                            | -                                            | Urban         |
| <b>Rose Payten Drive</b> | Pembroke Rd & Campbelltown Rd  | 60 km/hr    | No                                                                 | AM Peak: 1531 veh/hr<br>PM Peak: 1449 veh/hr | Urban         |
| <b>Campbelltown Road</b> | Rose Payten Dr & Raby Rd       | 70km/hr     | No                                                                 | AM Peak: 1450 veh/hr<br>PM Peak: 1475 veh/hr | Urban         |
| <b>Hume Motorway</b>     | -                              | 70km/hr     | No                                                                 | 2021 ADT: 29,056 veh/day                     | Urban         |

## 1.5.2 Crash History

A review of RMS crash database has been undertaken to establish the crash history in the vicinity of the Site; the crash history for the 5-year period 2016 to 2020 (inclusive) is outlined below in **Figure 3** and **Table 5**.

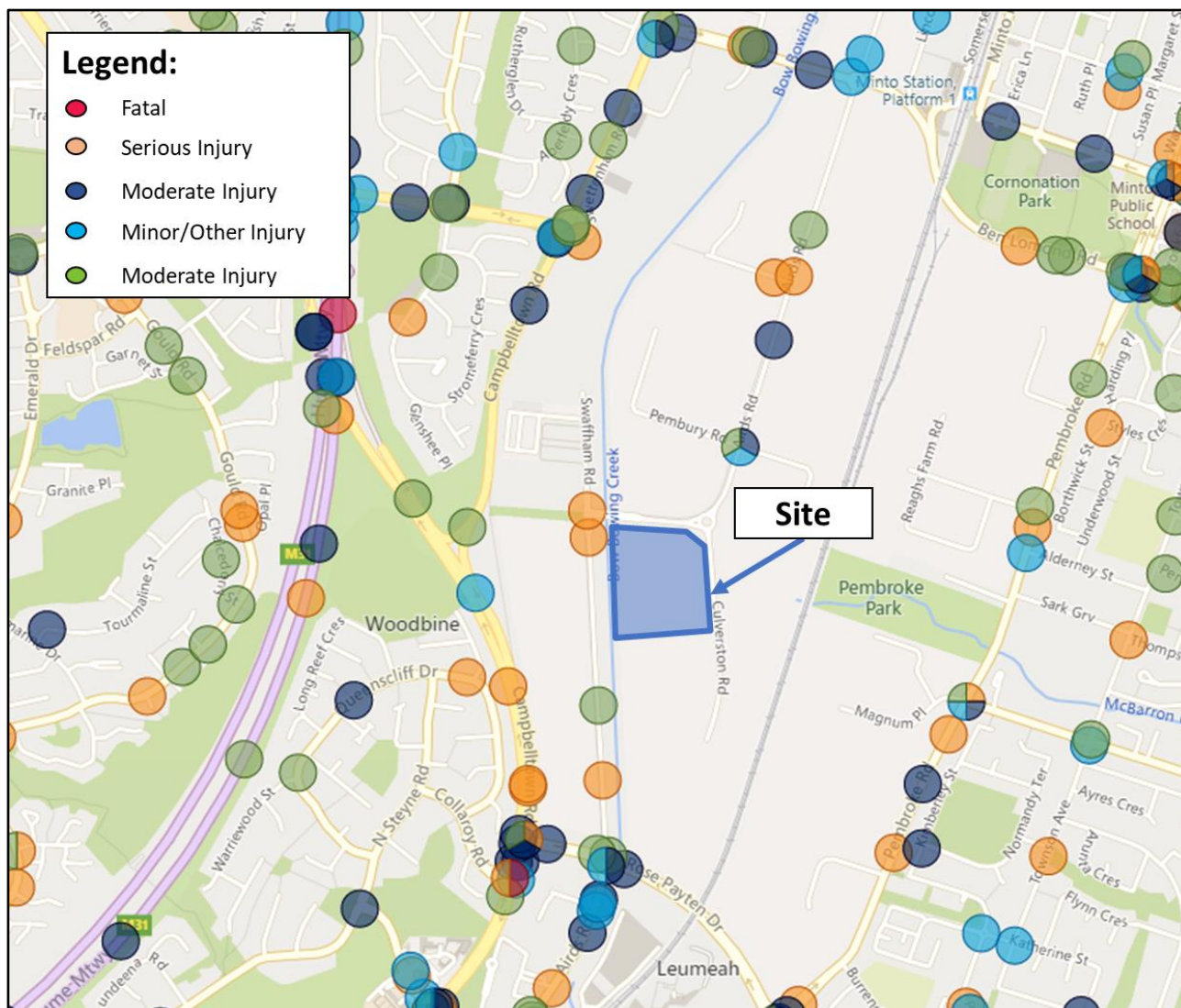


Figure 3: Crash History Surrounding the Site

Of those crashes, the ones that occurred on Airds Rd near the Site can be seen below.

**TABLE 5: CRASH HISTORY**

| Year | Location                                   | RUM Code <sup>1</sup>                                  | Injury/Death |
|------|--------------------------------------------|--------------------------------------------------------|--------------|
| 2016 | Airds Road, West of Site                   | 71 – Left Off Carriageway into Object / Parked Vehicle | nil          |
|      | Airds Road, West of Site                   | 36 – Right Turn Side Swipe                             | 1 x Injury   |
|      | Airds Road and Huntsmore Road Intersection | 10 – Cross Traffic                                     | 3 x Injury   |

|      |                                                        |                                                        |            |
|------|--------------------------------------------------------|--------------------------------------------------------|------------|
| 2017 | Airds Road, West of Site                               | 71 – Left Off Carriageway into Object / Parked Vehicle | 1 x Injury |
|      | Airds Road, West of Site                               | 71 – Left Off Carriageway into Object / Parked Vehicle | 1 x Injury |
|      | Airds Road and Huntsmore Road Intersection             | 36 – Right Turn Side Swipe                             | nil        |
| 2018 | Airds Road and Huntsmore Road Intersection             | 13 – Right Rear                                        | nil        |
|      | Airds Road and Ben Lomond Road Roundabout Intersection | 30 – Rear End                                          | 2 x Injury |
| 2019 | Airds Road, North of Site                              | 71 – Left Off Carriageway into Object / Parked Vehicle | 1 x Injury |
|      | Airds Road, North of Site                              | 71 – Left Off Carriageway into Object / Parked Vehicle | 1 x Injury |
|      | Airds Road, North of Site                              | 32 – Right Rear                                        | nil        |
| 2020 | Airds Road and Huntsmore Road Intersection             | 10 – Cross Traffic                                     | 2 x Injury |

Source: RMS Crash Statistics Website

These crash statistics outline that there were no fatalities between 2016 and 2020.

### 1.5.3 Vulnerable Road Users

Vulnerable road users (VRU) are road users not in a car, bus or truck. In the event of a crash, VRUs have little to no protection from crash forces, therefore, need to be addressed within this CTMP. Provides context to VRUs surrounding the Site.

**TABLE 6: PUBLIC AND ACTIVE TRANSPORT**

| Road Name         | Pedestrian                    | Cycling                              | Public Transport           |
|-------------------|-------------------------------|--------------------------------------|----------------------------|
| Culverston Road   | No                            | No                                   | No                         |
| Airds Road        | Yes<br>Footpath Width = 2.4 m | Yes<br>Dedicated shared path         | Yes<br>Minto Train Station |
| Ben Lomond Road   | Yes<br>Footpath Width = 1.5 m | Yes<br>Bike-friendly road            | Yes<br>Minto Train Station |
| Pembroke Road     | No                            | Yes<br>Cyclist in the shoulders lane | Yes<br>Minto Train Station |
| Rose Payten Drive | Yes<br>Footpath Width = 2.4 m | Yes<br>Bike-friendly road            | No                         |
| Campbelltown Road | No                            | Yes<br>Bike-friendly road            | Yes<br>Minto Train Station |
| Hume Motorway     | No                            | Yes<br>Cyclist in the shoulders lane | No                         |

## 1.6 Stakeholder Engagement

### 1.6.1 Stakeholder Engagement Plan

Texco will liaise with relevant stakeholders regarding construction schedules and trucks routes and will raise any potential conflict with stakeholders at the earliest time.

### 1.6.2 Stakeholder Notification

In the event that any disruptions to roadways / footpath occur as a result of construction works, the procedure outlined below is to be followed:

- If any future disruptions to roadways / footpaths are required, Council / TfNSW is to be notified first and depending on the extent of the disruption the contractor is to notify affected property occupiers using letter drops and Variable Message Sign (VMS)
- If any unforeseen disruptions to roadways / footpaths occur, Council / TfNSW is to be notified first and depending on the extent of the disruption the contractor is to notify affected property occupiers via traffic controllers and Variable Message Sign (VMS)
- In the event that heavy vehicle damage to Council / TfNSW assets / infrastructure, contractors will notify Campbelltown Council's Traffic & Transport team and / or Assets Branch.

**TABLE 7: STAKEHOLDER CONSULTATION ACTIONS**

| Stakeholder                              | Action                                                                                                                |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>TfNSW</b>                             | Texco to submit CTMP to stakeholder.<br>Texco to liaise with stakeholder to address comments and re-submit final CTMP |
| <b>Campbelltown City Council</b>         | Texco to submit CTMP to stakeholder.<br>Texco to liaise with stakeholder to address comments and re-submit final CTMP |
| <b>Transport Management Centre (TMC)</b> | Texco to submit CTMP to stakeholder.<br>Texco to liaise with stakeholder to address comments and re-submit final CTMP |
| <b>NSW Police</b>                        | Texco to submit CTMP to stakeholder.<br>Texco to liaise with stakeholder to address comments and re-submit final CTMP |
| <b>Emergency Services</b>                | Texco to attend fortnightly meetings with TfNSW and Emergency Services                                                |

### 1.6.3 Stakeholder Consultation

Post SSD approval TfNSW and Campbelltown City Council was engaged with to consult regarding the construction traffic management recorded below:

**TABLE 8: POST APPROVAL CONSULTATION RECORD 01**

|                                     |                                        |
|-------------------------------------|----------------------------------------|
| <b>Identified Party to Consult:</b> | TfNSW, Campbelltown City Council (CCC) |
|-------------------------------------|----------------------------------------|



|                                                         |                                                                                                                                                                 |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Consultation type:</b>                               | Email<br>Phone Calls                                                                                                                                            |
| <b>When is consultation required?</b>                   | Prior to Construction Certification                                                                                                                             |
| <b>Why</b>                                              | Council is the local road authority and TfNSW is the state road authority – they are in charge of coordinating activities on the local and state road networks. |
| <b>When was consultation scheduled/held</b>             | 31 January 2022                                                                                                                                                 |
| <b>When was consultation held</b>                       | No response from Council nor TfNSW                                                                                                                              |
| <b>Identify persons and positions who were involved</b> | Frank Sirc (Campbelltown City Council)<br>Kevin Alawadhi (TfNSW)<br>Development Sydney Team (TfNSW)                                                             |
| <b>Provide the details of the consultation</b>          | Council and TfNSW was consulted with to request feedback following a review of the CTMP.                                                                        |
| <b>What specific matters were discussed?</b>            | <ul style="list-style-type: none"> <li>Feedback was requested on the CTMP as part of the consultation requirement from DPIE</li> </ul>                          |
| <b>What matters were resolved?</b>                      | <ul style="list-style-type: none"> <li>No responses were provided</li> </ul>                                                                                    |
| <b>What matters are unresolved?</b>                     | n/a                                                                                                                                                             |
| <b>Any remaining points of disagreement?</b>            | n/a                                                                                                                                                             |
| <b>How will Texco address matters not resolved?</b>     | n/a                                                                                                                                                             |

**TABLE 9: POST APPROVAL CONSULTATION RECORD 02**

|                                       |                                        |
|---------------------------------------|----------------------------------------|
| <b>Identified Party to Consult:</b>   | TfNSW, Campbelltown City Council (CCC) |
| <b>Consultation type:</b>             | Email<br>Phone Calls                   |
| <b>When is consultation required?</b> | Prior to Construction Certification    |

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Why</b>                                              | Council is the local road authority and TfNSW is the state road authority – they are in charge of coordinating activities on the local and state road networks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>When was consultation scheduled/held</b>             | 31 January 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>When was consultation held</b>                       | 15 <sup>th</sup> – 21 <sup>st</sup> February 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Identify persons and positions who were involved</b> | Frank Sirc, Team Leader Traffic Investigations (Campbelltown City Council)<br>Rana Haddad, Coordinator Central Business District (Campbelltown City Council)<br>Kevin Alawadhi, Road Safety Coordinator (TfNSW)<br>Sharon Verhaeven, Development Sydney Team (TfNSW)                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Provide the details of the consultation</b>          | Council and TfNSW was consulted with to request feedback following a review of the CTMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>What specific matters were discussed?</b>            | <ul style="list-style-type: none"> <li>Feedback was requested on the CTMP as part of the consultation requirement from DPIE</li> <li>Frank Sirc informed Ason that the CTMP consultation is a matter for the planning team and the CTMP and email was forwarded onto Rana (planning team) on 1<sup>st</sup> February 2022</li> <li>Rana (planning team) requested the CTMP and the associated SSD condition via phone on 15<sup>th</sup> February 2022 and it was provided to her on the same day.</li> <li>Sharon (Development Sydney Team, TfNSW) informed Ason following several emails that the CTMP has been forwarded to Shoba the planner.</li> </ul> |
| <b>What matters were resolved?</b>                      | <ul style="list-style-type: none"> <li>No responses were provided</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>What matters are unresolved?</b>                     | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Any remaining points of disagreement?</b>            | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>How will Texco address matters not resolved?</b>     | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**TABLE 10: POST APPROVAL CONSULTATION RECORD 03**

|                                     |                                        |
|-------------------------------------|----------------------------------------|
| <b>Identified Party to Consult:</b> | TfNSW, Campbelltown City Council (CCC) |
| <b>Consultation type:</b>           | Email<br>Phone Calls                   |

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>When is consultation required?</b>                   | Prior to Construction Certification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Why</b>                                              | Council is the local road authority and TfNSW is the state road authority – they are in charge of coordinating activities on the local and state road networks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>When was consultation scheduled/held</b>             | 31 January 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>When was consultation held</b>                       | 21 <sup>st</sup> February – 10 <sup>th</sup> March 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Identify persons and positions who were involved</b> | <p>Rana Haddad, Coordinator Central Business District (Campbelltown City Council)</p> <p>Shafiu Salam, Senior Development Engineer (Campbelltown City Council)</p> <p>Kevin Alawadhi, Road Safety Coordinator (TfNSW)</p> <p>Sharon Verhaeven, Development Sydney Team (TfNSW)</p> <p>Shoba Sivasubramaniam, Development Assessment Officer Greater Sydney (TfNSW)</p>                                                                                                                                                                                                                                                                                                                       |
| <b>Provide the details of the consultation</b>          | Council and TfNSW was consulted with to request feedback following a review of the CTMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>What specific matters were discussed?</b>            | <ul style="list-style-type: none"> <li>Feedback was requested on the CTMP as part of the consultation requirement from DPIE</li> <li>3<sup>rd</sup> March - Rana (Council planning team) informed Ason via phone that she has sent the CTMP for review to her manager and is awaiting to hear back.</li> <li>10<sup>th</sup> March - Shoba (TfNSW development assessment) has emailed Ason with a conditional endorsement of the CTMP.</li> <li>10<sup>th</sup> March – Rana (Council planning team) has emailed Ason comments from Council's senior development engineer regarding the CTMP requesting the inclusion of the images of the tickets of those who drafted the CTMP.</li> </ul> |
| <b>What matters were resolved?</b>                      | <ul style="list-style-type: none"> <li>TfNSW has endorsed the CTMP</li> <li>Council has no further comments on the CTMP following the inclusion of the images of the tickets of those who drafted the CTMP.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>What matters are unresolved?</b>                     | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Any remaining points of disagreement?</b>            | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>How will Texco address matters not resolved?</b>     | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## 2 Proposed Works and Staging

### 2.1 Overview of Works

The works proposed are to ensure the construction of the proposed warehouse development comprising of Stages 1 and 2 as shown in **Table 11**. It is estimated that the total duration of the construction works will be approximately 10 months from the commencement date.

**TABLE 11: STAGES 1 AND 2 SUMMARY**

| Criteria                                                         | Response                                                                                             |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Description of Key Activities                                    | General earthworks,<br>Construction of the temporary accesses, and<br>Enabling works                 |
| Max. Vehicle Size                                                | 20.0m Articulated Vehicles<br>(Special Permits may be required for floating in<br>plant)             |
| Vehicle Movement Frequency                                       | Approximately 6 light vehicle movements / day<br>+<br>Approximately 12 heavy vehicle movements / day |
| Truck Access Requirements                                        | All vehicles shall access via Compass Drive                                                          |
| Vehicle access / egress in a forward direction (Y / N)           | Y                                                                                                    |
| Out of Hours Deliveries (Y/N)                                    | Y – Upon written approval by the Planning<br>Secretary                                               |
| Contractor Parking                                               | Y – Onsite parking available for contractors                                                         |
| Pedestrian Control                                               | Wire mesh site boundary fencing. and Type A<br>hoarding                                              |
| Public Transport Services Affected                               | Nil                                                                                                  |
| Road Occupancy Requirements<br>(if yes, provide further details) | N                                                                                                    |
| Lane or Footpath Closures<br>(if yes, provide further details)   | N                                                                                                    |
| Traffic Control Plan                                             | Refer below.                                                                                         |

### 2.2 Construction Hours

Construction hours shall be in accordance with the Council guidelines and applicable SSD requirements:

**TABLE 12: HOURS OF WORK**

| Activity                    | Day             | Time         |
|-----------------------------|-----------------|--------------|
| Earthworks and construction | Monday – Friday | 7 am to 5 pm |
|                             | Saturday        | 8 am to 1 pm |

No work Sundays or Public Holidays.

It is anticipated that construction works will not be conducted outside of the hours outlined above. Should out of work hours be required, Texco will lodge an application for an Out of Work Hours Permit with Campbelltown City Council to seek approval for these works.

## 2.3 Truck Routes

It is proposed that all construction vehicles would enter and exit the Site via Culverston Road in a forward manner via the Site's access driveway shown in **Figure 4**. The routes shown are to be utilised by all construction vehicles travelling to and from the site and represents the shortest route available – hence minimising the impacts of the construction process. The roads detailed in the figure is derived from the TfNSW Restricted Access Vehicles (RAV) Map for 26m B-Double Access. As such, since the entire Minto precinct is designated for a GML 25m B-double truck, trucks would be able to enter and exit the Site using the TfNSW approved truck routes to drive onto Campbelltown Road and/or Hume Motorway to reach their required destination.

A copy of the approved routes will be distributed by the Contractor to all drivers before their arrival to Site.

No trucks are to be queued on local roads. Mobile phones, two-way radios or application-based solutions should be used to coordinate truck arrivals.





Figure 4: Construction Vehicle Route Map

As can be shown in **Figure 5**, the TfNSW Restricted Access Vehicles (RAV) Map shows that there is one road with Travel Conditions in close proximity to the site.





Figure 5: Restricted Access Map

## 2.4 Temporary Traffic Management Method

Traffic management shall be undertaken in accordance with the methodology outlined within the TGS, **Appendix C**. Traffic and non-vehicle related roads users are expected to be directed around the worksite in order to physically separate the road user from any hazards within the worksite.

## 2.5 Risk Assessment

A risk assessment is aimed to identify the hazards and risks associated with the works. The purpose of this risk assessment is to determine the controls required for the protection of the road workers and road users. A Risk assessment has been completed and is attached in **Appendix B**.

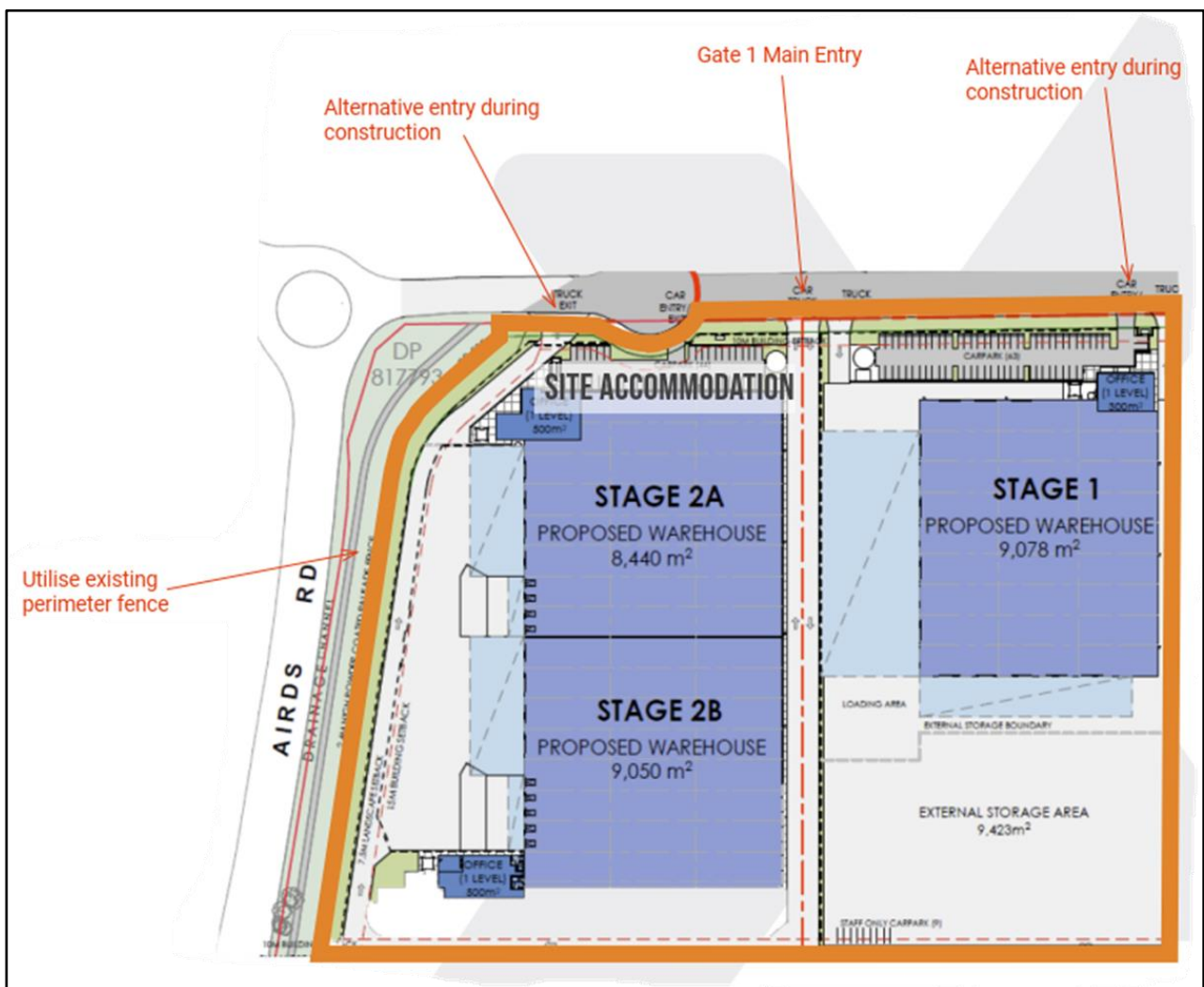
## 2.6 Site Contact

Refer to the Construction Environmental Plan (prepared by Texco) for further details.

## 2.7 Site Access

All access to the Site by construction personnel will be via Culverston Road through the Gate 1 Main Entry. Alternative entries during construction are shown in **Figure 6**.

Site accommodation is located toward the front of Stage 1 while inductions and toilets location are within site amenities. The existing perimeter fence will be utilised.





## 2.8 Works Zone

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A Work Zone is not required.

In the event that the implementation of any temporary traffic control measures on public road/road related area the contractor will obtain a Road Occupancy Permit (ROP) from the Campbelltown City Council. If excavation and/or road opening works on a public road is required, the contractor will obtain a Road Opening Permit.

## 3 Traffic Management

### 3.1 Vehicle Management

---

In accordance with TfNSW requirements, all vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during travel to and from the site. All drivers are to be familiar with the Driver Code of Conduct before attending the Site. A copy of the Code is included in **Appendix A**.

All subcontractors must be inducted by the lead contractor to ensure that the procedures are met for all vehicles entering and exiting the construction site. The lead contractors will monitor the roads leading to and from the site and take all necessary steps to rectify any road deposits caused by site vehicles.

Vehicle movements to, from and within the site shall do so in a manner, which does not create unreasonable or unnecessary noise or vibration. No tracked vehicles will be permitted or required on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances.

At no stage shall queueing occur on the public road network. It is expected that a schedule for deliveries of materials and goods will be established prior to that day, with Traffic Controllers maintain radio contact with construction vehicles at all times. This schedule shall be prepared by utilising construction traffic management software (such as Mooven or other similar products).

### 3.2 Contractor Parking

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Contractor shall be encouraged to use the available public transport where possible, noting that Minto Railway Station is 1.4km north from the Site.

For those contractors that do drive, onsite parking will be available. Suitable pedestrian connectivity shall be maintained between the work areas and this contractor parking at all times.

### 3.3 Pedestrian and Cyclist Management

---

A shared pedestrian and cyclist path is provided along the western and northern side of Airds Road. A footpath is provided on Rose Payten Drive and is also a bike-friendly road. Culverston Road does not have any footpaths, however, contractors will be using this road to access the Site.

In the unlikely event that there are pedestrians needing to cross an access driveway they will be halted by an accredited Traffic Controller while construction vehicles are entering or exiting the Site. Once the construction vehicles are clear, the Traffic Controller can allow pedestrians to continue along their journey.

### 3.4 Fencing Requirements

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The existing wire mesh site boundary fencing will be utilised along the entire boundary of the site and will be maintained for the duration of the construction program. The fencing is to ensure unauthorised persons are kept out of the Site.

### 3.5 Traffic Control

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A site-specific Traffic Guidance Scheme is provided in **Appendix C**. It should be noted that an accredited Traffic Controller shall be on-site to supervise construction vehicles passing general traffic.

### 3.6 Authorised Traffic Controller

---

There is a requirement for an authorised traffic controllers to be present throughout the bulk earthworks, and construction stages of the project. The responsibilities include:

- Implementation of the Traffic Control Plan.
- Pedestrian and cyclist management, to ensure that adverse conflicts between vehicle movements and pedestrians do not occur.
- Supervision of all vehicle movements across pedestrian footpaths at all times, and
- Supervision of all loading and unloading of construction materials during the deliveries in the construction phase of the project.

Refer to **Appendix C** for the Traffic Guidance Scheme for details of the proposed work zone, location of traffic controllers and associated traffic management measures.

### 3.7 Driver Code of Conduct

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All drivers shall adhere to the Driver Code of Conduct, outlined in **Appendix A**.

### 3.8 Worker Induction

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All workers and subcontractors engaged on-site would be required to complete a site induction. The induction should include permitted access routes to and from the construction site for all vehicles, as well as standard environmental, work, health and safety (WHS), driver protocols and emergency procedures.

Any workers required to undertake works or traffic control within the public domain would be suitably trained and covered by adequate and appropriate insurances.

## 4 Monitoring and Review

### 4.1 Monitoring Program

This CTMP shall be subject to ongoing review and will be updated accordingly. Regular reviews will be undertaken by the on-site coordinator. Review of the CTMP shall occur monthly. All and any reviews undertaken should be documented, however key considerations regarding the review of the CTMP shall be:

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

The development of a program to monitor the effectiveness of this CTMP shall be established by the Contractor. This process is expected to form part of the monitoring plan required to be included as part of the overarching Construction Environmental Management Plan (CEMP), of which this CTMP forms a part.

The roadway (including footpath) must be kept in a serviceable condition for the duration of construction. At the direction of Council, undertake remedial treatments such as patching at no cost to Council.

### 4.2 Work Site Inspections, Recording and Reporting

Recording and reporting of the monitoring programs shall be done in accordance with Section E.3, E.4 and E.5 of the TCAWs Manual. As such, the structure, schedule and frequency of these activities have been considered and identified.

To inspect, review and audit the temporary traffic management (TTM) arrangements implemented on site, the following actions are to be undertaken by suitably qualified personnel in accordance with TCAWS 6.0 requirements during all phases of construction, being:

**TABLE 13: EXAMPLE REVIEW OF ACTIVITIES**

| Activity           |                              |                             | Frequency or Details |
|--------------------|------------------------------|-----------------------------|----------------------|
| Shift Inspections  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                      |
| Weekly Inspections | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                      |
| TMP Review         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                      |
| Road Safety Audit  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                      |
| Other              | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                      |
| Comments           |                              |                             |                      |

Given that the length of construction and that no regular works have been proposed outside of the site, monthly TTM inspections is considered to be sufficient.

## 4.3 Contingency Plan

A contingency plan shall be established by the Contractor and is to be included in the overarching CEMP. Notwithstanding, **Table 14** outlines an indicative plan to be undertaken by the builder in the event that the monitoring program identifies the management plan is not effective in managing the construction impacts.

**TABLE 14: CONTINGENCY PLAN**

| Risk                   |          | Condition Green                                                                                          | Condition Amber                                                                                                                                                                                                                                                                      | Condition Red                                                                                                                                                                                                                                                                                                                                |
|------------------------|----------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction Movements | Trigger  | Construction traffic volume is in accordance with permissible and programmed volume and time constraints | Construction traffic volumes exceeds programmed volume but is within permissible volume constraints                                                                                                                                                                                  | Construction traffic volumes exceeds permissible volume and time constraints                                                                                                                                                                                                                                                                 |
|                        | Response | No response required                                                                                     | Review and investigate construction activities, and where appropriate, implement additional remediation measures such as: <ul style="list-style-type: none"> <li>Review CTMP and update where necessary</li> <li>Provide additional training.</li> </ul>                             | As with Condition Amber, plus; <ul style="list-style-type: none"> <li>If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies.</li> <li>Stop all transportation into and out of the site.</li> </ul>                                                  |
|                        | Trigger  | No construction vehicle movement during peak periods                                                     | Construction vehicle movement close to peak periods                                                                                                                                                                                                                                  | Construction vehicle movement during peak periods                                                                                                                                                                                                                                                                                            |
|                        | Response | No response required<br>Continue monitoring program                                                      | Review and investigate construction activities, and where appropriate, implement additional remediation measures such as: <ul style="list-style-type: none"> <li>Provide additional training (including toolbox talks and further notification of Driver Code of Conduct)</li> </ul> | As with Condition Amber, plus; <ul style="list-style-type: none"> <li>If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies.</li> <li>Stop all transportation into and out of the site.</li> <li>Review CTMP and update where necessary.</li> </ul> |
| Queuing                | Trigger  | No queuing identified                                                                                    | Queuing identified within site                                                                                                                                                                                                                                                       | Queuing identified on the public road                                                                                                                                                                                                                                                                                                        |

|                                |          |                                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|----------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | Response | No response required<br>Continue monitoring program  | Review the delivery schedule prepared by the builder. If drivers are not following the correct schedule, then they should be provided with additional training and an extra copy of the Driver Code of Conduct | As with Condition Amber, plus <ul style="list-style-type: none"> <li>Review and investigate construction activities.</li> <li>If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies.</li> <li>Temporary halting of activities and resuming when conditions have improved.</li> <li>Stop all transportation into and out of the site.</li> <li>Review CTMP and update where necessary, provide additional training.</li> </ul> |
| <b>Noise</b>                   | Trigger  | Noise levels do not exceed imposed noise constraints | Noise levels in minor excess of imposed noise constraints                                                                                                                                                      | Noise levels greatly in excess of imposed noise constraints                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                | Response | No response required                                 | Undertake all feasible and reasonable mitigation and management measures to minimise noise impacts.                                                                                                            | As with Condition Amber<br>If noise levels cannot be kept below applicable limits, then a different construction method or equipment must be utilised.                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Traffic Guidance Scheme</b> | Trigger  | No observable issues                                 | Minor inconsistencies with TGS to onsite operations                                                                                                                                                            | Near miss or incident occurring regardless of / as a result of the TGS being implemented                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | Response | No response required                                 | Traffic Controller to amend TGS on site and to keep a log of all changes                                                                                                                                       | Stop work until an investigation has been undertaken into the incident. There are to be changes made to the TGS to ensure that the safety of all workers, students and civilians are catered for.                                                                                                                                                                                                                                                                                                                      |
| <b>Dust</b>                    | Trigger  | No observable dust                                   | Minor quantities of dust in the air and tracking on to the road                                                                                                                                                | Large quantities of dust in the air and tracking on to the road                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                | Response | No response required                                 | Review and investigate construction activities and respective control measures, where                                                                                                                          | As with Condition Amber. <ul style="list-style-type: none"> <li>If it is concluded that construction</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                        |

|  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                       |
|--|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  | <p>appropriate. Implement additional remedial measures, such as:</p> <ul style="list-style-type: none"> <li>• Deployment of additional water sprays</li> <li>• Relocation or modification of dust-generating sources</li> <li>• Check condition of vibrating grids to ensure they are functioning correctly.</li> <li>• Temporary halting of activities and resuming when conditions have improved</li> </ul> | <p>activities were directly responsible for the exceedance, submit an incident report to government agencies.</p> <ul style="list-style-type: none"> <li>• Implement relevant responses and undertake immediate review to avoid such occurrence in future.</li> </ul> |
|--|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



# Appendix A. Driver Code of Conduct

## Drivers Code of Conduct

Safe Driving Policy for 5-9 Culverston Road, Minto.

### Objectives of the Drivers Code of conduct

- To minimise the impact of earthworks on the local and regional road network;
- To minimise conflict with other road users;
- To minimise road traffic noise; and
- To ensure truck drivers use specified heavy vehicles routes between the Site and the sub-regional road network.

### Code of Conduct

All vehicle operators accessing the site must:

- Take reasonable care for his or her own personal health and safety;
- Not adversely, by way of actions or otherwise, impact on the health and safety of other persons;
- Notify their employer if they are not fit for duty prior to commencing their shift;
- Obey all applicable road rules and laws at all times;
- In the event an emergency vehicle behind your vehicle, pull over and allow the emergency vehicle to pass immediately;
- Obey the applicable driving hours in accordance with legislation and take all reasonable steps to manage their fatigue and not drive with high levels of drowsiness;
- Obey all on-site signposted speed limits and comply with directions of traffic control supervisors in relation to movements in and around temporary or fixed work areas;
- Ensure all loads are safely contained / restrained, as necessary;
- Drive over devices – located at the site's access – to vibrate off and wash off any loose material attached to heavy vehicles;
- Operate their vehicles in a safe and professional manner, with consideration for all other road users;
- Hold a current Australian State or Territory issued driver's licence;
- Notify their employer or operator immediately should the status or conditions of their driver's license change in any way;
- Comply with other applicable workplace policies, including a zero tolerance of driving while under the influence of alcohol and/or illicit drugs;

- Not use mobile phones when driving a vehicle or operating equipment. If the use of a mobile device is required, the driver shall pull over in a safe and legal location prior to the use of any mobile device;
- Advise management of any situations of which you know, or think, may present a threat to workplace health and safety;
- Drive according to prevailing conditions (such as during inclement weather) and reduce speed, if necessary; and
- Have necessary identification documentation at hand and ready to present to security staff on entry and departure from the Site, as necessary, to avoid unnecessary delays to other vehicles.

## Crash or incident Procedure

- Stop your vehicle as close to it as possible to the scene, making sure you are not hindering traffic. Ensure your own safety first, then help any injured people and seek assistance immediately if required.
- Ensure the following information is noted:
  - Details of the other vehicles and registration numbers;
  - Names and addresses of the other vehicle drivers;
  - Names and addresses of witnesses; and
  - Insurers details.
- Give the following information to the involved parties:
  - Name;
  - Address; and
  - Company details
- If the damaged vehicle is not occupied, provide a note with your contact details for the owner to contact the company.
- Ensure that the police are contacted should the following circumstances occur:
  - If there is a disagreement over the cause of the crash;
  - If there are injuries; and / or
  - If you damage property other than your own.
- As soon as reasonably practical, report all incident details to your manager.

# Appendix B. Risk Assessment

# Proposed Warehouse Development – 5-9 Culverston Road, Minto

## Risk Assessment and Communication Tool

|                         |                                |           |            |
|-------------------------|--------------------------------|-----------|------------|
| Project Number          | 1950                           |           |            |
| Project Name            | Proposed Warehouse Development |           |            |
| Site Location           | 5-9 Culverston Road, Minto     |           |            |
| Date of Assessment      | 12 <sup>th</sup> January 2022  |           |            |
| Revision                | Issue I                        |           |            |
|                         |                                |           |            |
| Name                    | Company                        | Title     |            |
|                         |                                |           |            |
|                         |                                |           |            |
|                         |                                |           |            |
|                         |                                |           |            |
|                         |                                |           |            |
|                         |                                |           |            |
| <b>Document Control</b> |                                |           |            |
| Date Issued             | Revision                       | Issued By | Checked By |
| 12/01/2022              | Draft                          | W. Zheng  |            |
|                         |                                |           |            |

| Risk Matrix    |   | Consequence |        |        |          |              |
|----------------|---|-------------|--------|--------|----------|--------------|
|                |   | Minor       | Major  | Severe | Critical | Catastrophic |
|                |   | A           | B      | C      | D        | E            |
| Very Unlikely  | 1 | Low         | Low    | Medium | Medium   | Medium       |
| Unlikely       | 2 | Low         | Low    | Medium | Medium   | High         |
| Possible       | 3 | Low         | Medium | High   | High     | High         |
| Likely         | 4 | Medium      | Medium | High   | High     | Extreme      |
| Almost Certain | 5 | Medium      | High   | High   | Extreme  | Extreme      |

| Description      |                                                                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A - Minor        | Could result in injury or illness not resulting in a lost work day or minimal environmental damage not required to be notified under jurisdiction requirements.            |
| B - Major        | Could result in injury or illness resulting in one or more lost work day(s) or environmental damage can be mitigated and is not required to be notified under jurisdiction |
| C - Severe       | requirements where restoration activities can be accomplished.                                                                                                             |
| D - Critical     | Could result in permanent partial disability, injuries or illness that may result in                                                                                       |
| E - Catastrophic | hospitalisation of persons or environmental damage can be mitigated and is required to be notified under jurisdiction requirements.                                        |

| Likelihood Descriptor | Design Likelihood                                                                              |
|-----------------------|------------------------------------------------------------------------------------------------|
| 1 - Very unlikely     | Industry experience suggests design failure is very unlikely. It can be assumed failure        |
| 2 - Unlikely          | Industry experience suggests design failure is unlikely to occur in the life of design.        |
| 3 - Possible          | Industry experience suggests design failure is possible some time during the life of the       |
| 4 - Likely            | Industry experience suggests design failure is likely to occur during the life of the product. |
| 5 - Almost certain    | Industry experience suggests design failure is almost certain to occur during the life of the  |

## Risk Assessment and Communication Tool

### Example

| ID. Ref | Risk and/ or Hazard                          | Risk Description                                                      | Location                   | Existing Control | Initial Risk Rating |   |        | Design Response to risk and /or hazard                                                                                                                                                                                     | Status of Risk  | Assignment of risk or hazard | Residual risk rating |   |     |
|---------|----------------------------------------------|-----------------------------------------------------------------------|----------------------------|------------------|---------------------|---|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------|----------------------|---|-----|
|         |                                              |                                                                       |                            |                  | C                   | L | RR     |                                                                                                                                                                                                                            |                 |                              | C                    | L | RR  |
| 1       | Unauthorized Access to the Site              | Site prevents unauthorised access                                     | Entire Site                | Nil              | C                   | 3 | High   | Boundary fence will be provided as part of the main works. The design provides a defined separation between public areas and work area. Admin area is located in front of the site to minimise unauthorised visitor access | Design Solution | Main Contractor              | B                    | 2 | Low |
| 2       | Interaction between pedestrians and vehicles | Vehicles and pedestrians to be separates as best possible             | Entire Site & Access Roads | Nil              | D                   | 3 | High   | Dedicated footpath, pedestrian crossings and additional signage shall be provided to separate vehicles and pedestrians as best possible.                                                                                   | Design Solution | Main Contractor              | B                    | 2 | Low |
| 3       | Potential vehicle conflict points            | Vehicles can crash with each other while manoeuvring through the site | Entire Site & Access Roads | Nil              | B                   | 3 | Medium | One-way manoeuvring around the site limits any interaction for oncoming vehicles to the access only, coupled with low speeds throughout the site.                                                                          | Design Solution | Main Contractor              | B                    | 1 | Low |

|   |                                            |                                                                           |             |     |   |   |      |                                                                                                                                                                                                                                               |                 |                 |   |   |        |
|---|--------------------------------------------|---------------------------------------------------------------------------|-------------|-----|---|---|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|---|---|--------|
| 4 | Fatigue                                    | Injury caused by fatigue                                                  | Entire Site | Nil | C | 3 | High | Toolbox meetings and regular breaks (in line with WHS practices) to minimise fatigue                                                                                                                                                          | Design Solution | Main Contractor | B | 1 | Low    |
| 5 | Fall risks                                 | Injury due to falls (in general)                                          | Entire Site | Nil | E | 3 | High | Ensuring level changes across the site to be minimised as best possible, with additional black & yellow hazard tape/markings being installed where appropriate. Installation of handrails where level changes / ramps grades are significant. | Design Solution | Main Contractor | C | 2 | Medium |
| 6 | Misdirected access in to neighbouring site | Vehicle in unsafe locations                                               | Entire Site | Nil | C | 3 | High | Ensuring appropriate directional signage has been provided to ensure vehicles do not access the wrong construction site, which could create potential safety breaches and hazards for all parties                                             | Design Solution | Main Contractor | B | 2 | Low    |
| 7 | Conflicting Traffic Management             | Coordinating Traffic Controllers could create misleading and wrong advice | Entire Site | Nil | C | 3 | High | Toolbox meetings, regular liaison with all construction teams and review of signage plans on site in order to minimise contradicting signage.                                                                                                 | Design Solution | Main Contractor | C | 2 | Medium |



# Appendix C. Traffic Guidance Scheme

# TGS GENERAL NOTES

- ALL PUBLIC ROADS WILL HAVE A SPEED LIMIT OF 50KM/H UNLESS IDENTIFIED OTHERWISE
- NOT ALL DIMENSIONS SHOWN ARE TO SCALE
- LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY
- ALL SIGNS ARE TO BE MINIMUM SIZE A
- ALL SIGNS ARE TO BE CLASS 1 RETROREFLECTIVE
- ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH TFSNWS TRAFFIC CONTROL AT WORK SITES TECHNICAL MANUAL ISSUE 6 (RELEASED 2020) AND AUSTRALIAN STANDARDS AS1742.3:2019 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS
- THIS TRAFFIC CONTROL PLAN MUST BE SET UP BY A PERSON HOLDING AN "IMPLEMENT TRAFFIC MANAGEMENT PLAN" TICKET AND TFSNWS TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION
- THE ACCREDITED PERSONNEL SHALL IMPLEMENT THE APPROVED TOP BEFORE ANY PHYSICAL WORK COMMENCES AND ENSURE A COPY OF THE TOP IS KEPT ON-SITE. THE ACCREDITED PERSONNEL SHALL ALSO DRIVE THROUGH THE SITE BEFORE WORKS BEGIN TO ENSURE THAT THE TOP HAS BEEN IMPLEMENTED CORRECTLY AND THAT THE IT WILL WARN, INSTRUCT AND GUIDE ROAD USERS AS DESIGNED. ANY VARIATIONS TO THE PLAN MUST BE MARKED ON THE PLAN AND INITIALED BY THE ACCREDITED PERSONNEL
- IT IS THE RESPONSIBILITY OF THE ACCREDITED PERSONNEL WITH A "PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN" TO ENSURE THE FOLLOWING:
  - \* THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURE THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
  - \* VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES
  - \* AT ALL TIMES AN UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHALL BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE
- ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN
- IF IT IS THE WORKSITE IS LEFT UNATTENDED THE CONTRACTOR'S DUTY TO ENSURE THAT THE APPROPRIATE PERSON ARE TAKEN TO PROVIDE A SAFE ENVIRONMENT FOR VEHICLES AND PEDESTRIANS TO RELEVANT AUSTRALIAN STANDARDS
- TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS ARE TO BE COVERED OR REMOVED WHEN TRAFFIC CONTROLLERS ARE NOT ON SITE
- ALL SIGNAGE IS TO BE CLEAN, CLEARLY VISIBLE AND NOT OBSCURED
- ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2019
- ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH SECTION 2.5.2 OF AS1742.3:2019. HOWEVER, MODIFICATIONS CAN BE MADE TO SUIT SITE CONDITIONS
- IF REQUIRED, A TGS MUST BE SELECTED, DEVELOPED AND IMPLEMENTED BY A SUITABILITY QUALIFIED PERSON (PW2IMP AND ITOP QUALIFICATIONS)

|                                                                                     |                                               |
|-------------------------------------------------------------------------------------|-----------------------------------------------|
|  | WORK AREA                                     |
|  | SIGN AND POST                                 |
|  | CONSTRUCTION FENCING                          |
|  | SITE OFFICE AND AMENITIES                     |
|  | SITE VEHICLE GATE                             |
|  | SITE VEHICLE GATE (ALTERNATIVE WHEN REQUIRED) |

## EXISTING SITE FENCING TO BE USED ON THE AIRDS ROAD FRONTAGE

REFER TO LANDSCAPE ARCHITECT'S DRAWINGS FOR PLANTING DETAIL

| AMENDMENTS |          |                            |  |     |     |     |
|------------|----------|----------------------------|--|-----|-----|-----|
|            |          |                            |  |     |     |     |
|            |          |                            |  |     |     |     |
|            |          |                            |  |     |     |     |
|            |          |                            |  |     |     |     |
|            |          |                            |  |     |     |     |
| 02         | 17.02.22 | TGS FOR CONSTRUCTION ISSUE |  | WZ  | XX  | WZ  |
| 01         | 20.01.22 | TGS                        |  | WZ  | XX  | XX  |
| REV        | DATE     | DESCRIPTION                |  | DRW | CHK | APP |

This drawing is provided for information purposes only and should not be used for construction.

Base Plan prepared by Charter Hall, received 17.01.21.

Culverston Road has a posted speed limit of 50km/hr.

Swept path assessments completed at 10 km/h and 300mm clearance.

|                         |                    |
|-------------------------|--------------------|
| DESIGNED<br>Wendy Zheng | PAPER SIZE<br>A1   |
| CHECKED BY<br>X.XXXX    | DATE<br>21.01.2022 |
| APPROVED BY<br>W. ZHENG | SCALE<br>1:800     |

CLIENT

TEXCO

---

PROJECT

1950

5-9 CULVERSTON ROAD MINTO

TRAFFIC GUIDANCE SCHEME

STAGES 01 AND 02 CONSTRUCTION

---

DRAWING STATUS

FOR CONSTRUCTION

Suite 17.02, Level 17, 1 Castlereagh St  
Sydney NSW 2000  
info@asongroup.com.au

|                   |       |
|-------------------|-------|
| FILE NAME         | SHEET |
| AG1950-01-v02.dwg | AG01  |

# Appendix D. CVs

Dora has 20 years of professional experience across the fields of urban planning, and traffic and transport engineering. With specialities in concept and schematic traffic design, road safety engineering, construction traffic management planning and major event traffic and transport operations planning, Dora focus on achieving practical, customer centred solutions commensurate with the project type, purpose and level of user experience established in collaboration with clients, delivery partners and project teams.

Dora's expertise in land use development planning and design has specific focus on car park design, traffic

management system design, and loading facilities design and design of traffic systems based on the operational requirements as well as future adaptability of spaces. Dora has been involved in a broad range of traffic and transport projects providing high quality service and end to end project advice to a range of public and private sector clients.

Dora has worked on a broad range of inter-disciplinary design teams where she collaborated with clients and consultants of various disciplines in achieving forward thinking outcomes that considers both current and future needs of end users.

## QUALIFICATIONS & EDUCATION

- Post Graduate Diploma in Transport and Traffic (Monash)
- Post Graduate Diploma Planning & Design (Melbourne)
- Bachelor of Science (Auckland)

- Current Ason Group (Principal Lead: Traffic Management & Operations)
- 2018 – 2020 GTA Consultants (Associate Director)
- 2008 – 2018 Ratio Consultants (Senior Associate)
- 2013 – 2014 G20 Taskforce, Department of the Prime Minister and Cabinet (Assistant Director – Transport)
- 2007 – 2008 City of Melbourne (Senior Traffic Engineer)
- 2006 – 2007 City of Port Phillip (Transport Engineering Officer)
- 2005 – 2006 City of Port Phillip (Melbourne 2006 Commonwealth Games Operations Planner)
- 2000 – 2005 City of Port Phillip (Various Roles)

## PROFESSIONAL BACKGROUND

### KEY SKILLS

- Transport Management and Operations Planning
- Transport Design
- Event Traffic and Transport Management Operations Planning and Delivery
- Stakeholder management

### KEY PROJECTS

#### Warrick Lane Precinct, Blacktown NSW Blacktown City Council

The Warrick Lane Precinct (The Precinct) is located within the Blacktown City Centre, 500 metres east of Blacktown

Railway Station. The 2.8-hectare site has been identified for redevelopment as part of the of the Blacktown City Centre Transformation. The objective of the transformation is to provide employment, housing, social, cultural,



Principal Lead – Traffic Management & Operations

Email: [dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)

Phone: 0450 923 889

recreation and transport infrastructure within a framework of sustainability and design excellence.

Dora was engaged by Blacktown City Council to provide traffic and transport advice on the transformation project, and managed the delivery of a range of transport engineering output including schematic and detailed design input to the Project, Transport Impact Assessment in multiple phases, DA stage and Detailed Stage Construction Traffic and Pedestrian Management Plan preparation and worked closely with the broader project team.

### **Blacktown Health Precinct, Blacktown NSW Blacktown City Council**

Blacktown Health Precinct is located to the east of the Blacktown City Centre. The Health Precinct has been identified as a transformation project of the Blacktown City Council to support the forecasted growth in population planned for Blacktown. The objective of the transformation is to provide employment and social infrastructure within a framework of sustainability and design excellence.

Dora was engaged by Blacktown City Council to provide traffic and transport advice on the transformation project, and managed the delivery of a range of transport engineering output including masterplan, strategic transport analytics and design input to the Project.

### **Woolworths National Loading Facilities Transport Management Safety Review | Woolworths**

Dora was the National Technical Leader for the development and delivery of a loading facilities transport management safety review program for the Supermarkets branch of Woolworths which involved the development and delivery of a transport management inspection, review and reporting program involving over 1000 stores. Dora worked closely with the Health and Safety section of Woolworths and was a key member of the delivery team of the study.

### **Woolworths Drive Program Design Standards Development and Test Fit | Woolworths**

Dora was the National Technical Design Lead for the review and provision of technical design advice to inform the development of standard layout and the design guideline of drive through facilities for Woolworth Supermarket assets.

Dora has completed a series of test fits across a number of stores located in NSW, SA, WA and NT reviewing and providing design options to retrofit drive through facilities.

### **Woolworths Minchinbury Distribution Centre (NSW) | Woolworths**

Dora was the Project Director and Transport Engineering Lead for the redesign of loading, circulation and parking facilities within the existing Woolworths Minchinbury Distribution Centre and associated Development Application Transport Assessment and Modification application.

### **Woolworths Fresh Refrigerated Distribution Centre (VIC) | Fabcot**

Dora was the Transport Engineering Lead from feasibility phase of the project, to completion of Planning Permit application and associated Concept to Schematic Design phases of the Woolworths Fresh Project in Truganina, Victoria. The project involved the development of a fourth leg to a roundabout, B-Double queuing areas, vehicle circulation, as well as parking facilities and design of a channelised right turn facility along Foundation Road.

### **Woolworths Melbourne South Regional Distribution Centre (VIC) | Fabcot**

Dora was the Transport Engineering Lead for the project and has provided transport engineering input from the development of the Principal's Project Requirement, assisting the Project Architect in the development of a reference design, assistance in provision of transport engineering advice to inform site selection, subsequent Concept and Schematic Design work, and Transport Impact Assessment for the Planning Application.

### **Victoria Police Centre (2016 – 2020) and City West Police Complex (2011 – 2015), Melbourne | Cbus Property**

The recently completed Victoria Police Centre and the City West Police Complex located at the corner of Spencer Street and La Trobe Street, Melbourne forms a custom-designed, integrated precinct.

Dora was the Transport Engineering Lead for the project since 2011 and has worked collaboratively with both the Project Principal, representatives of Victoria Police and the Project Design Team to develop custom designed solutions

Principal Lead – Traffic Management & Operations

Email: [dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)

Phone: 0450 923 889

to traffic and transport facilities associated with the development. Dora prepared Transport Assessment reports, technical memorandums, and heavily involved in consultation with authorities and stakeholder consultation.

#### **Secure Facilities, Melbourne | Reserve Bank of Australia**

Dora was the Traffic Management Lead for the Secure Facilities developed by the Reserve Bank of Australia in Craigieburn, Melbourne.

Dora was engaged to develop traffic management arrangements, functional requirements and specifications embedded into the architectural, civil and security arrangements of the project.

#### **Other Select Projects:**

##### ***Education***

#### **Alex Avenue Public School | NSW Department of Education**

Dora was the Transport Engineering Lead for the project, and assisted in the preparation of contingency parking and site access design, responses to Response to Submissions, development of School Transport Plan, and liaison with Council.

#### **Estella Public School | NSW Department of Education**

Dora was the Transport Engineering Lead for the project, and assisted in the preparation of responses to Response to Submissions, development of site access design, School Transport Plan, and liaison with key stakeholders.

#### **Barramurra Public School | NSW Department of Education**

Dora was the Transport Engineering Lead for the project, and assisted in the preparation of responses to Response to Submissions, development of site access design, School Transport Plan, and liaison with key stakeholders.

#### **Hastings Secondary College (Port Macquarie Campus) | NSW Department of Education**

Dora was the Transport Engineering Lead for the project, and assisted in the preparation of contingency parking and site access design, responses to Response to Submissions,

development of Preliminary School Transport Plan, and liaison with Council.

#### **Murrumbateman Public School | NSW Department of Education**

Dora is the Transport Engineering Lead for the project, and assisted in the preparation of responses to Response to Submissions, development of site access design, School Transport Plan, and liaison with key stakeholders.

#### **Googong Public School | NSW Department of Education**

Dora is the Transport Engineering Lead for the project, and assisted in the preparation of responses to Response to Submissions, development of site access design, School Transport Plan, and liaison with key stakeholders.

#### **North Sydney Public School | NSW Department of Education**

Dora is the Transport Engineering Lead for the project, and assisted in the preparation of contingency parking and site access design, responses to Response to Submissions, development of School Transport Plan, and liaison with Council.

##### ***Mixed Use***

#### **Langston Place, Epping (NSW) | Cbus Property**

#### **88 Walker Street, North Sydney | Billbergia**

#### **1 Dension Street, North Sydney | Multiplex and The Winten Property Group**

#### **435 Collins Street, Melbourne (VIC) | Cbus Property**

#### **140 – 150 Queen Street, Melbourne (VIC) | Cbus Property**

##### ***Community***

#### **Tom Wills Community Oval | Sydney Olympic Park Authority**

Wendy is a qualified civil engineer with eight years of work experience across project management, traffic engineering, construction management, and civil and drainage design

During this time, Wendy has been involved in numerous projects for both private organisations and government agencies in Australia and United Kingdom.

Wendy has demonstrated her ability across numerous areas of traffic engineering, transport construction, and civil design and has been involved in many significant projects.

Past projects have ranged in size from detailed design of intersection upgrades to the preparation of Construction Traffic Management Plans, Traffic Control Plans, and Construction and Occupation Certification for both private

and public clients. Wendy also has experience dealing with the Transport Management Centre to obtain Road Occupancy Licenses as well as negotiating with Sydney Coordination Office for CTMP approvals.

While working in the UK Wendy was involved in the management, design and delivery of several large scale projects for local councils such as the School Streets project for Haringey and Liveable Streets programme in Tower Hamlets.

Wendy has worked on a broad range of inter-disciplinary design teams where she collaborated with clients and consultants of various disciplines in achieving forward thinking outcomes that considers both current and future needs of end users.

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## QUALIFICATIONS & EDUCATION

- Master of Engineering Management (University of Technology Sydney)
- BE Civil Engineering w Architecture (University of New South Wales)
- RMS Prepare a Work Zone Traffic Management Plan Card (Combined orange and red card)
- WorkCover Occupational Health and Safety Construction Induction Card.
- Member of Engineers Australia

---

## PROFESSIONAL BACKGROUND

- 2020 – Current: Ason Group  
Senior Traffic Design Engineer
- 2019 – 2020: Project Centre Limited (UK)  
Senior Traffic Engineer
- 2019 – 2019: WSP (UK)  
Senior Engineer
- 2016 – 2019: GTA Sydney  
Consultant and Senior Consultant
- 2012 – 2016: The Hills Shire Council  
Graduate, and Civil Design Engineer

---

## KEY SKILLS

- Transport Management and Operations Planning
- Transport Design
- Civil and Drainage Design
- Stakeholder management
- Autocad suite / Microstation
- Vehicle tracking / Autoturn

---

## KEY PROJECTS & EXPERIENCE

### 388 George Street, Sydney | Multiplex

Wendy was the Project Manager and Traffic Management Lead for the Construction Traffic Management Planning for the development, as well as the internal traffic management works with the adjoining building that include coordination with Sydney Light Rail Works and construction activities of other nearby developments.

### David Jones Elizabeth Street, Sydney | Mainbrace

Wendy was the Project Manager and Traffic Management Lead for the Construction Traffic Management Planning for

the development in obtaining the first approval for nighttime concrete works in the CBD from SCO and overtime ROLs while liaising with adjoining developments and Sydney Metro.

### Langston Place, Epping | Hutchison Builders

Wendy was the Project Manager and Traffic Management Lead for the Construction Traffic Management Planning for the development in obtaining the first approval for construction works during Epping to Chatswood rail replacement period from the expanded SCO.

# Appendix E. Council Consultation Record



## Wendy Zheng

---

**From:** Wendy Zheng  
**Sent:** Monday, 31 January 2022 3:08 PM  
**To:** frank.sirc@campbelltown.nsw.gov.au  
**Cc:** Dora Choi  
**Subject:** 5-9 Culverston Rd, Minto  
**Attachments:** P1950r01v2 CTMP\_5-9 Culverston Road, Minto.pdf

Hi Frank

Please see attached for the CTMP for the Stages 1 and 2 construction at 5-9 Culverston Road, Minto.

Please let us know if you have any feedback and whether anything needs to be updated before we submit to DPIE.

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

## Wendy Zheng

---

**From:** Frank Sirc <frank.sirc@campbelltown.nsw.gov.au>  
**Sent:** Tuesday, 15 February 2022 10:02 AM  
**To:** Wendy Zheng  
**Cc:** Dora Choi; Rana Haddad  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

I tried calling Rana but a message goes to her phone. I believe she is very busy.

I sent your previous email to her on 1 February. You may wish to send an email directly to her.

Regards frank

---

**From:** Wendy Zheng <wendy.zheng@asongroup.com.au>  
**Sent:** Tuesday, 15 February 2022 9:57 AM  
**To:** Frank Sirc <frank.sirc@campbelltown.nsw.gov.au>  
**Cc:** Dora Choi <dora.choi@asongroup.com.au>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Frank

Thank you for letting me know.

Is there a way for me to contact Ms Rana Haddad directly?

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>  
**Sent:** Tuesday, 15 February 2022 9:56 AM  
**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

I had previously sent the CTMP to one of the Planning Coordinators, Ms Rana Haddad in City Development to have someone call you.

I am not familiar with this Development so I asked City Development to get in contact. I have forwarded this email to Ms Rana Haddad.

Regards frank

**Frank Sirc**  
Team Leader Traffic Investigations



M: [0428 568 416](tel:0428568416)  
E: [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
W: [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)



Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.



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---

**From:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Sent:** Friday, 11 February 2022 9:45 AM  
**To:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Frank

How are you going?

We appreciate it is a busy period but would be you be able to let us know when we be able to get some feedback on this CTMP?

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

T: +61 2 9083 6601 | M: +61 401 969 768 | E: [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
A: Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Monday, 31 January 2022 3:08 PM  
**To:** [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** 5-9 Culverston Rd, Minto

Hi Frank

Please see attached for the CTMP for the Stages 1 and 2 construction at 5-9 Culverston Road, Minto.

Please let us know if you have any feedback and whether anything needs to be updated before we submit to DPIE.

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

T: +61 2 9083 6601 | M: +61 401 969 768 | E: [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
A: Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

**Frank Sirc**  
Team Leader Traffic Investigations



M: [0428 568 416](tel:0428568416)  
E: [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
W: [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)



Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.



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**Frank Sirc**  
Team Leader Traffic Investigations



M: [0428 568 416](tel:0428568416)  
E: [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
W: [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)



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## Wendy Zheng

---

**From:** Rana Haddad <Rana.Haddad@campbelltown.nsw.gov.au>  
**Sent:** Monday, 21 February 2022 9:26 AM  
**To:** Wendy Zheng  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

We are having a meeting with the engineers sometime this week to address this matter and respond to you as quickly as possible.

Kind regards  
Rana Haddad

---

**From:** Wendy Zheng <wendy.zheng@asongroup.com.au>  
**Sent:** Monday, 21 February 2022 9:07 AM  
**To:** Rana Haddad <Rana.Haddad@campbelltown.nsw.gov.au>  
**Cc:** Dora Choi <dora.choi@asongroup.com.au>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana

I do apologise for the emails but we do need to present to DPIE when the result of consultation with Council can be received – when would we be able to get feedback on this CTMP?

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Thursday, 17 February 2022 10:24 AM  
**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana

I appreciate that your traffic engineer has not started yet but can we get some idea of the timeline for the feedback on this CTMP?

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Tuesday, 15 February 2022 12:08 PM  
**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana

Thank you for calling me, apologies the SSD number is 7500, see below for the specific condition:

## TRAFFIC AND ACCESS

### Construction Traffic Management Plan

- B1. Prior to the commencement of construction, the Applicant must prepare Plan (CTMP) for the Development to describe the management of traffic during construction. The CTMP shall form part of the CEMP required by Condition 10 of the Development Consent Order.
- (a) be prepared by a suitably qualified and experienced person(s), in accordance with the requirements of the CEMP;
  - (b) be submitted to the satisfaction of the Secretary prior to the commencement of construction;
  - (c) detail the measures that would be implemented to ensure road safety during earthworks and construction;
  - (d) detail heavy vehicle routes, access and parking arrangements;
  - (e) include a Driver Code of Conduct to:
    - (i) minimise the impacts of earthworks and construction on the local community;
    - (ii) minimise conflicts with other road users;
    - (iii) minimise road traffic noise; and
    - (iv) ensure truck drivers use specified routes;
  - (f) include a program to monitor the effectiveness of these measures;
  - (g) if necessary, detail procedures for notifying residents and the community of any potential disruptions to routes.

The full SSD is also attached as well as the CTMP for consultation.

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Tuesday, 15 February 2022 10:29 AM  
**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>

**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana

Frank has referred the 5-9 Culverston Rd, Minto CTMP to your department at the beginning of the month.

We appreciate it is a busy period but would be greatly appreciated if you are able to let us know when we be able to get some feedback on this CTMP?

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

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**From:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>

**Sent:** Tuesday, 15 February 2022 10:02 AM

**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>

**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>; Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

I tried calling Rana but a message goes to her phone. I believe she is very busy.

I sent your previous email to her on 1 February. You may wish to send an email directly to her.

Regards frank

---

**From:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>

**Sent:** Tuesday, 15 February 2022 9:57 AM

**To:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>

**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Frank

Thank you for letting me know.

Is there a way for me to contact Ms Rana Haddad directly?

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000



---

**From:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>  
**Sent:** Tuesday, 15 February 2022 9:56 AM  
**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

I had previously sent the CTMP to one of the Planning Coordinators, Ms Rana Haddad in City Development to have someone call you.

I am not familiar with this Development so I asked City Development to get in contact. I have forwarded this email to Ms Rana Haddad.

Regards frank

**Frank Sirc**  
Team Leader Traffic Investigations



M: [0428 568 416](tel:0428568416)  
E: [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
W: [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)



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---

**From:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Sent:** Friday, 11 February 2022 9:45 AM  
**To:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Frank

How are you going?

We appreciate it is a busy period but would be you be able to let us know when we be able to get some feedback on this CTMP?

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

T: +61 2 9083 6601 | M: +61 401 969 768 | E: [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
A: Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Monday, 31 January 2022 3:08 PM  
**To:** [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** 5-9 Culverston Rd, Minto

Hi Frank

Please see attached for the CTMP for the Stages 1 and 2 construction at 5-9 Culverston Road, Minto.

Please let us know if you have any feedback and whether anything needs to be updated before we submit to DPIE.

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

**Frank Sirc**  
Team Leader Traffic Investigations



**M:** [0428 568 416](tel:0428568416)  
**E:** [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
**W:** [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)



Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.



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**Frank Sirc**  
Team Leader Traffic Investigations



**M:** [0428 568 416](tel:0428568416)  
**E:** [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
**W:** [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)



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## Wendy Zheng

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**From:** Wendy Zheng  
**Sent:** Thursday, 10 March 2022 3:19 PM  
**To:** Shafiul Salam; Rana Haddad; Thomas Bertwistle  
**Cc:** David Smith; Justin Crameri; Dora Choi  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Shafi

Thank you we will update for the photos and re-issue.

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Shafiul Salam <Shafiul.Salam@campbelltown.nsw.gov.au>  
**Sent:** Thursday, 10 March 2022 3:14 PM  
**To:** Wendy Zheng <wendy.zheng@asongroup.com.au>; Rana Haddad <Rana.Haddad@campbelltown.nsw.gov.au>; Thomas Bertwistle <Thomas.Bertwistle@planning.nsw.gov.au>  
**Cc:** David Smith <David.Smith@campbelltown.nsw.gov.au>; Justin Crameri <jcrameri@texco.net.au>; Dora Choi <dora.choi@asongroup.com.au>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

No, if the lots on that road remain under sole ownership for the duration of works then those signs aren't as necessary.

Kind Regards,  
Shafi

---

**From:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Sent:** Thursday, 10 March 2022 1:59 PM  
**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>; Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>  
**Cc:** Shafiul Salam <[Shafiul.Salam@campbelltown.nsw.gov.au](mailto:Shafiul.Salam@campbelltown.nsw.gov.au)>; David Smith <[David.Smith@campbelltown.nsw.gov.au](mailto:David.Smith@campbelltown.nsw.gov.au)>; Justin Crameri <[jcrameri@texco.net.au](mailto:jcrameri@texco.net.au)>; Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Shafi

Thank you for providing the comments.

We can certainly update the CTMP for the ticket images.

In terms of providing the 'Roadworks ahead' and 'End roadworks' signs, access to / from the construction site only impacts Culverston Road which in its current form is a cul-de-sac with land under development on both sides by our client and for the duration of construction will only have construction vehicles. Do we still need those signs?

And the hours of work proposed in the CTMP is per the SSD-7500 condition for hours of work so we are bound by that unless DPIE changes it.

Please let us know if we still need to update the CTMP for the signage in question.

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>

**Sent:** Thursday, 10 March 2022 1:52 PM

**To:** Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>

**Cc:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>; Shafiul Salam <[Shafiul.Salam@campbelltown.nsw.gov.au](mailto:Shafiul.Salam@campbelltown.nsw.gov.au)>; David Smith <[David.Smith@campbelltown.nsw.gov.au](mailto:David.Smith@campbelltown.nsw.gov.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Thomas,

Apologies for the delay in the response to this matter. Shafi, Council's senior development engineer has reviewed the CMTP and provided the following comments;

- 1) Images of the tickets of those who drafted the TMP is to be provided.
- 2) 'Roadworks ahead' and 'End roadworks' signs need to be placed at both ends.

Notes: it appears the hours of work proposed in the CTMP is more restrictive (7am-5pm & 8am-1pm Sat) than what Council normally requires on DA's (7am-6pm & 8am-5pm Sat).

The Roadworks signs in point 2 are not wholly necessary since there is only 1 property owner on that road.

If you have any questions in relation to the above comments please direct them to Shafi ( I have copied him in this email)

Kind regards

Rana Haddad

---

**From:** Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>

**Sent:** Thursday, 3 March 2022 2:00 PM

**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana,

The Department is currently assessing this CTMP and wanted to know if Council were planning on providing comment on the CTMP? I note from our discussions with the Applicant, this was the last email received.

Kind regards,

**Tom Bertwistle**

Environmental Assessment Officer

Industry Assessments

**Department of Planning and Environment**

T (02) 8275 1025 E [thomas.bertwistle@panning.nsw.gov.au](mailto:thomas.bertwistle@panning.nsw.gov.au)

[dpie.nsw.gov.au](http://dpie.nsw.gov.au)

4 Parramatta Square  
12 Darcy Street  
Parramatta NSW 2150



I acknowledge the traditional custodians of the land and pay respects to Elders past and present. I also acknowledge all the Aboriginal and Torres Strait Islander staff working with NSW Government at this time.

Please consider the environment before printing this email.

---

**From:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>  
**Sent:** Monday, 21 February 2022 09:26  
**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

We are having a meeting with the engineers sometime this week to address this matter and respond to you as quickly as possible.

Kind regards  
Rana Haddad

---

**From:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Sent:** Monday, 21 February 2022 9:07 AM  
**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana

I do apologise for the emails but we do need to present to DPIE when the result of consultation with Council can be received – when would we be able to get feedback on this CTMP?

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Thursday, 17 February 2022 10:24 AM  
**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana

I appreciate that your traffic engineer has not started yet but can we get some idea of the timeline for the feedback on this CTMP?

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Tuesday, 15 February 2022 12:08 PM  
**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana

Thank you for calling me, apologies the SSD number is 7500, see below for the specific condition:

## TRAFFIC AND ACCESS

### Construction Traffic Management Plan

- B1. Prior to the commencement of construction, the Applicant must prepare Plan (CTMP) for the Development to describe the management of traffic during construction. The CTMP shall form part of the CEMP required by Condition 10 of the Development Consent Order (DCO).
- (a) be prepared by a suitably qualified and experienced person(s), in accordance with the requirements of the DCO;
  - (b) be submitted to the satisfaction of the Secretary prior to the commencement of construction;
  - (c) detail the measures that would be implemented to ensure road safety during earthworks and construction;
  - (d) detail heavy vehicle routes, access and parking arrangements;
  - (e) include a Driver Code of Conduct to:
    - (i) minimise the impacts of earthworks and construction on the local community;
    - (ii) minimise conflicts with other road users;
    - (iii) minimise road traffic noise; and
    - (iv) ensure truck drivers use specified routes;
  - (f) include a program to monitor the effectiveness of these measures;
  - (g) if necessary, detail procedures for notifying residents and the community of any potential disruptions to routes.

The full SSD is also attached as well as the CTMP for consultation.

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Tuesday, 15 February 2022 10:29 AM  
**To:** Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>



**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Rana

Frank has referred the 5-9 Culverston Rd, Minto CTMP to your department at the beginning of the month.

We appreciate it is a busy period but would be greatly appreciated if you are able to let us know when we be able to get some feedback on this CTMP?

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>

**Sent:** Tuesday, 15 February 2022 10:02 AM

**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>

**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>; Rana Haddad <[Rana.Haddad@campbelltown.nsw.gov.au](mailto:Rana.Haddad@campbelltown.nsw.gov.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

I tried calling Rana but a message goes to her phone. I believe she is very busy.

I sent your previous email to her on 1 February. You may wish to send an email directly to her.

Regards frank

---

**From:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>

**Sent:** Tuesday, 15 February 2022 9:57 AM

**To:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>

**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Frank

Thank you for letting me know.

Is there a way for me to contact Ms Rana Haddad directly?

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>  
**Sent:** Tuesday, 15 February 2022 9:56 AM  
**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Wendy,

I had previously sent the CTMP to one of the Planning Coordinators, Ms Rana Haddad in City Development to have someone call you.

I am not familiar with this Development so I asked City Development to get in contact. I have forwarded this email to Ms Rana Haddad.

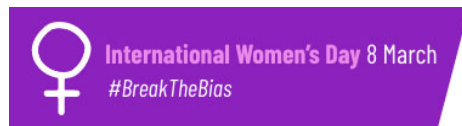
Regards frank

**Frank Sirc**  
Team Leader Traffic Investigations



M: [0428 568 416](tel:0428568416)  
E: [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
W: [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)  
Find us on 

Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.



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---

**From:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Sent:** Friday, 11 February 2022 9:45 AM  
**To:** Frank Sirc <[frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto

Hi Frank

How are you going?

We appreciate it is a busy period but would be you be able to let us know when we be able to get some feedback on this CTMP?

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

T: +61 2 9083 6601 | M: +61 401 969 768 | E: [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
A: Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng  
**Sent:** Monday, 31 January 2022 3:08 PM  
**To:** [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>  
**Subject:** 5-9 Culverston Rd, Minto

Hi Frank

Please see attached for the CTMP for the Stages 1 and 2 construction at 5-9 Culverston Road, Minto.

Please let us know if you have any feedback and whether anything needs to be updated before we submit to DPIE.

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

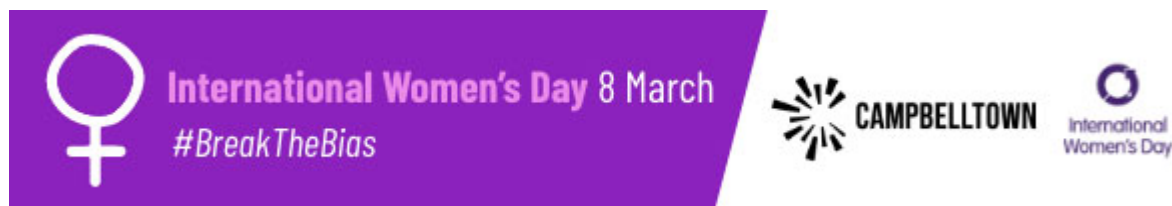
**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

**Frank Sirc**  
Team Leader Traffic Investigations



**M:** [0428 568 416](tel:0428568416)  
**E:** [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
**W:** [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)  
Find us on 

Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.



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**Frank Sirc**  
Team Leader Traffic Investigations



**M:** [0428 568 416](tel:0428568416)  
**E:** [frank.sirc@campbelltown.nsw.gov.au](mailto:frank.sirc@campbelltown.nsw.gov.au)  
**W:** [www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)  
Find us on 

Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.



**International Women's Day 8 March**  
*#BreakTheBias*



**CAMPBELLTOWN**



International  
Women's Day

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# Appendix F. TfNSW Consultation Record

## Wendy Zheng

---

**From:** Shoba Sivasubramaniam <Shoba.Sivasubramaniam@transport.nsw.gov.au>  
**Sent:** Wednesday, 9 March 2022 9:44 AM  
**To:** Wendy Zheng  
**Cc:** Thomas.Bertwistle@planning.nsw.gov.au  
**Subject:** RE: 5-9 Culverston Rd, Minto CTMP

Hi Wendy,

Reference is made to your email below seeking TfNSW advice to the submitted CTMP for the proposed warehouse and logistics hub at 5-9 Culverston Road, Minto, prior to lodgement with DPIE. Transport for NSW (TfNSW), Greater Sydney Division has reviewed the CTMP and endorse the proposed temporary construction arrangements, subject to the following conditions:

- Any Traffic Guidance Schemes (TGS) prepared are to comply with AS1742.3 and Transport for NSW's "Traffic Control at Worksites" manual and be signed by a person with TfNSW certification to prepare a TGS.
- Proponent must apply and obtain approval from the Transport Management Centre for a Road Occupancy Licence (ROL) for any required lane closures and/or Speed Zone Authorisations as part of the ROL that may impact the state road network or is within 100m of traffic signals.
- Access to be maintained for residents, businesses and emergency vehicles at all times.
- No marshalling or queuing of construction vehicles is to occur on public roads. Arriving vehicles that are not able to use parking bay/work zone must continue to a holding point until space becomes available.
- When heavy vehicles are entering or leaving the site a traffic controller is to be provided to manage any conflicts between pedestrians and heavy vehicles.
- Access to the site should be at the farthest point from the intersection as practicable to reduce additional conflicting vehicle manoeuvres.
- Transport for New South Wales reserve the right to alter the CTMP Conditions at any time to maintain safe and efficient traffic and pedestrian movements in this area.
- Any approved Works Zone should only be used for work activities. No infrastructure, including bins, tanks or traffic control equipment should be left on the road when the works zone is not in use by a vehicle. All non-vehicular items must be contained within the work area and not on the carriageway. When a work zone is not in use, the area/lane must be opened up to allow for normal trafficable conditions
- Any traffic control devices, including signage and line marking, should be installed by the proponent and must conform with Australian Standards 1742

Endorsement of the CTMP is not an approval to the type of traffic management or delineation devices used, nor is it an approval to any traffic guidance schemes depicted within the CTMP. It is assumed that the proponent has used type approved devices and has developed its traffic guidance schemes in accordance with the relevant Australian Standards and Guidelines.

The proponent is to ensure local residents, businesses, schools and other stakeholders in the affected area as well as emergency service organisations are notified of the changes associated with the CTMP, prior to its implementation.

Please ensure this CTMP is shared and adhered to by all contractors. If the CTMP changes, please forward a copy to [Developments.CJP@transport.nsw.gov.au](mailto:Developments.CJP@transport.nsw.gov.au) or further review and endorsement.

If you have any further questions please contact me on 0431446623 or email [development.sydney@rms.nsw.gov.au](mailto:development.sydney@rms.nsw.gov.au). I hope this has been of assistance.

Kind regards,  
Shoba

**Shoba Sivasubramaniam**

Development Assessment Officer  
Planning and Programs  
Greater Sydney  
**Transport for NSW**

**M** 0431446623 **E** [shoba.sivasubramaniam@transport.nsw.gov.au](mailto:shoba.sivasubramaniam@transport.nsw.gov.au)

[transport.nsw.gov.au](http://transport.nsw.gov.au)



**Transport  
for NSW**



I acknowledge the Aboriginal people of the country on which I work, their traditions, culture and a shared history and identity. I also pay my respects to Elders past and present and recognise the continued connection to country.

Please consider the environment before printing this email.

---

**From:** Shoba Sivasubramaniam

**Sent:** Tuesday, 22 February 2022 4:38 PM

**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>; Sharon Verhoeven <[Sharon.VERHOEVEN@transport.nsw.gov.au](mailto:Sharon.VERHOEVEN@transport.nsw.gov.au)>

**Subject:** RE: 5-9 Culverston Rd, Minto CTMP

Hi Wendy,

I apologise for the delay in getting back to you.

Review of this CTMP is pending internal comments but I hope to get a response back to within a week.

Kind regards  
Shoba

**Shoba Sivasubramaniam**

Development Assessment Officer  
Planning and Programs  
Greater Sydney  
**Transport for NSW**

M 0431446623 E [shoba.sivasubramaniam@transport.nsw.gov.au](mailto:shoba.sivasubramaniam@transport.nsw.gov.au)

[transport.nsw.gov.au](http://transport.nsw.gov.au)



Transport  
for NSW



I acknowledge the Aboriginal people of the country on which I work, their traditions, culture and a shared history and identity. I also pay my respects to Elders past and present and recognise the continued connection to country.

Please consider the environment before printing this email.

---

**From:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Sent:** Monday, 21 February 2022 9:08 AM  
**To:** Sharon Verhoeven <[Sharon.VERHOEVEN@transport.nsw.gov.au](mailto:Sharon.VERHOEVEN@transport.nsw.gov.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto CTMP

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Hi Sharon

Would you know when Shoba would be able to get back to me?

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

T: +61 2 9083 6601 | M: +61 401 969 768 | E: [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

A: Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Sharon Verhoeven <[Sharon.VERHOEVEN@transport.nsw.gov.au](mailto:Sharon.VERHOEVEN@transport.nsw.gov.au)>  
**Sent:** Thursday, 17 February 2022 12:33 PM  
**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto CTMP

Hi Wendy

I will forward your email to Shoba for action.

Kind regards



**Sharon Verhoeven**

Landuse Administration  
Planning & Programs  
Greater Sydney  
**Transport for NSW**

**M** 0000 000 000 **T** (02) 8849 2490 **E** [Sharon.Verhoeven@transport.nsw.gov.au](mailto:Sharon.Verhoeven@transport.nsw.gov.au)

---

**From:** Wendy Zheng [<mailto:wendy.zheng@asongroup.com.au>]  
**Sent:** Thursday, 17 February 2022 10:23 AM  
**To:** Development Sydney <[Development.Sydney@transport.nsw.gov.au](mailto:Development.Sydney@transport.nsw.gov.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto CTMP

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Hi Sharon

Again appreciate the update but would you or Shoba be able to let us know when we would be able to get some feedback on this CTMP?

Regards,  
**Wendy Zheng**  
Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)  
**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Sharon Verhoeven <[Sharon.VERHOEVEN@transport.nsw.gov.au](mailto:Sharon.VERHOEVEN@transport.nsw.gov.au)> **On Behalf Of** Development Sydney  
**Sent:** Tuesday, 15 February 2022 11:06 AM  
**To:** Wendy Zheng <[wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto CTMP

Hi Wendy

I will forward your email to Shoba the Planner assessing the CTMP

Kind regards

---

**From:** Wendy Zheng [<mailto:wendy.zheng@asongroup.com.au>]  
**Sent:** Tuesday, 15 February 2022 9:58 AM  
**To:** Development Sydney <[Development.Sydney@transport.nsw.gov.au](mailto:Development.Sydney@transport.nsw.gov.au)>  
**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>; Kevin Alawadhi <[Kevin.Alawadhi@transport.nsw.gov.au](mailto:Kevin.Alawadhi@transport.nsw.gov.au)>  
**Subject:** RE: 5-9 Culverston Rd, Minto CTMP

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Hi Development Team

We appreciate it is a busy period but would be you be able to let us know when we be able to get some feedback on this CTMP?

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

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---

**From:** Wendy Zheng

**Sent:** Friday, 11 February 2022 9:16 AM

**To:** Development Sydney <[Development.Sydney@transport.nsw.gov.au](mailto:Development.Sydney@transport.nsw.gov.au)>

**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>; [Kevin.Alawadhi@transport.nsw.gov.au](mailto:Kevin.Alawadhi@transport.nsw.gov.au)

**Subject:** RE: 5-9 Culverston Rd, Minto CTMP

Hi Development Team

Please let us know if you have any feedback for the CTMP and whether anything needs to be updated before we submit to DPIE.

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

---

**From:** Wendy Zheng

**Sent:** Monday, 31 January 2022 3:14 PM

**To:** Development Sydney <[Development.Sydney@transport.nsw.gov.au](mailto:Development.Sydney@transport.nsw.gov.au)>

**Cc:** Dora Choi <[dora.choi@asongroup.com.au](mailto:dora.choi@asongroup.com.au)>; [Kevin.Alawadhi@transport.nsw.gov.au](mailto:Kevin.Alawadhi@transport.nsw.gov.au)

**Subject:** 5-9 Culverston Rd, Minto CTMP

Hi Development Team

Please see attached for the CTMP for the Stages 1 and 2 construction at 5-9 Culverston Road, Minto.

Please let us know if you have any feedback and whether anything needs to be updated before we submit to DPIE.

Regards,

**Wendy Zheng**

Senior Traffic Design Engineer | Ason Group

**T:** +61 2 9083 6601 | **M:** +61 401 969 768 | **E:** [wendy.zheng@asongroup.com.au](mailto:wendy.zheng@asongroup.com.au)

**A:** Suite 17.02, Level 17, 1 Castlereagh Street, Sydney NSW 2000

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OFFICIAL

**APPENDIX C – STORMWATER MANAGEMENT PLAN**

# **STORMWATER MANAGEMENT PLAN - STAGES 1 & 2**

**SSD 7500 MOD1  
CULVERSTON ROAD  
MINTO NSW**

***Prepared For:*  
TEXCO  
12.1/160 Bourke Road  
ALEXANDRIA NSW 2015**

***Prepared by:*  
Costin Roe Consulting  
Level 1, 8 Windmill Street  
WALSH BAY NSW 2000**

***Rev: B***

**DOCUMENT VERIFICATION**

|                       |                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------|
| <b>Project Title</b>  | SSD7500 MOD1, Culverston Road, Minto, NSW                                             |
| <b>Document Title</b> | Stormwater Management Plan – Stages 1 & 2 SSD 7500 MOD1                               |
| <b>Project No.</b>    | Co14506.01                                                                            |
| <b>Description</b>    | Operational Stormwater Management Plan for SSD 7500 MOD1 for Stage 1 & 2 Construction |
| <b>Client Contact</b> | Mr Richard Porter, Texco                                                              |

|                    |                          |                  |
|--------------------|--------------------------|------------------|
|                    | <b>Name</b>              | <b>Signature</b> |
| <b>Prepared by</b> | Mark Labid & Mark Wilson | ML/ MW           |
| <b>Checked by</b>  | Mark Wilson              | MW               |
| <b>Issued by</b>   | Mark Wilson              | MW               |
| <b>File Name</b>   | 14506.01-01b.rpt         |                  |

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| <b>Date</b>  | <b>Revision</b> | <b>Issued to</b>         | <b>No. Copies</b> |
|--------------|-----------------|--------------------------|-------------------|
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| 31 Jan. 2022 | A               | Mr Richard Porter, Texco | PDF               |
| 21 Feb. 2022 | B               | Mr Richard Porter, Texco | PDF               |
|              |                 |                          |                   |
|              |                 |                          |                   |

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**APPENDICES**

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# 1 INTRODUCTION

## 1.1 Background

Costin Roe Consulting Pty Ltd has been commissioned by Texco to prepare this *Stormwater Management Plan (SMP)* for operation of the Stage 1 & 2 Warehouses, as approved by the NSW Department of Planning, Industry & Environment (DPIE) SSD-7500 MOD1 (dated 16 December 2020) consent.

The submission of the SMP for approval by DPIE has been completed in accordance with **Conditions of Consent (CoC) B11**. This SMP forms part of the *Construction Environmental Management Plan (CEMP)* as required of **CoC C1 & C2**.

This SMP has been prepared in accordance with the reporting requirements of **CoC C7**.

The subject area of this SMP comprises the stormwater management plan for the Stage 1 and 2 warehouse facilities. These works include stormwater drainage and management requirements for the two facilities throughout their development extent.

It is further noted that this SMP has been completed with consideration to the Costin Roe Consulting “*Civil Engineering Report (Ref: Co14506.00-02a.rpt)*” included in the Environmental Impact Statement (EIS) for the approved SSD-7500 MOD1, noting consistency with the original approved management measures included in the Arcadis Stormwater Management Plan dated 6 June 2016 included in the original SSD-7500 approval of 23 June 2017.

## 1.2 Scope

This SMP provides details of the design principles and construction requirements for stormwater management, as part of a CEMP required for the DPIE submission approval under **CoC B11**.

This plan details the overall estate stormwater management procedures for water quantity and quality, and for the Stage 1 and 2 warehouse facilities as described in **Section 1.1** and **Section 2.2** of this SMP.

This SMP does not include works within Stage 3, which does not form part of the current construction works.

The SMP will be read in conjunction with the *Civil Engineering* design package, drawings **Co14506.01-C10, C20, C25, C40 to C43, C45, C46, C50 to C52 and C65** as included in **Appendix A**.

### 1.3 Conditions of Consent Matrix

The SMP and associated stormwater design drawings have been completed in accordance with the approved stormwater management strategy and EIS approved by the NSW DPIE in SSD-7500 MOD1.

We provide the following tables which confirms how and where, within the report or respective drawings and models, each of the requirements of SSD-7500 MOD1 **CoC B10** and **B11**, and the reporting requirements of **CoC C7** have been met.

#### **SSD7500 MOD1 Consent Condition Matrix**

| <b>CoC No.</b>               | <b>Item</b>                                                                                                                                                                                    | <b>Response</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stormwater Management</b> |                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>B10</i>                   | <i>The Applicant must design, install and operate a stormwater management system as generally described in the conceptual design included in the EIS for the Development. The system must:</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>B10 (a)</i>               | <i>be designed by a suitably qualified and experienced person(s);</i>                                                                                                                          | <p>This SMP has been prepared for the applicant by Costin Roe Consulting Pty Ltd, civil and structural consulting engineers. Costin Roe Consulting is experienced in the preparation and implementation of <i>Stormwater Management Plans</i> for industrial developments of similar scope to this development.</p> <p>Recent similar SSD approved projects include The Moorebank Intermodal Precinct East and West, The Eastern Creek Business Park Stages 4 &amp; 5, The Horsley Drive Business Park Stages 1 &amp; 2 at Wetherill Park, Altis First Estate at Erskine Park, Prestons Industrial Estate at Prestons, The Yards Industrial Estate at Kemps Creek and the DEXUS Quarry at Greystanes.</p> |
| <i>B10 (a)</i>               | <i>be in accordance with the conceptual design in the EIS and applicable Australian Standards;</i>                                                                                             | <p>The SMP and associated design drawings have been prepared generally in accordance with the approved EIS, Australian &amp; New Zealand Standard AS/NZS 3500.3:2003 Plumbing and drainage – Stormwater Drainage, Campbelltown City Council requirements (including <i>Campbelltown DCP Volume 2 Engineering design for Development June 2009</i>) and per</p>                                                                                                                                                                                                                                                                                                                                            |

| CoC No. | Item                                                                                                                                                   | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                                                                                                                                                        | accepted engineering and industry best practice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| B10 (b) | <i>identify existing stormwater infrastructure to be maintained, demolished or upgraded to support the Development;</i>                                | <p>The SMP and associated design drawings (refer <b>Appendix A</b>) identify existing stormwater infrastructure and confirms existing infrastructure which is to be maintained, demolished or upgraded to support the Development.</p> <p>It is noted that existing systems will be demolished to accommodate the new developments, however discharge locations are to be maintained and utilised for discharge, as proposed in the approved EIS concepts.</p>                                                                     |
| B10 (c) | <i>detail the location and design specifications of gross pollutant traps;</i>                                                                         | The SMP and associated design drawings (refer <b>Appendix A</b> ) detail the location and design specifications of the nominated gross pollutant traps, and any other stormwater treatment devices included in the design.                                                                                                                                                                                                                                                                                                         |
| B10 (d) | <i>ensure that the system capacity has been designed in accordance with Managing Urban Stormwater - Soils and Construction Vol. 1 (Landcom, 2004);</i> | <p>The stormwater management system capacity, during construction, has been designed in accordance with <i>Managing Urban Stormwater - Soils and Construction Vol. 1 (Landcom, 2004)</i>.</p> <p>During operation, design of the drainage system allows for conveyance of the 5% AEP inground and 1% AEP overland based on hydrological runoff methods included in <i>Australian Rainfall and Runoff (Engineers Australia, 2016)</i> and hydraulic designs per <i>Managing Urban Stormwater: Council Handbook (EPA, 1997)</i>.</p> |
| B10 (e) | <i>divert existing clean surface water around operational areas of the site; and</i>                                                                   | The SMP and associated design drawings (refer <b>Appendix A</b> ) confirms conveyance measures for clean water diversion during construction, and during operation.                                                                                                                                                                                                                                                                                                                                                                |
| B10 (f) | <i>describe the measures which would be implemented to maintain the</i>                                                                                | <b>Section 7</b> of this SMP includes maintenance and monitoring                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| CoC No. | Item                                                                                                                                                                                                                                                                                                                              | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <i>infrastructure during the life of the Development, including maintenance, monitoring and annual reporting.</i>                                                                                                                                                                                                                 | requirements for infrastructure throughout the life of the development.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| B11     | <i>Prior to the commencement of construction, the Applicant must prepare a Stormwater Management Plan to the satisfaction of the Planning Secretary. The Plan must form part of the CEMP required by conditions C2 and must:</i>                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| B11 (a) | <i>be prepared by a suitably qualified engineer prior to the commencement of construction;</i>                                                                                                                                                                                                                                    | <p>This SMP has been prepared for the applicant by Costin Roe Consulting Pty Ltd, civil and structural consulting engineers. Costin Roe Consulting is experienced in the preparation and implementation of <i>Stormwater Management Plans</i> for industrial developments of similar scope to this development.</p> <p>Recent similar SSD approved projects include The Moorebank Intermodal Precinct East and West, The Eastern Creek Business Park Stages 4 &amp; 5, The Horsley Drive Business Park Stages 1 &amp; 2 at Wetherill Park, Altis First Estate at Erskine Park, Prestons Industrial Estate at Prestons, The Yards Industrial Estate at Kemps Creek and the DEXUS Quarry at Greystanes.</p> |
| B11 (b) | <i>be prepared in consultation with Council. As part of this consultation, in addition to Condition A11, the Applicant shall provide all drainage modelling data for the Development (MUSIC, DRAINS or the like) to Council;</i>                                                                                                  | The SMP, in DRAFT, has been provided to Campbelltown City Council for comment. Relevant modelling has been included in the submission as per correspondence in <b>Appendix B</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| B11 (c) | <i>be prepared generally in accordance with the:</i><br><i>(i) Flooding and Stormwater Report dated 27 April 2016 and accompanying drawings prepared by Arcadis;</i><br><i>(ii) Stormwater Management Plan, dated 6 June 2016, prepared by Arcadis;</i><br><i>(iii) the stormwater management system under Condition B10; and</i> | <p>The SMP and associated design drawings (refer <b>Appendix A</b>) have been prepared in general accordance with the noted documents, included in the EIS approved under SSD-7500, and the more recent design concepts, stormwater management plan Costin Roe Consulting “Civil Engineering Report (Ref: <b>Co14506.00-02a.rpt</b>)”, and associated design drawings included in <i>Appendix A</i> of the SSD-</p>                                                                                                                                                                                                                                                                                       |

| CoC No.                             | Item                                                                                                                                         | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | <i>(iv) relevant requirements of Council and OEH;</i>                                                                                        | <p>7500 MOD1 consent approval instrument.</p> <p>This SMP has been prepared in accordance with both CoC B10 and B11 of the SSD-7500 MOD1 approval, and completed in accordance relevant Council and OEH requirements.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| B11 (d)                             | <i>detail management measures for minor and major flood events;</i>                                                                          | <p>The SMP has been prepared with consideration to minor and major flood events.</p> <p>The surface water drainage system allows for conveyance of minor (5% AEP) and major (1% AEP) storm events.</p> <p>The site levels more than 0.5m above the 1% AEP flood level from regional flooding associated with Bow Bowing Creek on the west and McBarron Creek on the north. Given the site is not affected by major flood events, management measures required for major floods are limited.</p> <p>In events greater than the 1% AEP event to the PMF, a separate Flood Emergency Response Plan (FERP) has been prepared as required of CoC B13 of the SSD-7500 MOD1 approval. Refer to separate FERP by Costin Roe Consulting, reference <b>Co14506.01-02.rpt</b>.</p> |
| B11 (e)                             | <i>identify all building and roadworks to be constructed relevant to the Construction Certificate to which the works relate; and</i>         | The design drawings in <b>Appendix A</b> identify all civil works to be constructed, including buildings and pavements. We note that no public roadworks are required or proposed as part of the Stage 1 and 2 construction works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| B11 (f)                             | <i>incorporate design plans and accompanying design notes.</i>                                                                               | The SMP includes associated design drawings which incorporate plans and design notes and specifications. Refer <b>Appendix A</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Management Plan Requirements</b> |                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| C7                                  | <i>The Applicant must ensure that the environmental management plans and sub-management plans required under conditions C1, C2 and C4 of</i> | This SMP has been prepared for the applicant by Costin Roe Consulting Pty Ltd, civil and structural consulting engineers. Costin Roe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| CoC No. | Item                                                                                                                                                                                                                                                                                                                                                                                                    | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <i>this consent are prepared by a suitably qualified person or persons in accordance with best practice and include:</i>                                                                                                                                                                                                                                                                                | <p>Consulting is experienced in the preparation and implementation of <i>Stormwater Management Plans</i> for industrial developments of similar scope to this development.</p> <p>Recent similar SSD approved projects include The Moorebank Intermodal Precinct East and West, The Eastern Creek Business Park Stages 4 &amp; 5, The Horsley Drive Business Park Stages 1 &amp; 2 at Wetherill Park, Altis First Estate at Erskine Park, Prestons Industrial Estate at Prestons, The Yards Industrial Estate at Kemps Creek and the DEXUS Quarry at Greystanes.</p> |
| C7(a)   | <i>Detailed Baseline Data</i>                                                                                                                                                                                                                                                                                                                                                                           | Detailed baseline data pertaining to stormwater is included in <b>Section 2</b> and <b>Appendix C</b> of the SMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| C7(b)   | <i>Details of:</i><br><i>(i) The relevant statutory requirements (including relevant approval, licence or lease conditions);</i><br><i>(ii) Any relevant limits or performance measures and criteria; and</i><br><i>(iii) The specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures.</i> | <p>Statutory requirements are included in <b>Section 3.3</b> of the SMP.</p> <p>Stormwater objectives and discharge control criteria, being the measure of performance and performance indicators, are provided in <b>Section 4</b> of the SMP.</p>                                                                                                                                                                                                                                                                                                                  |
| C7(c)   | <i>A description of the management measures that would be implemented to comply with the relevant statutory requirements, limits or performance measures and criteria</i>                                                                                                                                                                                                                               | Measures required to be implemented are included in the <b>Section 3</b> and <b>4</b> of the SMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| C7(d)   | <i>A program to monitor and report on the:</i><br><i>(i) Impacts and environmental performance of the development</i><br><i>(ii) Effectiveness of the management measures set out</i>                                                                                                                                                                                                                   | <p>Inspection and monitoring requirements have been included in <b>Section 7</b> of the SMP.</p> <p>Additional reference to <b>Sections 3.5 to 3.9</b> should be made for contingency planning, incident classification and notification, environmental auditing and reporting, non-compliance, non-</p>                                                                                                                                                                                                                                                             |

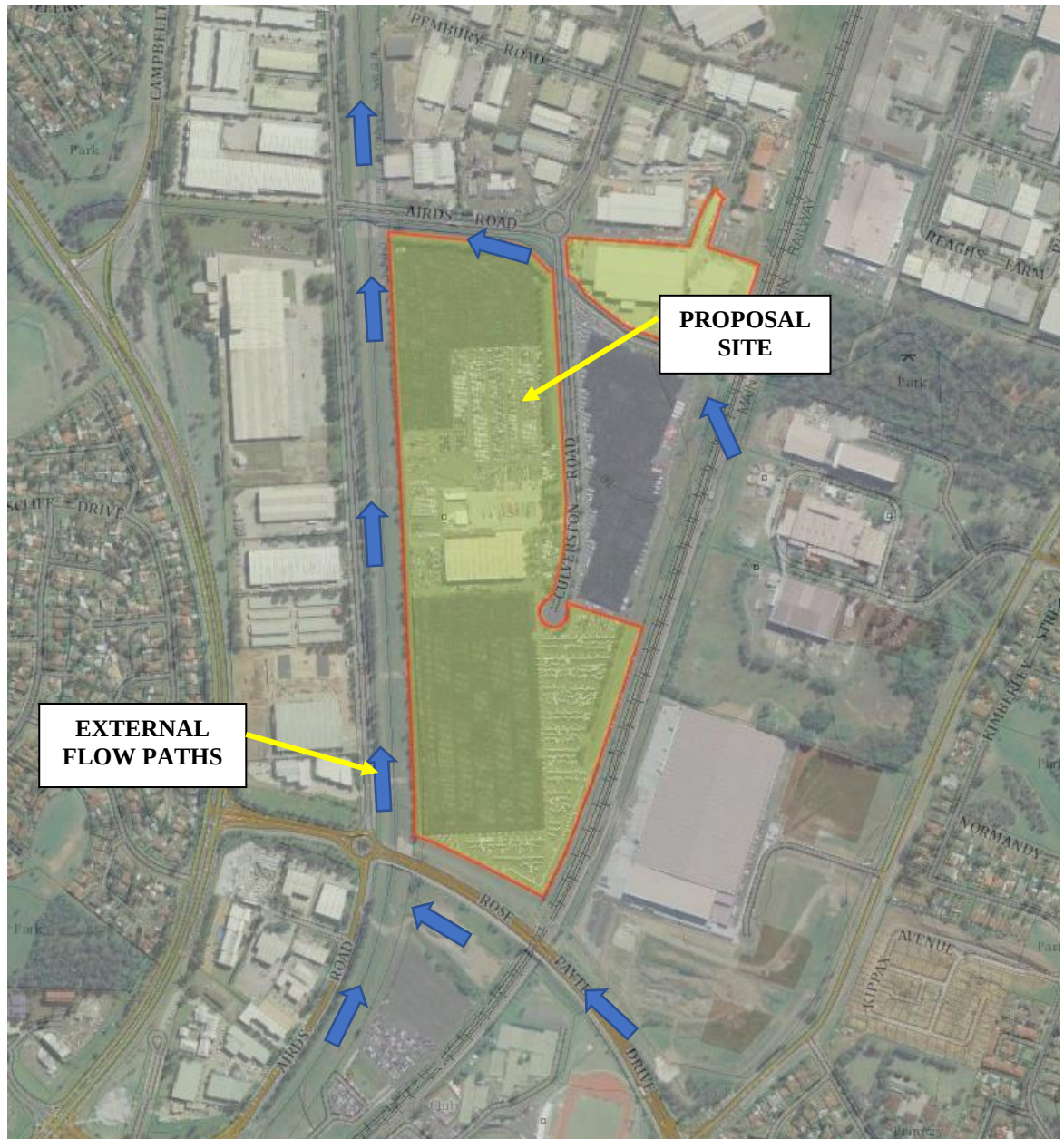
| <b>CoC No.</b> | <b>Item</b>                                                                                                                                                                                                                                                         | <b>Response</b>                                                                                                                                                                                                    |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | <i>pursuant to paragraph (c) above.</i>                                                                                                                                                                                                                             | conformance and actions, and review and improvement requirements, respectively.                                                                                                                                    |
| <i>C7(e)</i>   | <i>A contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.</i>                                                            | Reference to <b>Section 3.5</b> of the SMP for contingency planning.                                                                                                                                               |
| <i>C7(f)</i>   | <i>A program to investigate and implement ways to improve the environmental performance of the development over time.</i>                                                                                                                                           | Reference to <b>Section 3.9</b> should be made for review and improvement requirements.                                                                                                                            |
| <i>C7(g)</i>   | <i>A protocol for managing and reporting any:</i><br><i>(i) Incident and any non-compliance (specifically including any exceedance of the impact assessment criteria);</i><br><i>(ii) Complaint;</i><br><i>(iii) Failure to comply with statutory requirements;</i> | Reference to <b>Sections 3.6 to 3.8</b> should be made for, incident classification and notification, environmental auditing and reporting, non-compliance, non-conformance and actions requirements respectively. |
| <i>C7(h)</i>   | <i>A protocol for periodic review of the plan.</i>                                                                                                                                                                                                                  | Reference to <b>Sections 3.9</b> should be made review and improvement requirements.                                                                                                                               |



## 2 DEVELOPMENT SITE

### 2.1 Site Description

The development site is located on the western side of Culverston Road, South of Airds Road, east of Bow Bowing Creek trunk drainage channel and north of Rose Payton Drive in the suburb of Minto. The proposal site and Stage 1, 2 and 3 Warehouses are located on the northern portion of the project area, as shown in **Figure 2.1**.



**Figure 2.1 Locality Plan & Flow Paths** (Source: Six Maps 2021)

The approved proposal site encompasses an area of 29.36 Ha. The land is currently being used as a car and vehicle storage facility and comprises significant impervious surfaces (approx. 95% site coverage) with hail nets for vehicle protection.

The proposal site is noted to be within a long established industrial area of Minto and is surrounded by many industrial developments and no nearby residential receivers.

The following descriptions of the existing site are:

- The land use on the site is currently industrial and a fully developed and paved vehicle storage facility.
- Formal drainage systems and dedicated pipe drainage outlets to Bow Bowing Creek and Culverston Road exist. There are three outlets available for the Stage 1, 2 and 3 Warehouses to Bow Bowing Creek and a further three available to Culverston Road.
- Watercourses are identified adjacent on the site, noting these consist of engineered channels as part of trunk drainage infrastructure for the Minto industrial precinct – refer **Figure 2.1** and **Section 2.7**.
- Previous survey information shows that the land falls from the north and north-west to the east and south-east corner of the site. The highest level on the site, at RL 56.65m AHD, is located at the south-east corner of the site and the lowest level is RL 46.0m AHD at the north-west corner.
- Inverts within Bow Bowing Creek are shown to vary from RL 45m AHD (upstream southern end of site) to RL 43m AHD (downstream adjacent to northern end of the site).
- The grades over the site are in the order of 1-2%.

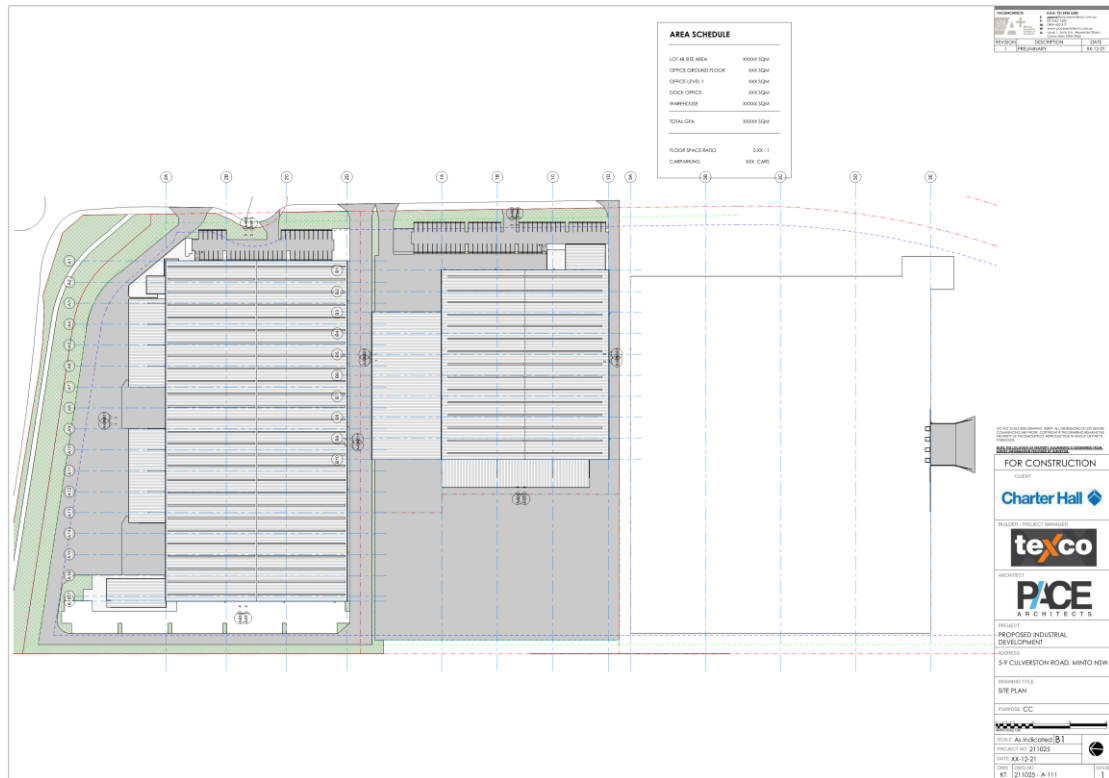
## 2.2 Proposed Development Description

The proposed construction works for this submission comprises construction of two warehouse facilities, the Stage 1 & 2 Warehouses.

The development comprises the following elements:

- Two steel framed warehouse buildings (noting the Stage 3 & 4 Warehouse is not part of this SMP);
- Ancillary office space on the east of Stage 1 and 2 warehouse buildings;
- At grade car parking on the street frontage of buildings with access from the existing Culverston Road cul-de-sac;
- Truck circulation and loading areas;
- Fire brigade access around the full perimeter of each building and development site; and
- Stormwater drainage and flood management systems completed in accordance with the Stormwater Management Strategy approved under SSD 7500.

Refer to **Figure 2.2** for the proposed site layout as produced by Pace Architects.



**Figure 2.2. Proposed Development Layout**

Adjustment to the floor levels of buildings are also proposed as noted below and set out in **Table 1.1**. We note the proposed floor levels are within the approved variance of plus or minus 0.5m.

Proposed building levels are as follows:

- Stage 1 = 48.0m AHD
- Stage 2 = 48.0m AHD

We note the Stage 3 & 4 developments do not form part of this SMP.

### 2.3 Existing Geology & Soils

A geotechnical assessment has been completed by Golder Associates as part of the SSD7500 EIS. The site conditions and proposed modification conditions remain consistent between the SSD7500 approval and modification proposal. Refer report *Geotechnical Investigation for Warehousing Development* (Golders Ref: 1648232-002-R-Rev0, dated April 2016) for detailed information pertaining to geotechnical profile and investigations.

The 1:100,000 Wollongong-Port Hacking Geological Sheet (GS 9029-9129, 1985) indicates that ground conditions at the site comprise of Quaternary paleochannel deposits, including fluvial sand, clay and silt. The paleochannel is underlain by Ashfield Shale and Hawkesbury Sandstone.

Acid Sulfate Risk Maps (ASRIS) indicate the area is in a region with no known occurrence of acid sulfate soils. Acid sulfate soils are generally only expected at elevations of less than 5 m AHD in coastal areas (RTA,2005), and are not expected at the site due to its elevation of approximately 45 to 50 m AHD.

The Golders investigation describes the subsurface profile as follows:

## **“Unit 1 – Fill**

### **Unit 1A - Topsoil**

*Topsoil was only observed on the fringes of the site, generally associated with the surrounding garden areas. Topsoils generally consisting of clays and silts, were encountered in four boreholes (GA-BH02, GA-BH03, GA-BH04 and GA-BH05). The topsoils generally extend to depths between 0.1 m and 0.4 m depth below ground surface, with an average thickness of 200 mm. At the time of the investigation the topsoil was generally dry and underlain by “Fill” (i.e. soil Unit 1c described below).*

### **Unit 1B – Hardstand Pavement**

*An asphalt or concrete hardstand covers the majority of the site. An asphalt pavement surface approximately 30 mm thick was encountered at two borehole locations (GA-BH07 and GA-BH08). The asphalt was observed to be generally dark grey, poorly bound and was underlain by a thin layer of sub-base gravelly sand, extending to depths of 0.4 m and 0.2 m below the ground surface.*

### **Unit 1C – Fill**

*Two soil stockpiles running roughly north-south, parallel to Culverston Road were observed during the investigation. Existing fill material was encountered at all borehole locations and generally comprises medium plasticity silty clay, clay and sandy clay with some angular gravel. It was generally found immediately beneath the topsoil/asphalt pavement or at existing ground surface level and extended to depths between 1.6 m and 4.4 m below ground surface.*

*Fill was also encountered in all of the hand auger locations within the soil stockpiles. All hand auger holes terminated within the fill unit.*

*In situ testing (SPTs and pocket penetrometers) indicate the fill is generally very stiff, with firm layers encountered immediately below sub-base layers in boreholes GA-BH07 and GA-BH08.*

## **Unit 2 – Alluvium**

*The alluvial material encountered generally comprises high plasticity grey and brown clay and was encountered beneath the Unit 1C fill in all boreholes. The exception to this is borehole GA-BH06, which was terminated within the fill at 3 m depth. The alluvium was found at depths as shallow as 1.6 m (GA-BH07) but generally began at about 3 m and continued to greater than 8 m depth below ground surface.*

*In situ testing (SPTs and pocket penetrometers) indicated the fill is generally stiff to very stiff, with some zones of firm or hard material (GA-BH04). ”*

## **2.4 Groundwater**

The Golder Associated investigation identified groundwater at depths of 4-6m below ground level.

The impact on the overall groundwater system was reviewed and confirmed acceptable. Impact as a result of the currently proposed development are negligible given the existing industrial development on the land and anticipated filling on the site

The effect on impact is considered to meet the requirements of the SEARS and initial responses by the NSW DPI.

## 2.5 Climate and Meteorology

The Minto area experiences relatively mild temperatures and moderate rainfall, with a yearly average rainfall of about 780mm, based on records from a nearby observation site at Horsley Park since 1997 (Station 67119).

Typically, the wettest month (mean rainfall) is February, and driest is September. It is noted that July and August show similar mean rainfall amounts to September.

The annual mean minimum temperature is 12.1°C and the mean maximum temperature is 23.9°C. The hottest month is usually January (mean maximum of 30.1°C) and the coldest month is usually July (mean minimum of 5.8°C).

Climate statistics and average annual rainfall data and rainfall patterns relevant to this site (Horsley Park as sourced from Australian Bureau of Meteorology (BOM)) are included for reference in **Appendix C** of this **SMP**.

## 2.6 Existing Drainage Systems

Existing formal drainage systems are present on the development site constructed and operating to service the existing car storage and processing facility.

The existing system generally comprises graded pavements which direct site runoff as sheet flow to a series of field inlet pits and inground drainage pipes.

Discharge from the site is made via existing dedicated pipe drainage outlets to Bow Bowing Creek and/ or systems in Culverston Road. There are three outlets available for the Stage 1, 2 and 3 Warehouses to Bow Bowing Creek and a further three available to Culverston Road.

## 2.7 Flooding

As part of the SSD 7500 EIS, an assessment of flooding in relation to the site was completed. Outcomes of the flood assessment are included in the Arcadis *Appendix 10 - Flooding & Drainage* document, and subsequent RtS letter dated 23 September 2016.

The assessments completed, and approved, in 2016 were made with consultation with CCC. The proposed development remains consistent with the 2016 assessment and approval.

The 2016 assessment confirmed the following outcomes and recommendations:

- The 1% AEP flood levels adjacent to the Stage 1, 2 and 3 Warehouses are confirmed in the RtS letter to be RL 46.86m AHD to RL 45.95m in the post development conditions (refer **Figure 2.2** and **2.3**).
- Flood impacts resulting from the development are noted by CCC as being marginal in the post development conditions and the difference in flood level between the filled site and unfilled site “are generally small”.

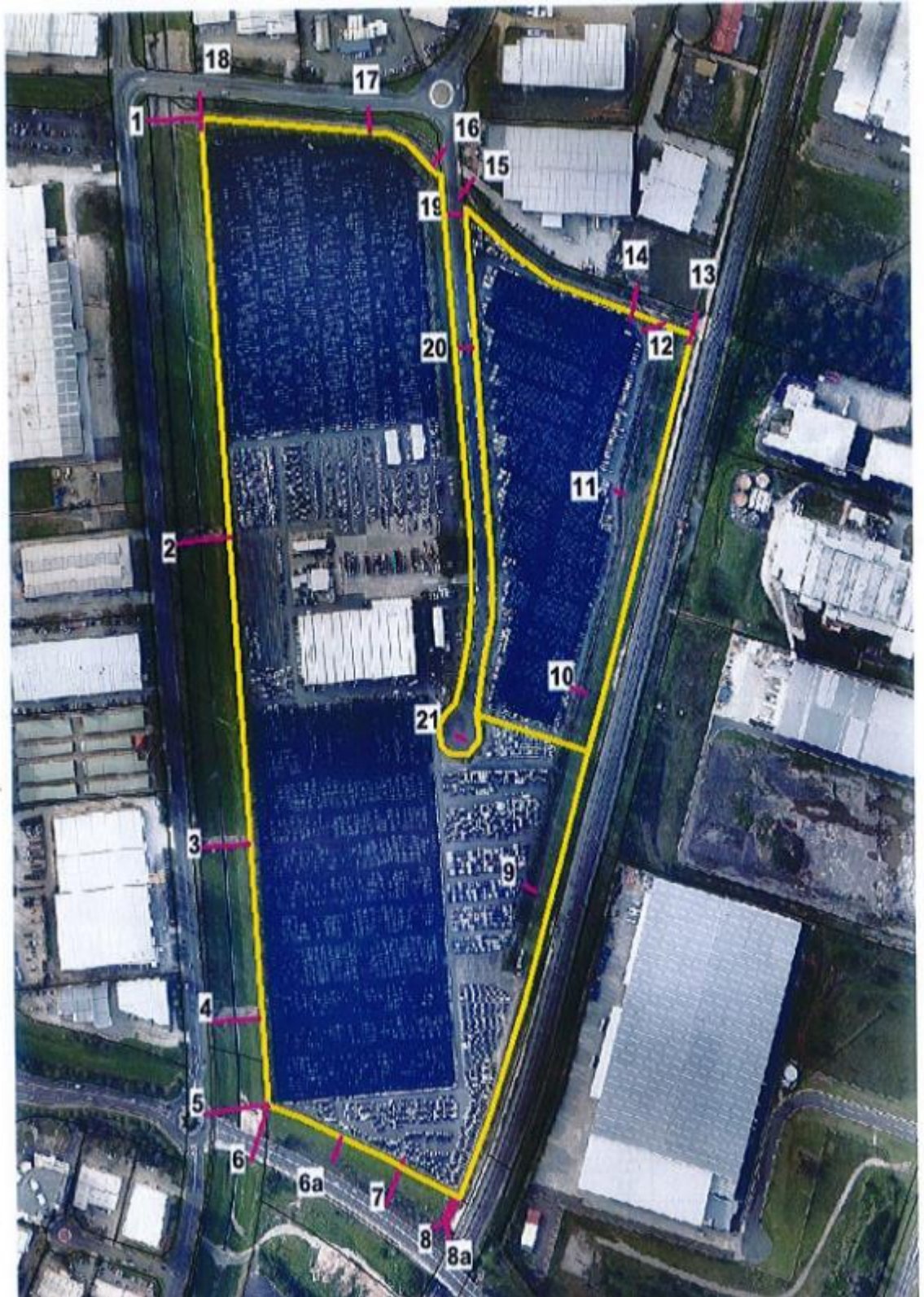
- The site is noted to be inundated in the PMF hence consideration to risk to property and life is required. The Stage 1 & 2 developments, per CoC B13, are noted to require a Flood Emergency Response Plan (FERP) for users of the site. The FERP informs users of flood behaviour, and flood management measures during flood events. Refer separate FERP by Costin Roe Consulting reference **Co14506.01-02.rpt**.

**Figures 2.2 and 2.3** show flood level locations and flood levels for the 1% AEP event in the pre and post development conditions, as per the RtS letter dated 23 September 2016. Relevant locations to the modification proposal are Locations 1, 2 and 3. Of lesser importance, though still relevant, are locations 16, 17 and 18.

Flood planning levels (FPL) per councils requirement of 0.5m above the 1% AEP are RL 47.36m AHD to RL 46.45m. It is confirmed the proposed building levels (refer Section 2.2) meet councils FPL requirements.

Given the proposed modification proposal remains consistent with the outcomes and recommendations of the 2016 assessment and approval, no further flood assessments or modelling is required for this modification application.





**Figure 2.2. 1% AEP Flood Level Location Map**

1% AEP flood levels based on the existing topographic condition (Column 1) and raised the site by 10m (column 2)

| Details of the flood way                                       | Location | 1% AEP flood level (Min. Floor level) based on the existing topographic condition (metres AHD) | 1 % flood levels (raised development site by 10m) (metres AHD) |
|----------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
|                                                                |          | 1                                                                                              | 2                                                              |
| Bow Bowing Channel                                             | 1        | 45.88                                                                                          | 45.95                                                          |
|                                                                | 2        | 46.85                                                                                          | 46.86                                                          |
|                                                                | 3        | 48.50                                                                                          | 48.55                                                          |
|                                                                | 4        | 49.75                                                                                          | 49.76                                                          |
|                                                                | 5        | 50.05                                                                                          | 50.05                                                          |
| Formalised grass channel to the south (Rose Payten Drive side) | 6        | 50.05                                                                                          | 50.05                                                          |
|                                                                | 6a       | 50.08                                                                                          | 50.10                                                          |
|                                                                | 7        | 50.20                                                                                          | 50.20                                                          |
|                                                                | 8        | 50.80                                                                                          | 50.85                                                          |
|                                                                | 8a       | 51.20                                                                                          | 51.20                                                          |
| Formalised fabriform channel within the site                   | 9        | 48.00                                                                                          | 48.16                                                          |
|                                                                | 10       | 47.20                                                                                          | 47.28                                                          |
|                                                                | 11       | 47.08                                                                                          | 47.14                                                          |
|                                                                | 12       | 47.06                                                                                          | 47.13                                                          |
| Fabriform channel to the north                                 | 13       | 48.88                                                                                          | 48.88                                                          |
|                                                                | 14       | 47.03                                                                                          | 47.09                                                          |
|                                                                | 15       | 46.04                                                                                          | 46.12                                                          |
|                                                                | 16       | 45.85                                                                                          | 45.86                                                          |
|                                                                | 17       | 45.78                                                                                          | 45.83                                                          |
|                                                                | 18       | 45.78                                                                                          | 45.83                                                          |
| Culverston Road                                                | 19       | 46.27                                                                                          | 46.26                                                          |
|                                                                | 20       | 46.50                                                                                          | 46.50                                                          |
|                                                                | 21       | 48.00                                                                                          | 48.12                                                          |

**Figure 2.3. 1% AEP Flood Levels**



### 3 GENERAL REQUIREMENTS

#### 3.1 Introduction & Reference Documents

This SMP has been prepared with the purpose of confirming the stormwater management strategy for the Stage 1 & 2 SSD-7500 MOD1 development.

The civil engineering and stormwater drainage designs are shown on drawings included in **Appendix A**.

This SMP is to be read in conjunction with the guidelines included in the document *Managing Urban Stormwater - Soils and Construction Volume 1 (Landcom 2004)* for any works during construction.

#### 3.2 Roles and Responsibilities

1. The applicant and their management team are responsible for the implementation of this SMP during operational phase.
2. During construction all personnel have the responsibility to stop works if there is potential for a safety or environmental incident to occur per the SMP and CEMP.
3. The key roles and responsibilities for the Project personnel in relation to stormwater management are outlined below in **Table 3.1** and **3.2**.

**Table 3.1 Roles and Responsibilities (During Construction) per SMP**

| Role                                                | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contractor's Project Manager (Contractor's PM)      | <p>Manage the delivery of the construction process in relation to soil and water quality management at the site in conjunction with the Contractor's EM.</p> <p>Provide for training in erosion and sediment control for personnel directly involved with the implementation of this plan, as required.</p> <p>Identify and allocate Project resources to implement the requirements of this plan.</p> <p>Oversee the implementation and maintenance of this plan.</p> |
| Contractor's Construction Manager (Contractor's CM) | <p>Communicate with all workers including sub-contractors regarding compliance with the SMP.</p> <p>Record and communicate volume of spoil imported to site to the Principal's Representative on a weekly basis.</p> <p>Coordinate the implementation and maintenance of erosion and sediment controls and provide support for the Contractor's EM.</p>                                                                                                                |
| Contractor Environmental                            | Co-ordinate to undertake monthly inspections and report on implementation of this plan.                                                                                                                                                                                                                                                                                                                                                                                |

| Role                         | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manager<br>(Contractor's EM) | <p>Recommend any improvements to the plan and site control measures in conjunction with the engineer.</p> <p>Develop, implement, monitor and update the progressive ESCPs as required.</p> <p>Direct works to be performed in accordance with this plan.</p> <p>Review works proposed within the riparian zone.</p> <p>Maintain site records confirming achievement of water quality objectives prior to discharge.</p> <p>Maintain relevant waste disposal records</p> <p>Co-ordinate the sampling and assessment of waters and sediments in control structures to enable classification and reuse, discharge or disposal in an appropriate manner on or off site.</p> <p>Maintain the site water quality register.</p> <p>Record environmentally relevant incidents.</p> <p>Manage and respond to reported incidents.</p> |
| Site Supervisor              | <p>Present toolbox talks that include the requirements of this plan.</p> <p>Inform staff of their obligation to comply with ESCPs and SMP.</p> <p>Communicate the volume of spoil imported to site on a daily basis to the Contractor's CM.</p> <p>Manage and respond to reported incidents.</p> <p>Approval to make new infrastructure operational.</p> <p>Co-ordinate and report on daily and weekly inspections.</p> <p>Co-ordinate inspection and monitoring of equipment washdowns, waste handling and other construction related activities that influence the site's management of soils and water.</p>                                                                                                                                                                                                              |
| All Personnel                | <p>Comply with the requirements of this SMP.</p> <p>Report any observed failure of ERSED infrastructure to the Contractor's EM or Site Supervisor.</p> <p>Report all environmental incidents to the Site Supervisor and/or the Contractor's EM.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

**Table 3.2 Roles and Responsibilities (During Operation)**

| <b>Role</b>                    | <b>Responsibilities</b>                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant/ Estate Owner        | <p>Provide for training in stormwater management for personnel directly involved with the implementation of this plan, as required.</p> <p>Identify and allocate Project resources to implement the requirements of this plan.</p> <p>Oversee the implementation and maintenance of this plan.</p> <p>Ensure all measures are performing adequately throughout the operation of the estate in perpetuity.</p> |
| Estate Management Body         | <p>Ensure maintenance and monitoring of the stormwater management measures are undertaken in accordance with <b>Section 7</b> and <b>Appendix D</b>.</p>                                                                                                                                                                                                                                                      |
| Individual Lot Owners/ Tenants | <p>Ensure internal drainage systems function adequately and maintenance and monitoring of their own site-specific stormwater management measures (rainwater tanks, individual drainage system) are undertaken in accordance with <b>Section 7</b> and <b>Appendix D</b>.</p> <p>Ensure personnel are educated in the overall estate stormwater management conditions.</p>                                     |

### 3.3 Legal and Regulatory Requirements

The below sets out the legislation and planning instruments considered in the preparation of this sub plan. It is noted that the regulatory framework for the project is set out in the *CEMP*.

The Project has been approved under the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The SMP has been prepared in accordance with the CoC of SSD-7500 MOD1 (as set out in **Section 1.3** of the SMP) and forms a subsection of the *CEMP*. This plan is to be read in conjunction with the *CEMP* and any statutory requirements and other management measures included in the *CEMP*.

The plan has been completed in accordance with all relevant approvals and regulatory framework.

**Table 3.3** lists regulatory guidelines and documents relevant to the SMP.

**Table 3.2. Regulatory Documents and Guidelines**

| <b>Legislation</b>                                       | <b>Description</b>                                                                                                                                                                                                                                                                                                                                          | <b>Relevance to the SMP</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Environmental Planning and Assessment Act 1979</i>    | This Act establishes a system of environmental planning and assessment of development Projects for the State.                                                                                                                                                                                                                                               | The CoCs and obligations issued under Part 4 of the EP&A Act are addressed in this plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>Protection of the Environment Operations Act 1997</i> | The objectives of this Act relate to the protection of the environment through pollution prevention and cleaner production, among others.                                                                                                                                                                                                                   | <p>Relevant sections of the Act, including duties to report pollution incidents and disposal regulations have been incorporated into this plan and incident response procedures.</p> <p>A key legislative requirement applicable to construction soil and water management is Section 120 of the Protection of the Environment Operations Act 1997 which relates to pollution of waters and the need to implement all reasonable and feasible measures to minimise the risk of pollution of waters.</p> <p>Part 5.7 of the Act requires that a pollution incident causing or threatening material harm to the environment be notified to EPA and other relevant authorities as outlined in the CEMP. Material harm constitutes actual or potential harm to the health or safety of humans and/or ecosystems that is not trivial, or results in actual or potential loss or property damage of amounts in excess of \$10,000 in total.</p> |
| <i>Contaminated Land Management Act 1979</i>             | The general object of this Act is to establish a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation under Division 2 of Part 3, and to ensure that contaminated land is managed with regard to the principles of ecologically sustainable development. | <p>Contamination on site must be assessed and managed in accordance with this act.</p> <p>Division 2, Part 3, Section 11-17 of this Act details requirements for the Management of Contaminated Land.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Water Management Act 2000</i>                         | The objects of this Act are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations.                                                                                                                                                                              | Although it is not envisaged that any construction activities would be undertaken on waterfront land, any waterfront activities that do occur would be conducted generally in accordance with the NSW Office of Water's Guidelines for Controlled Activities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <i>Fisheries Management Act 1994</i>                     | The objectives of this Act seek to conserve fishery resources, fish stocks and key fish habitats.                                                                                                                                                                                                                                                           | This SMP has been prepared to maintain existing flow regimes surrounding the site and to contain water onsite within sediment basins until discharged with strict water quality requirements. No impacts to fisheries are envisaged as a result of Project construction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Legislation                                                                         | Description                                                                                                                                                                                                                                                                                                                                                             | Relevance to the SMP                                                                                                                               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Dangerous Goods Regulation (Road and Rail Transport) 2014</i>                    | The main objects of this Regulation are to give effect to the standards, requirements and procedures of the Code so far as they apply to the transport of dangerous goods by land transport, and to promote consistency between the standards, requirements and procedures applying to the transport of dangerous goods by land transport and other modes of transport. | Provisions relating to the storage and transport of dangerous good, such as fuelling procedures and fuel storage, are incorporated into this plan. |
| <i>Commonwealth Environmental Protection and Biodiversity Conservation Act 1999</i> | The objectives of this Act seek to promote environmental protection, ecologically sustainable development, biodiversity conservation and the promotion of heritage, among others.                                                                                                                                                                                       |                                                                                                                                                    |

Additional guidelines and standards considered in relation to the management of stormwater include:

- *Campbelltown DCP Volume 2 Engineering design for Development June 2009*
- Managing Urban Stormwater – Soils and Construction Volume 1, 4th Edition (Landcom 2004);
- Managing Urban Stormwater: Harvesting and Reuse – 2006 (NSW DEC);
- Managing Urban Stormwater: Source Control – 1998 (NSW EPA);
- Managing Urban Stormwater: Treatment Techniques – 1997 (NSW EPA);
- Managing Urban Stormwater: Soils & Construction – 2004(LANDCOM);
- Water Sensitive Urban Design – “Technical Guidelines for Western Sydney” by URS Australia Pty Ltd, May 2004
- AS 3500.3 National Plumbing and Drainage Code Part 3 – Stormwater Drainage.
- “Australian Rainfall and Runoff” (2019 Edition), Volumes 1 and 2 (AR&R).

### 3.4 General SMP Requirements

1. This document is noted to form a sub-plan as part of the *CEMP* as required under **CoC C1 & C2**.
2. This document and associated drawings are subject to further periodic review throughout the works and operational period to ensure the requirements and measures set out in this SMP are fit for purpose and allow for any changes which might occur during construction not envisaged during the initial preparation of the SMP.

3. All stormwater management control measures will conform to the standards and specifications contained in:
  - (i) This SMP;
  - (ii) Conditions of Consent SSDA-7500 MOD1; and
  - (iii) the approved *CEMP* and supporting documentation.

### **3.5 Contingency Planning**

Reference to the unexpected finds protocols within the *CEMP* should be made pertaining to contingency management during construction.

### **3.6 Incident Classification and Notification**

It is the responsibility of all site personnel to report all environmental incidents to the Site Supervisor and/or the Contractor's EM during construction.

Incident response requirements including classification, responses, external notification and incident review protocol are set out in the *CEMP*. Reference to the *CEMP* should be made pertaining to all incident response protocol.

### **3.7 Environmental Auditing and Reporting**

Auditing and reporting will be undertaken in accordance with the *CEMP* during construction. Refer to the *CEMP* for details.

### **3.8 Non-compliance, Non-conformance and Actions**

It is the responsibility of all site personnel to report non-compliances and non-conformances to the Site Supervisor and/or the Contractor's EM.

Non-compliances, non-conformances and corrective and preventative actions will be managed in accordance with the *CEMP*.

### **3.9 Review and Improvement**

The effectiveness of stormwater management measures will be confirmed through regular inspections, ongoing site inspections by the Construction Contractor, engineer and the EM during construction. Adjustments as required during the construction period will be made based on confirmed site conditions and effectiveness of the implemented measures.

Review and improvement of this plan will also be undertaken in accordance with the CoC's and the *CEMP*. Continuous improvement will be achieved by the ongoing evaluation of environmental management performance and effectiveness of this plan against environmental policies, objectives and targets.

During operation, effectiveness of stormwater management measures will be confirmed through regular inspections as set out in **Appendix D**. Adjustments as required will be made based on confirmed site conditions and effectiveness of the

implemented measures. These will need to be made in conjunction with a suitably qualified engineer who specialises in stormwater and stormwater management.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure. Construction will be undertaken in accordance with the most recent, approved version of this SMP.

## 4 STORMWATER MANAGEMENT OBJECTIVES AND ADOPTED STRATEGY

### 4.1 Proposed Drainage System and Summary of Adopted Strategy

As per general engineering practice and the guidelines of CCC, the proposed stormwater drainage system for the Stage 1 & 2 development comprises a minor and major system which safely and efficiently conveys collected stormwater run-off from the development to the various legal points of discharge.

The design of the stormwater system for this site will be based on relevant national design guidelines, Australian Standard Codes of Practice, the standards of CCC and accepted engineering practice. Runoff from buildings will generally be designed in accordance with AS 3500.3 *National Plumbing and Drainage Code Part 3 – Stormwater Drainage*. Overall site runoff and stormwater management will generally be designed in accordance with the Institution of Engineers, Australia publication “*Australian Rainfall and Runoff*” (2019 Edition), Volumes 1 and 2 (AR&R).

A summary of the main stormwater management measures is provided as follows:

- In-ground drainage system designed to accommodate the 1 in 20 year ARI storm event.
- Overland flow paths to convey the 1 in 100-year ARI storm event from the proposed development site to Bow Bowing Creek or Council perimeter drainage channels.
- Vortech style gross pollutant trap located prior to discharge to Bow Bowing Creek on the west of the development site. Water quality treatment is consistent with the approved SSD 7500, as per Section 4 of the Arcadis EIS and subsequent SSD-7500 MOD1 by Costin Roe Consulting;
- Discharge of stormwater via existing outlets to either Bow Bowing Creek, or Culverston Road (refer drawings in **Appendix A**); and
- Rainwater reuse in accordance with the estate development.

Water quality and re-use are to be considered in the design to ensure that any increase in the detrimental effects of pollution are mitigated, CCC Water Quality Objectives are met and that the demand on potable water resources is reduced.

### 4.2 Management During Construction

During construction management of stormwater runoff will be made via the *Soil and Water Management Plan* (refer **Section 8 & Appendix F**) and associated ESCP's in **Appendix A**.

The management measures during construction have been prepared in accordance with the guidelines in *Managing Urban Stormwater - Soils and Construction Volume 1* (Landcom 2004).



### 4.3 Stormwater Harvesting

Stormwater harvesting refers to the collection of stormwater from the developments internal stormwater drainage system for re-use in non-potable applications. Stormwater from the stormwater drainage system can be classified as either rainwater, where the flow is from roof areas only, or stormwater where the flow is from all areas of the development.

Rainwater harvesting will be provided for this development with re-use for non-potable applications as defined by the hydraulic engineer. Refer to hydraulic engineers drawings for details pertaining to rainwater reuse.

In general terms the rainwater harvesting system will be an in-line tank for the collection and storage of rainwater. At times when the rainwater storage tank is full rainwater can pass through the tank and continue to be discharged via gravity into the stormwater drainage system. Rainwater from the storage tank will be pumped for distribution throughout the development in a dedicated non-potable water reticulation system.

Rainwater tanks are to be sized with reference to the NSW Department of Environment and Conservation document *Managing Urban Stormwater: Harvesting and Reuse*, using a simple water balance analysis to balance the supply and demand.

## 5 WATER QUANTITY MANAGEMENT

Campbelltown City Council does not require water quantity management, or stormwater detention, to be provided for site within established industrial areas with downstream conveyance systems which have sufficient capacity or where there is no change in pre and post development flows. The requirements for water quantity management are included in *Section 4.4 of Campbelltown DCP Volume 2 Engineering design for Development June 2009*.

We note the existing site is fully developed with almost whole of site comprising impervious buildings, concrete pavements or spray seal bitumen pavement surfaces. There is no change or increase in impervious areas, and as such no increase in runoff as a result of redevelopment.

The original SSD-7500 development approval, and the subsequent SSD-7500 MOD1 approval, does not require stormwater detention, or any other stormwater quantity management measures to be provided. As such, there are no proposed stormwater quantity management measures included as part of this SMP.

It is confirmed there is no impact on receiving waterways or downstream systems as a result of the development due to there being no differences in pre and post development runoff volume or peak flow rates.

## 6 STORMWATER QUALITY CONTROLS

There is a need to provide design which incorporates the principles of Water Sensitive Urban Design (WSUD) and to target pollutants that are present in the stormwater so as to minimise the adverse impact these pollutants could have on receiving waters.

The objectives for the development, as per *Section 4.1* of Arcadis *EIS Appendix 10\_Flooding and Stormwater* document are:

- Maintain or improve existing water quality
- Prevent bed and bank erosion and instability of waterways
- Incorporate a Water Sensitive Urban Design (WSUD) approach

Development lots, verges and road areas are required to be treated by the Stormwater Treatment Measures (STM's). The STM's shall be sized according to the whole catchment area. The STM's for the development shall be based on a treatment train approach to ensure that the objectives above are met and an improvement in water quality is achieved.

Components of the treatment train for the Modification Proposal remain consistent with the approved SSD 7500 Water Quality Strategy. These are as follows:

- Treatment via gross pollutant trap be provided at each discharge point. The specified GPT achieves pollutant reduction removal rates of approximately 90% of GP's, 65% of TSS, 35% of TP, 10% of TN and 60% of TH (per *Table 5* of approved SSD7500, Arcadis *EIS Appendix 10\_Flooding and Stormwater* document).  
STM's for development site are to be specified based on individual use on each development lot. Typical examples of acceptable site STM's include end-of-line gross pollutants traps (GPT's) such as Ecosol RSF4000, Rocla CDS, Humeceptor and at source methods such as pit inserts equivalent to Stormwater360 Enviropods;
- A portion of the future building roofs will also provide a level of treatment via rainwater reuse and settlement within the rainwater tank.

For the Stage 1 and 2 development the confirmed GPT arrangement is for the provision of Ocean Protect Vortechs 11000 which treats the warehouse and hardstand catchments at each discharge to Bow Bowing Creek. Refer to drawings in **Appendix A** for location and details of stormwater quality devices.

## 7 SITE INSPECTION AND MAINTENANCE

### 7.1 Site Inspection and Maintenance Introduction

It is important that each component of the water quantity measures, and water quality treatment train is properly operated and maintained. These need to be considered through the life cycle of the whole of the development. Confirmation of maintenance and monitoring regarding stormwater quality and quantity over the whole life of the development.

Auditing of the maintenance requirements for the system are to be completed by the applicant and their estate management team during operational phase.

During construction, inspection and maintenance is to be consistent and detailed within the CEMP. Regular inspections will be performed (daily and weekly per the provided check sheets) by the Construction Contractor's representative in addition to the regular site inspections of performance of controls by the ESC or engineer.

### 7.2 Water Quality Monitoring

1. All water discharge performance to be in accordance with **Section 4.1** of this SMP.
2. All water quality data, including dates of rainfall, dates of testing, testing results and dates of water release, must be kept in an on-site register. The register is to be maintained up to date for the duration of the approved works and be available on-site for inspection by environmental representative on request.
3. At nominated water monitoring sites, a minimum of 3 water samples must be taken and analysed, and the average result used to determine quality.
4. All environmentally relevant incidents must be recorded in a field log that must remain accessible to all relevant regulatory authorities.

### 7.3 Maintenance and Monitoring Plan

It is important that each component of the water quantity measures, and water quality treatment train is properly operated and maintained. These need to be considered through the life cycle of the whole of the development. Confirmation of maintenance and monitoring regarding stormwater quality and quantity over the whole life of the development. In order to confirm the maintenance and monitoring requirements of the operational aspects of the development, a *Maintenance and Monitoring Plan* has been prepared and included as **Appendix D**.

The maintenance plan and schedule included in **Appendix D** is provided for the permanent drainage systems required for the operational phase of the estate. Individual development lots will not require any additional management measures unless site specific operational requirements necessitate additional measures (e.g. firewater containment, additional treatment for operation aspects). These would be assessed on a merit based method for individual developments.

## 8 SOIL AND WATER MANAGEMENT PLAN

### 8.1 Soil and Water Management General

**Section 1** provides a summary of the construction works for the Proposal. While all construction activities have the potential to impact on water quality, the key activities are:

- Erosion and sediment control installation.
- Grading and filling of the existing site to suit building layout, drainage layout and pavements.
- Stormwater and drainage works.
- Service installation works.
- Building construction works.

Without any mitigation measures and during typical construction activities, site runoff would be expected to convey a significant sediment load. A Construction *Soil and Water Management Plan* (CSWMP) and *Erosion and Sediment Control Plan* (ESCP), or equivalent, will be implemented for the construction of the development. The CSWMP and ESCPs have been developed in accordance with the principles and requirements of *Managing Urban Stormwater – Soils & Construction Volume 1 ('Blue Book')* (Landcom, 2004).

In accordance with the principles included in the Blue Book, a number of controls have been incorporated into the ESCP (refer to accompanying Drawings in **Appendix A**) and CSWMP in **Appendix F**.

The sections below outline the proposed controls for management of erosion and sedimentation during construction of the Proposal, noting measures proposed are consistent with the SSD-7500 and SSD-7500 Mod1 approvals.

### 8.2 Discharge Criteria

The quality of discharge from the site during construction, to satisfy the Water Quality Objectives (WQOs) per Landcom Blue Book requirements, are as follows:

- Water pH released from a controlled sediment basin outflow shall be within the range 6.5 to 8.5.
- Suspended Solids released from controlled sediment basin outflows will be no greater than 50mg/L, 75 NTU's (Nephelometric Turbidity Units) or other Turbidity measurement based on confirmed laboratory correlation. Correlation should be confirmed through laboratory assessment and in consultation with the CPESC.
- Oils and Grease – no visible films or odour.
- Litter – no visible litter washed or blown from the site.

### 8.3 Typical Management Measures

#### Sediment Basins

Sediment basins have been sized (based on 5 day 85<sup>th</sup> percentile rainfall) and located to ensure sediment concentrations in site runoff are within acceptable limits. Preliminary basin sizes have been calculated in accordance with the Blue Book and are based on 'Type F' soils. These soils are fine grained and require a relatively long residence time to allow settling.

Sediment basins for 'Type F' soils are typically wet basins which are pumped out following a rainfall event when suspended solids concentrations of less than 50 mg/L have been achieved.

#### Sediment Fences

Sediment fences are located around the perimeter of the site to ensure no untreated runoff leaves the site. They have also been located around the existing drainage channels to minimise sediment migration into waterways and sediment basins.

#### Stabilised Site Access

For the proposal, stabilised site access is proposed at one location at the entry to the works area. This will limit the risk of sediment being transported onto public roads.

### 8.4 Other Management Measures

Other management measures that will be employed are expected to include:

- Minimising the extent of disturbed areas across the site at any one time.
- Progressive stabilisation of disturbed areas or previously completed earthworks to suit the proposal once trimming works are complete.
- Regular monitoring and implementation of remedial works to maintain the efficiency of all controls.

It is noted that the controls included in the CSWMP & ESCP are to be reviewed and updated as required as the staging and construction methodology is further developed for the development.

## 9 CONCLUSION

This SMP has been prepared to support a Construction Certificate Construction per requirements of CoC B10 & B11 of SSD7500 MOD1. The site is the approved industrial estate at Culverston Road, Minto, NSW.

A civil engineering and stormwater management strategy for the site has been developed which provides a best practice solution within the constraints of the existing landform and proposed development layout.

During the construction phase, stormwater will be managed in accordance with the *Construction Soil and Water Management Plan* (CSWMP) and associated *Erosion & Sediment Control Plan* will be in place to ensure the downstream drainage system and receiving waters are protected from sediment laden runoff.

During operation, a stormwater management system comprising water quality measures, will ensure that the approved stormwater Management Objectives are met and acceptable impacts (as defined and approved in the EIS) to the receiving waterways are achieved.

**APPENDIX A**  
**COSTIN ROE CONSULTING DRAWINGS**



# PROPOSED INDUSTRIAL DEVELOPMENT (STAGE 1 & 2)

## 5-9 CULVERSTON ROAD, MINTO, NSW 2566

### CIVIL DESIGN PACKAGE

DRAWING LIST

| DRAWING NO.    | DRAWING TITLE                         |
|----------------|---------------------------------------|
| C014506.01-C10 | DRAWING LIST & GENERAL NOTES          |
| C014506.01-C20 | EROSION AND SEDIMENT CONTROL PLAN     |
| C014506.01-C25 | EROSION AND SEDIMENT CONTROL DETAILS  |
| C014506.01-C30 | BULK EARTHWORKS PLAN                  |
| C014506.01-C31 | CUT/FILL PLAN                         |
| C014506.01-C35 | BULK EARTHWORKS SECTIONS - SHEET 1    |
| C014506.01-C36 | BULK EARTHWORKS SECTIONS - SHEET 2    |
| C014506.01-C40 | STORMWATER DRAINAGE KEY PLAN          |
| C014506.01-C41 | STORMWATER DRAINAGE PLAN - SHEET 1    |
| C014506.01-C42 | STORMWATER DRAINAGE PLAN - SHEET 2    |
| C014506.01-C43 | STORMWATER DRAINAGE PLAN - SHEET 3    |
| C014506.01-C45 | STORMWATER DRAINAGE DETAILS - SHEET 1 |
| C014506.01-C46 | STORMWATER DRAINAGE DETAILS - SHEET 2 |
| C014506.01-C50 | FINISHED LEVELS KEY PLAN              |
| C014506.01-C51 | FINISHED LEVELS PLAN - SHEET 1        |
| C014506.01-C52 | FINISHED LEVELS PLAN - SHEET 2        |
| C014506.01-C55 | TYPICAL SECTIONS                      |
| C014506.01-C65 | RETAINING WALL DETAILS                |

GENERAL NOTES

- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANT'S DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.
- ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE. ENGINEER'S DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS. ENGINEER'S DRAWINGS ISSUED IN ANY ELECTRONIC FORMAT MUST NOT BE USED FOR DIMENSIONAL SETOUT. REFER TO THE ARCHITECT'S DRAWINGS FOR ALL DIMENSIONAL SETOUT INFORMATION.
- DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.
- UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.
- ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH ACCEPTABLE SAFETY STANDARDS & APPROPRIATE SAFETY SIGNS SHALL BE INSTALLED AT ALL TIMES DURING THE PROGRESS OF THE JOB.

EXISTING SERVICES

- DURING THE EXECUTION OF WORKS, THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF EXISTING SERVICES. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED TO THE EXISTING SERVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE RELEVANT SERVICE AUTHORITY, AT NO COST TO THE PRINCIPAL.
- WHERE IT IS NECESSARY TO REMOVE, DIVERT OR CUT INTO ANY EXISTING SERVICE, THE CONTRACTOR SHALL GIVE AT LEAST THREE (3) DAYS NOTICE OF ITS REQUIREMENTS TO THE SUPERINTENDENT, WHO WILL ADVISE WHAT ARRANGEMENTS SHOULD BE MADE FOR THE ALTERATION OF SUCH EXISTING WORKS.
- ALL NEW AND EXHUMED SERVICES THAT CROSS EXISTING AND FUTURE ROADS/PAVEMENTS WITHIN THE SITE SHALL BE BACKFILLED WITH DGB20 MATERIAL TO SUBGRADE LEVEL AND COMPACTED TO 98% STANDARD DENSITY RATIO. SUBJECT TO PRIOR APPROVAL FROM RELEVANT AUTHORITY.
- ON COMPLETION OF SERVICES INSTALLATION, ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AREAS, GRASSED AREAS AND ROAD PAVEMENTS.
- CARE TO BE TAKEN WHEN EXCAVATING NEAR UTILITY SERVICES. NO MECHANICAL EXCAVATION TO BE UNDERTAKEN OVER SERVICES. LIAISE WITH RELEVANT AUTHORITY.
- THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION AND REMOVAL IF REQUIRED OF ALL EXISTING SERVICES IN AREAS AFFECTED BY THE WORKS WITHIN THE CONTRACT AREA AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT. ALL TO REGULATORY AUTHORITY STANDARDS AND APPROVAL.
- THE CONTRACTOR IS TO MAINTAIN EXISTING STORMWATER DRAINAGE FLOWS THROUGH THE ROADS AT ALL TIMES. MAKE DUE ALLOWANCE FOR ALL SUCH FLOWS AT ALL TIMES.
- PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL OBTAIN THE SUPERINTENDENT'S APPROVAL OF THE PROGRAM FOR THE RELOCATION/CONSTRUCTION OF TEMPORARY SERVICES.
- CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES AS REQUIRED TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
- INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE OR DAMAGE TO THE ADJACENT RESIDENCES. CONTRACTOR TO GAIN APPROVAL OF THE SUPERINTENDENT FOR TIME OF INTERRUPTION.
- THE CONTRACTOR SHALL UNDERTAKE A DIAL BEFORE YOU DIG (DBYD 1100) SERVICES SEARCH BEFORE THE COMMENCEMENT OF ANY WORKS.

ELECTRONIC INFORMATION NOTES:

- THE ISSUED DRAWINGS IN HARD COPY OR PDF FORMAT TAKE PRECEDENCE OVER ANY ELECTRONICALLY ISSUED INFORMATION, LAYOUTS OR DESIGN MODELS.
- THE CONTRACTOR'S DIRECT AMENDMENT OR MANIPULATION OF THE DATA OR INFORMATION THAT MIGHT BE CONTAINED WITHIN AN ENGINEER-SUPPLIED DIGITAL TERRAIN MODEL AND ITS SUBSEQUENT USE TO UNDERTAKE THE WORKS WILL BE SOLELY AT THE DISCRETION OF AND THE RISK OF THE CONTRACTOR.
- THE CONTRACTOR IS REQUIRED TO HIGHLIGHT ANY DISCREPANCIES BETWEEN THE DIGITAL TERRAIN MODEL AND INFORMATION PROVIDED IN THE CONTRACT AND/OR DRAWINGS AND IS REQUIRED TO SEEK CLARIFICATION FROM THE SUPERINTENDENT.
- THE ENGINEER WILL NOT BE LIABLE OR RESPONSIBLE FOR THE POSSIBLE ON-GOING NEED TO UPDATE THE DIGITAL TERRAIN MODEL, SHOULD THERE BE ANY AMENDMENTS OR CHANGES TO THE DRAWINGS OR CONTRACT INITIATED BY THE CONTRACTOR.

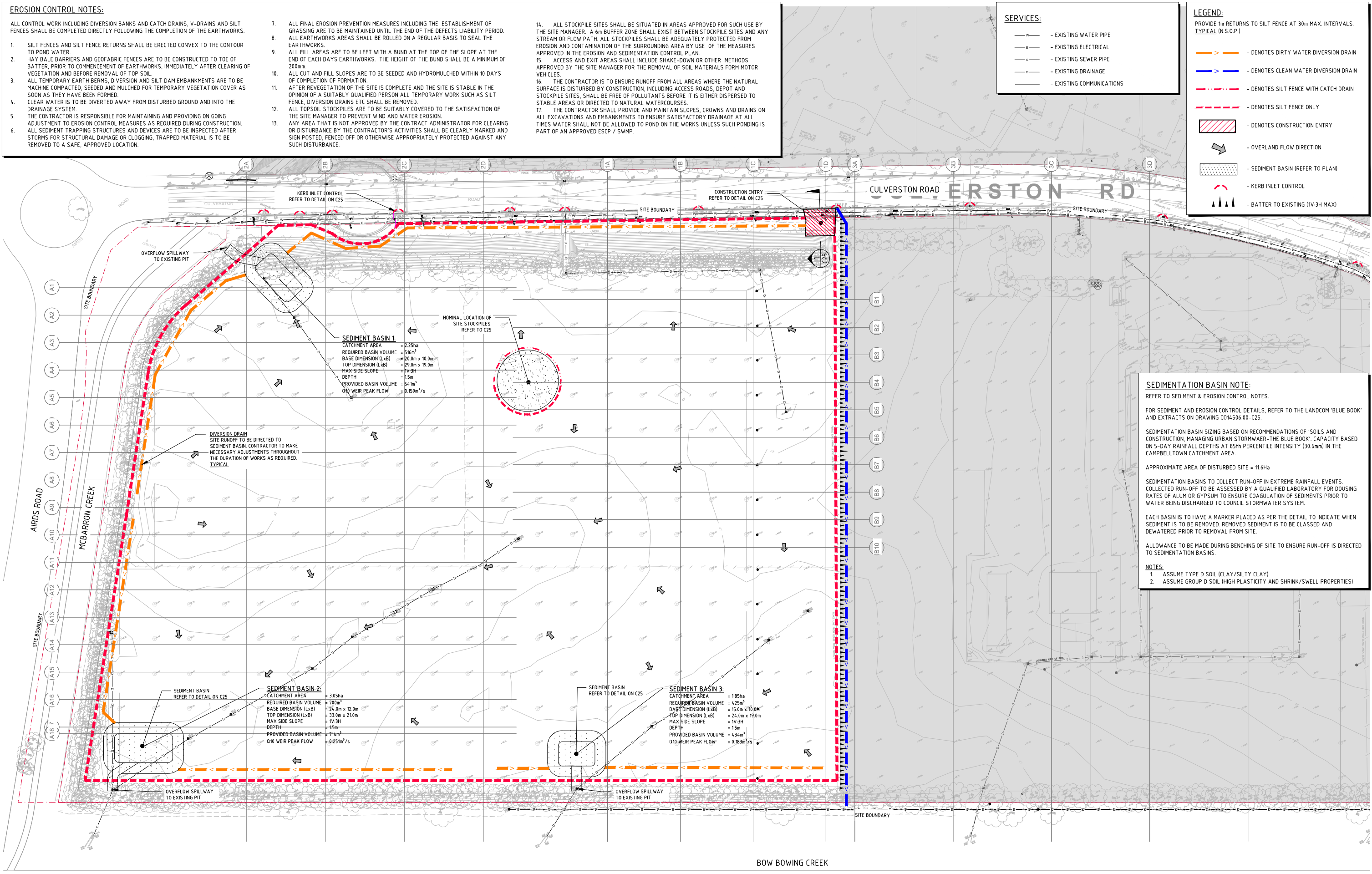


LOCALITY PLAN  
NTS

PRELIMINARY ONLY

|                  |  |  |                           |  |  |              |  |  |                                                                                       |  |  |                                                                                                                                                                                                  |  |  |                                               |  |  |
|------------------|--|--|---------------------------|--|--|--------------|--|--|---------------------------------------------------------------------------------------|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-----------------------------------------------|--|--|
| ARCHITECT        |  |  | BUILDER / PROJECT MANAGER |  |  | CLIENT       |  |  | PROJECT                                                                               |  |  | Costin Roe Consulting Pty Ltd.<br>Consulting Engineers<br>Level 1, 8 Macdonell Street<br>Wahro Bay, Sydney NSW 2000<br>Tel: (02) 8551-7888 Fax: (02) 9541-9728<br>email: mail@costinroe.com.au © |  |  | DRAWING TITLE<br>DRAWING LIST & GENERAL NOTES |  |  |
| PRELIMINARY ONLY |  |  | texco                     |  |  | Charter Hall |  |  | PROPOSED INDUSTRIAL DEV'T<br>STAGE 1 & STAGE 2<br>5-9 CULVERSTON ROAD, MINTO NSW 2566 |  |  | PRECISION   COMMUNICATION   ACCOUNTABILITY                                                                                                                                                       |  |  | DRAWING No C014506.01-C10                     |  |  |
| AMENDMENTS       |  |  | ARCHITECTS                |  |  | DATE         |  |  | DESIGNED (DRAWN) DATE                                                                 |  |  | CHECKED (REV) DATE                                                                                                                                                                               |  |  | SCALE                                         |  |  |
| 21.01.22         |  |  | B                         |  |  | JAN 22       |  |  | ML                                                                                    |  |  | ML                                                                                                                                                                                               |  |  | AS SHOWN                                      |  |  |
| A                |  |  | AMENDMENTS                |  |  | DATE         |  |  | MW                                                                                    |  |  | AD                                                                                                                                                                                               |  |  | AS SHOWN                                      |  |  |
| B                |  |  | DATE                      |  |  | ISSUE        |  |  | CHD REF: C014506.01-C10                                                               |  |  | B                                                                                                                                                                                                |  |  | B                                             |  |  |





- ### EROSION CONTROL NOTES:

ALL CONTROL WORK INCLUDING DIVERSION BANKS AND CATCH DRAINS, V-DRAINS AND SILT FENCES SHALL BE COMPLETED DIRECTLY FOLLOWING THE COMPLETION OF THE EARTHWORKS.

  - SILT FENCES AND SILT FENCE RETURNS SHALL BE ERECTED CONVEX TO THE CONTOUR TO POND WATER.
  - HAY BALE BARRIERS AND GEOTEXTILE FENCES ARE TO BE CONSTRUCTED TO TOE OF BATTER, PRIOR TO COMMENCEMENT OF EARTHWORKS, IMMEDIATELY AFTER CLEARING OF VEGETATION AND BEFORE REMOVAL OF TOP SOIL.
  - ALL TEMPORARY EARTH BERM, DIVERSION AND SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED AND MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
  - CLEAR WATER IS TO BE DIVERTED AWAY FROM DISTURBED GROUND AND INTO THE DRAINAGE SYSTEM.
  - THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND PROVIDING ON GOING ADJUSTMENT TO EROSION CONTROL MEASURES AS REQUIRED DURING CONSTRUCTION. ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING, TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE, APPROVED LOCATION.
  - ALL FINAL EROSION PREVENTION MEASURES INCLUDING THE ESTABLISHMENT OF GRASSING ARE TO BE MAINTAINED UNTIL THE END OF THE DEFECTS LIABILITY PERIOD.
  - ALL EARTHWORKS AREAS SHALL BE ROLLED ON A REGULAR BASIS TO SEAL THE EARTHWORKS.
  - ALL FILL AREAS ARE TO BE LEFT WITH A BUND AT THE TOP OF THE SLOPE AT THE END OF EACH DAYS EARTHWORKS. THE HEIGHT OF THE BUND SHALL BE A MINIMUM OF 200mm.
  - ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND HYDROMULCHED WITHIN 10 DAYS OF COMPLETION OF FORMATION.
  - AFTER REVEGETATION OF THE SITE IS COMPLETE AND THE SITE IS STABLE IN THE OPINION OF A SUITABLY QUALIFIED PERSON ALL TEMPORARY WORK SUCH AS SILT FENCE, DIVERSION DRAINS ETC SHALL BE REMOVED.
  - ALL TOPSOIL STOCKPILES ARE TO BE SUITABLY COVERED TO THE SATISFACTION OF THE SITE MANAGER TO PREVENT WIND AND WATER EROSION.
  - ANY AREA THAT IS NOT APPROVED BY THE CONTRACT ADMINISTRATOR FOR CLEARING OR DISTURBANCE BY THE CONTRACTOR'S ACTIVITIES SHALL BE CLEARLY MARKED AND SIGN POSTED, FENCED OFF OR OTHERWISE APPROPRIATELY PROTECTED AGAINST ANY SUCH DISTURBANCE.
  - ALL STOCKPILE SITES SHALL BE SITUATED IN AREAS APPROVED FOR SUCH USE BY THE SITE MANAGER. A 6m BUFFER ZONE SHALL EXIST BETWEEN STOCKPILE SITES AND ANY STREAM OR FLOW PATH. ALL STOCKPILES SHALL BE ADEQUATELY PROTECTED FROM EROSION AND CONTAMINATION OF THE SURROUNDING AREA BY USE OF THE MEASURES APPROVED IN THE EROSION AND SEDIMENTATION CONTROL PLAN.
  - ACCESS AND EXIT AREAS SHALL INCLUDE SHAKE-DOWN OR OTHER METHODS APPROVED BY THE SITE MANAGER FOR THE REMOVAL OF SOIL MATERIALS FROM MOTOR VEHICLES.
  - THE CONTRACTOR IS TO ENSURE RUNOFF FROM ALL AREAS WHERE THE NATURAL SURFACE IS DISTURBED BY CONSTRUCTION, INCLUDING ACCESS ROADS, DEPOT AND STOCKPILE SITES, SHALL BE FREE OF POLLUTANTS BEFORE IT IS EITHER DISPERSED TO STABLE AREAS OR DIRECTED TO NATURAL WATERCOURSES.
  - THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SLOPES, CROWNS AND DRAINS ON ALL EXCAVATIONS AND EMBANKMENTS TO ENSURE SATISFACTORY DRAINAGE AT ALL TIMES WATER SHALL NOT BE ALLOWED TO POND ON THE WORKS UNLESS SUCH PONDING IS PART OF AN APPROVED ESCP / SWMP.
- ### SERVICES:

  - W — - EXISTING WATER PIPE
  - E — - EXISTING ELECTRICAL
  - S — - EXISTING SEWER PIPE
  - D — - EXISTING DRAINAGE
  - C — - EXISTING COMMUNICATIONS
- ### LEGEND:

PROVIDE 1m RETURNS TO SILT FENCE AT 30m MAX. INTERVALS. TYPICAL (N.S.O.P.)

  - > — - DENOTES DIRTY WATER DIVERSION DRAIN
  - > — - DENOTES CLEAN WATER DIVERSION DRAIN
  - - - - - DENOTES SILT FENCE WITH CATCH DRAIN
  - - - - - DENOTES SILT FENCE ONLY
  - [Hatched Box] - DENOTES CONSTRUCTION ENTRY
  - [Arrow] - OVERLAND FLOW DIRECTION
  - [Dotted Box] - SEDIMENT BASIN (REFER TO PLAN)
  - [Red Arc] - KERB INLET CONTROL
  - [Triangles] - BATTER TO EXISTING (1V:3H MAX)

### SEDIMENTATION BASIN NOTE:

REFER TO SEDIMENT & EROSION CONTROL NOTES.

FOR SEDIMENT AND EROSION CONTROL DETAILS, REFER TO THE LANDCOM 'BLUE BOOK' AND EXTRACTS ON DRAWING C014506.00-C25.

SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND CONSTRUCTION, MANAGING URBAN STORMWATER-THE BLUE BOOK'. CAPACITY BASED ON 5-DAY RAINFALL DEPTHS AT 85th PERCENTILE INTENSITY (30.6mm) IN THE CAMPBELLTOWN CATCHMENT AREA.

APPROXIMATE AREA OF DISTURBED SITE = 11.6Ha

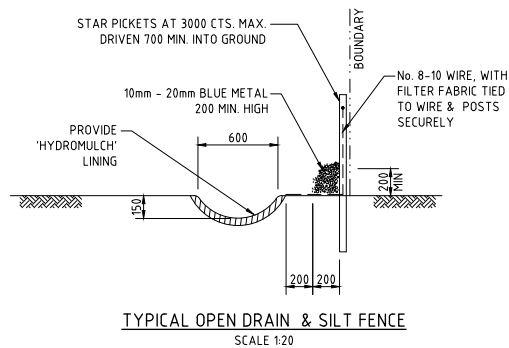
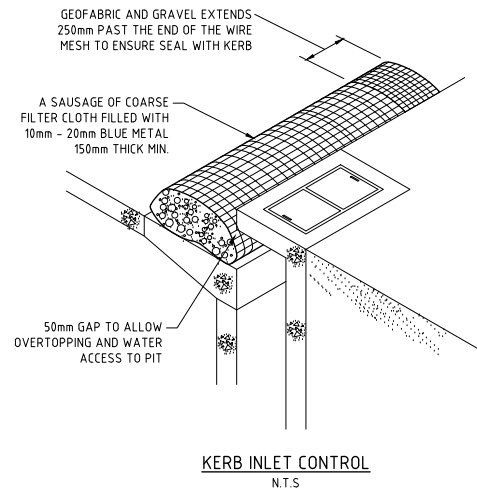
SEDIMENTATION BASINS TO COLLECT RUN-OFF IN EXTREME RAINFALL EVENTS. COLLECTED RUN-OFF TO BE ASSESSED BY A QUALIFIED LABORATORY FOR DOUSING RATES OF ALUM OR GYPSUM TO ENSURE COAGULATION OF SEDIMENTS PRIOR TO WATER BEING DISCHARGED TO COUNCIL STORMWATER SYSTEM.

EACH BASIN IS TO HAVE A MARKER PLACED AS PER THE DETAIL TO INDICATE WHEN SEDIMENT IS TO BE REMOVED. REMOVED SEDIMENT IS TO BE CLASSED AND DEWATERED PRIOR TO REMOVAL FROM SITE.

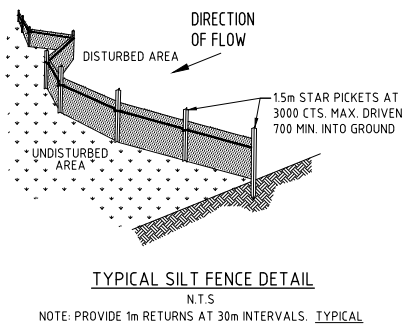
ALLOWANCE TO BE MADE DURING BENCHING OF SITE TO ENSURE RUN-OFF IS DIRECTED TO SEDIMENTATION BASINS.

NOTES:

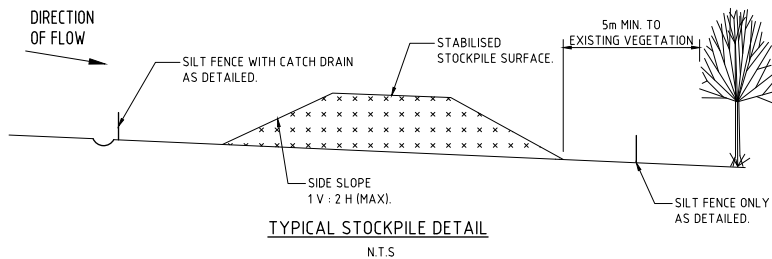
- ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
- ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES)



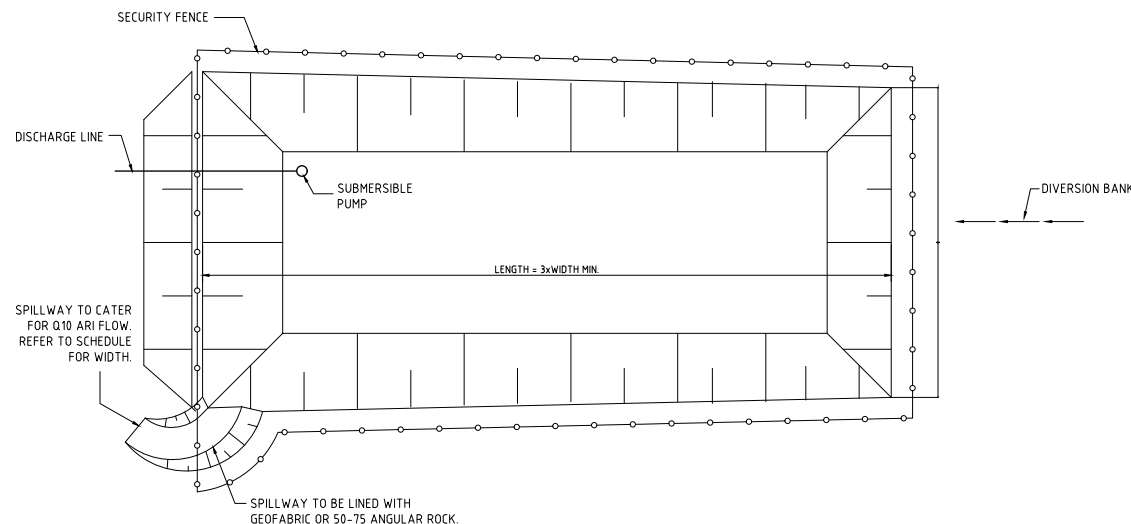
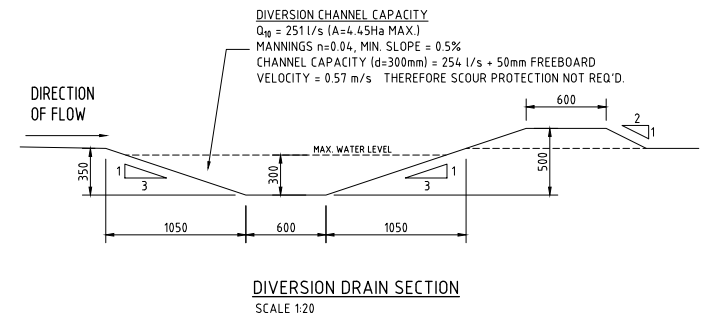
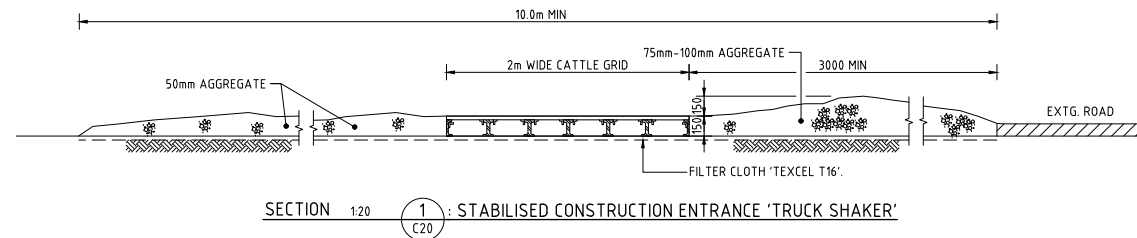
**NOTE :**  
ADOPT ABOVE DETAILS AROUND ALL PITS WITHIN AREA ENCOMPASSED BY SILT FENCE & TO PITS ON THE ROAD ADJACENT TO SITE BOUNDARY.



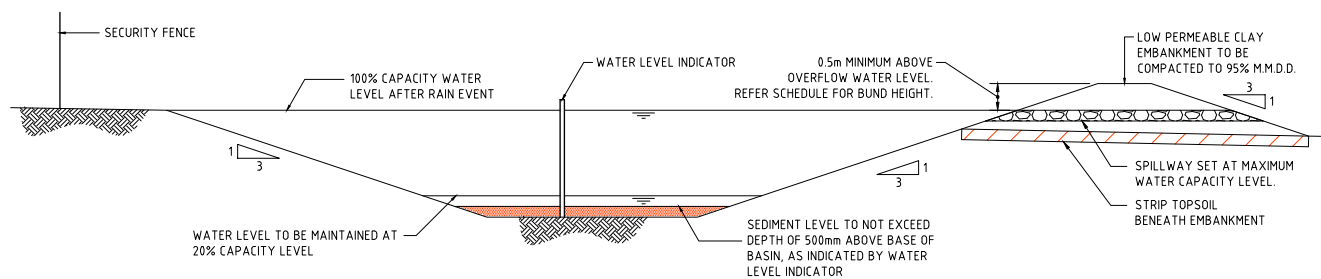
NOTE: PROVIDE 1m RETURNS AT 30m INTERVALS. TYPICAL



**STOCKPILE NOTES**  
1. PLACE ALL STOCKPILES IN LOCATIONS MORE THAN 5m FROM EXISTING VEGETATION, ROADS & HAZARD AREAS.  
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT ELONGATED MOUNDS. SIDE SLOPE TO BE 1 V : 2 H MAX.  
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.  
4. WHERE STOCKPILES ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE USING WOOD CHIP MULCH - 16 TONNE/Ha.  
5. CONSTRUCT SILT FENCE WITH CATCH DRAIN ON UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES & SILT FENCE ONLY 1 TO 2m DOWNSLOPE AS SHOWN.

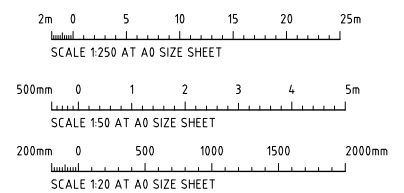
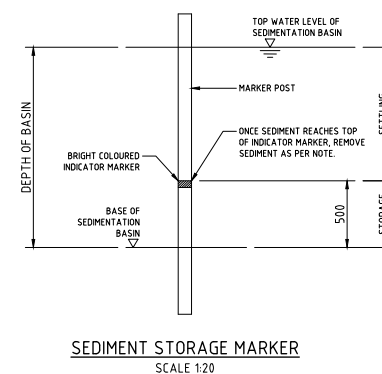


**TYPICAL SEDIMENT CONTROL POND PLAN**  
SCALE 1:250



**TYPICAL SEDIMENT CONTROL BASIN SECTION**  
SCALE 1:50

| SPILLWAY SCHEDULE |             |           |                |                |                                |
|-------------------|-------------|-----------|----------------|----------------|--------------------------------|
| CATCHMENT (Ha)    | FLOW (m³/s) | WIDTH (m) | FLOW DEPTH (m) | ROCK SIZE (mm) | BUND HEIGHT ABOVE SPILLWAY (m) |
| 1                 | 0.3         | 2         | 0.20           | 200            | 0.70                           |
| 2                 | 0.6         | 4         | 0.20           | 200            | 0.70                           |
| 5                 | 1.4         | 5         | 0.30           | 200            | 0.80                           |
| 10                | 2.8         | 8         | 0.35           | 200            | 0.85                           |



**PRELIMINARY ONLY**



# SITE PREPARATION NOTES:

- ALL EARTHWORKS SHALL BE COMPLETED UNDER LEVEL 1 SUPERVISION GENERALLY IN ACCORDANCE WITH THE GUIDELINES SPECIFIED BY THE GEOTECHNICAL ENGINEER PROVIDED BY GOLDER ASSOCIATES DATED APRIL 2016
- EXISTING LEVELS ARE BASED ON SURVEY INFORMATION PROVIDED BY CARDNO DATED 03/09/21
- STRIP ANY TOP SOIL OR DELETERIOUS MATERIAL AND DISPOSE OF FROM SITE OR STORE AS DIRECTED.
- COMPLETE CUT TO FILL EARTHWORKS TO ACHIEVE THE REQUIRED LEVELS AS INDICATED ON THE DRAWINGS WITHIN A TOLERANCE OF +0mm/-10mm THROUGH BUILDING PADS/PAVEMENTS AND +0mm/-20mm ELSEWHERE.
- PREPARE STEEP BATTERS TO RECEIVE FILL BY CONSTRUCTING BENCHING TO FACILITATE FILL PLACEMENT AND COMPACTION.
- AREAS TO RECEIVE FILL (THAT ARE NOT ON BENCHED BATTERS) AND AREAS IN CUT SHALL BE PROOF ROLLED TO IDENTIFY ANY SOFT HEAVING MATERIAL. SOFT MATERIAL SHALL BE BOXED OUT AND REMOVED PRIOR TO FILL PLACEMENT. PROOF ROLLING TO BE INSPECTED BY A GEOTECHNICAL ENGINEER OR THE EARTHWORKS DESIGNER.

- SITE WON FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HLF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HLF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
- IMPORTED FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HLF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HLF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
- ALL ENGINEERED FILL PARTICLES SHALL BE ABLE TO BE INCORPORATED WITHIN A SINGLE LAYER. FURTHER, LESS THAN 30% OF PARTICLES SHALL BE RETAINED ON THE 37.5 mm SIEVE. ENGINEERED FILL SHALL BE ABLE TO BE TESTED IN ACCORDANCE WITH THE STANDARD COMPACTION METHOD (AS1289.5.4.1) OR HLF TEST METHOD (AS1289.5.7.1). THESE METHODS REQUIRE LESS THAN 20% RETAINED ON THE 37.5 mm SIEVE. WHERE BETWEEN 20% AND 30% OF PARTICLES ARE RETAINED ON THE 37.5 mm SIEVE THE ABOVE TEST METHODS SHALL STILL BE ADOPTED AND TEST REPORTS ANNOTATED APPROPRIATELY. THESE REQUIREMENTS SHOULD BE MET BY THE MATERIAL AFTER PLACEMENT AND COMPACTION.
- PRIOR TO ANY EARTHWORKS, EROSION CONTROL AS OUTLINED IN THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE COMPLETED.

- EXISTING ROCK, IF ANY, SHALL BE REMOVED BY HEAVY ROCK BREAKING OR RIPPING.
- MATCH EXISTING LEVELS AT BATTER INTERFACE
- CONTRACTOR TO MATCH EXISTING LEVELS AT THE INTERFACE OF EARTHWORKS AND EXISTING SURFACE AT BATTER LOCATIONS OR WHERE NO RETAINING WALLS ARE PRESENT. ANY DISCREPANCY BETWEEN DESIGN AND EXISTING LEVELS TO BE REFERRED TO THE ENGINEER FOR DIRECTION OR ADJUSTMENTS TO DESIGN LEVELS.
- DURING EARTHWORKS THE CONTRACTOR IS TO ENSURE ALL AREAS ARE FREE DRAINING & WILL NOT RETAIN WATER DURING RAINFALL. PROVIDE TEMPORARY MEASURES AS REQUIRED TO ENSURE FREE FLOWING RUNOFF THROUGH MANAGED DRAINAGE PATHS, DIVERSION DRAINS OR OTHER SUITABLE DISPOSAL METHOD AS AGREED DURING THE WORKS. REFER ANY CONCERNS TO THE ENGINEER. REFER TO EROSION AND SEDIMENT CONTROL DRAWINGS AND NOTES.

## EARTHWORKS VOLUME ESTIMATE

WORKS AREA = 6.8 Ha

|                                               |                                            |
|-----------------------------------------------|--------------------------------------------|
| CUT                                           | = -4,000m <sup>3</sup>                     |
| FILL                                          | = +46,800m <sup>3</sup>                    |
| DETAILED EXCAVATION (1,200m <sup>3</sup> /Ha) | = -8,200m <sup>3</sup> (TBC BY CONTRACTOR) |
| BALANCE                                       | = +34,600m <sup>3</sup> (i.e. IMPORT)      |

NOTE:  
EARTHWORK VOLUMES ARE APPROXIMATE ONLY.

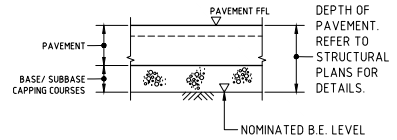
NO ALLOWANCE HAS BEEN MADE FOR DELETERIOUS MATERIAL, EROSION AND SEDIMENT CONTROL, BULKING OR COMPACTION OF FILLED SOILS.

THE EXISTING SURFACE IS BASED ON THE SURVEY INFORMATION PROVIDED BY CARDNO DATED 03/09/21. THIS SURFACE USED IS THE MOST CURRENT AVAILABLE INFORMATION HOWEVER IT MAY NOT ACCURATELY REFLECT ACTUAL GROUND LEVELS OR STOCKPILES ETC ON SITE. IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM VOLUMES AND ALLOWANCES FOR EARTHWORKS.

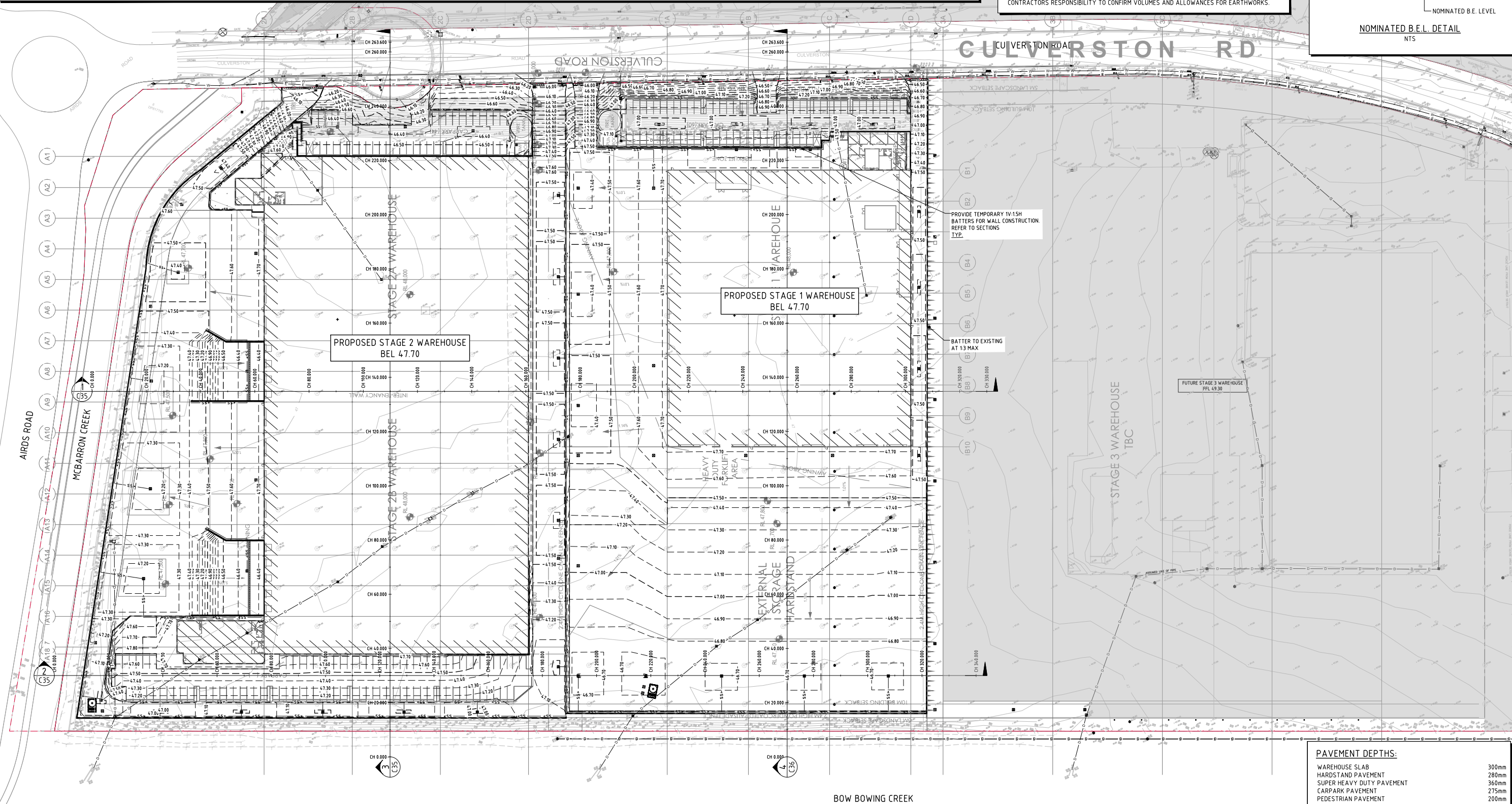
## LEGEND:

LEVELS DATUM IS AHD.

- 48.00 — - EXISTING CONTOUR
- 48.00 — - B.E.L. CONTOUR (MAJOR 0.5m)
- 48.10 — - B.E.L. CONTOUR (MINOR 0.1m)
- ▲ 48.00 — - B.E.L. SPOT LEVEL



NOMINATED B.E.L. DETAIL  
NTS



BULK EARTHWORKS PLAN  
SCALE 1:500

PRELIMINARY ONLY

## PAVEMENT DEPTHS:

|                           |       |
|---------------------------|-------|
| WAREHOUSE SLAB            | 300mm |
| HARDSTAND PAVEMENT        | 280mm |
| SUPER HEAVY DUTY PAVEMENT | 360mm |
| CARPARK PAVEMENT          | 275mm |
| PEDESTRIAN PAVEMENT       | 200mm |
| LANDSCAPED AREAS          | 100mm |
| SPRINKLER TANK SLAB       | 300mm |

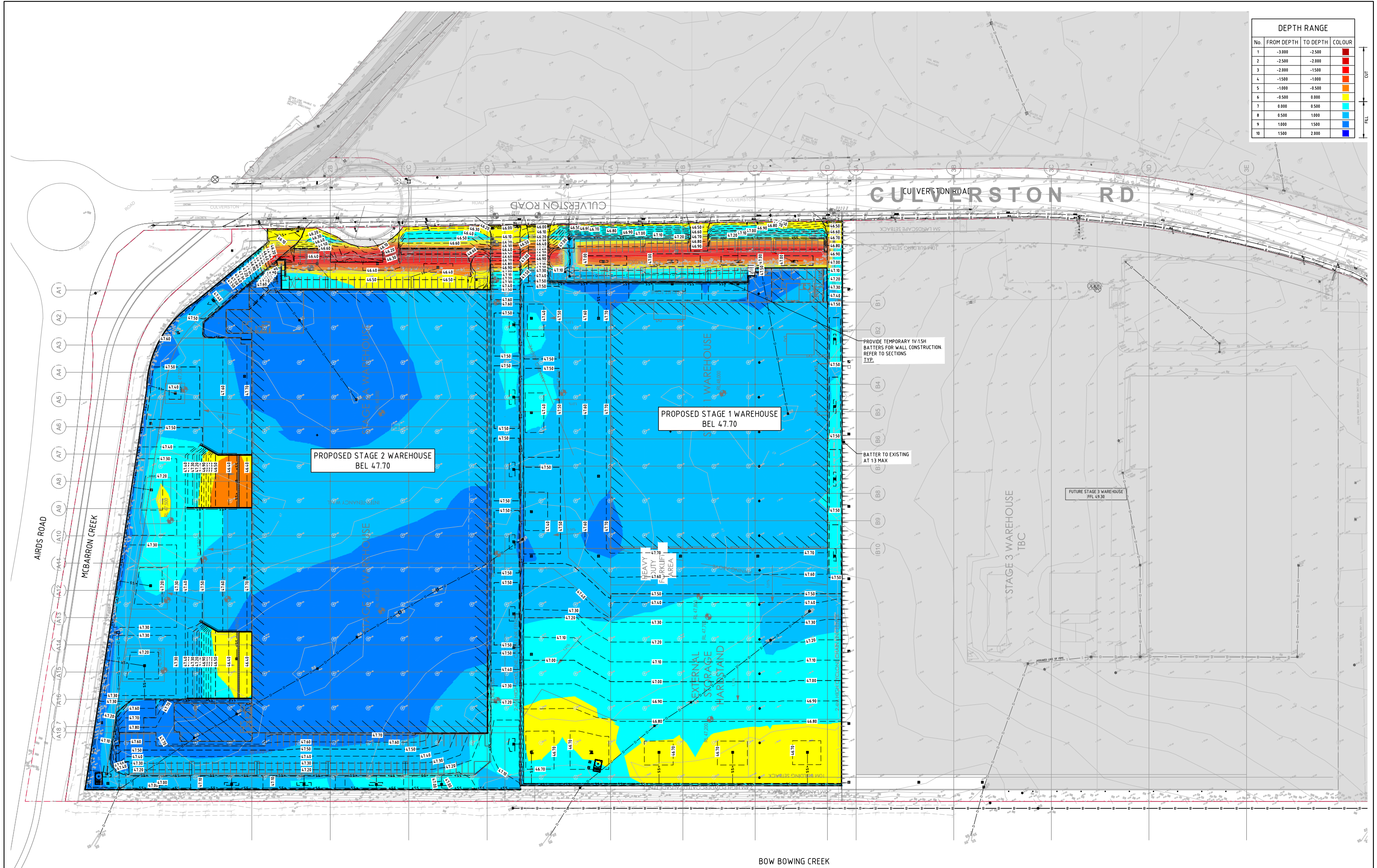
NOTE: PAVEMENT DEPTHS ARE TO BE CONFIRMED BY STRUCTURAL ENGINEER.

5m 0 10 20 30 40 50m  
SCALE 1:500 AT A0 SIZE SHEET

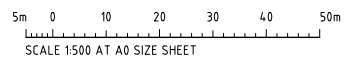
|                                                       |  |  |                                                  |  |  |           |  |  |                                                                                       |  |  |                           |  |  |                                                                                       |  |  |        |  |  |                                                                                       |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |                                                       |  |  |                                  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|                                                       |  |  |                                                  |  |  | ARCHITECT |  |  |  |  |  | BUILDER / PROJECT MANAGER |  |  |  |  |  | CLIENT |  |  |  |  |  | <div>PROJECT</div> <div>PROPOSED INDUSTRIAL DEV'T<br/>STAGE 1 &amp; STAGE 2<br/>5-9 CULVERSTON ROAD, MINTO NSW 2566</div> <div></div> <div>Costin Roe Consulting Pty Ltd.<br/>Consulting Engineers<br/>Level 1, 8 Windmill Street<br/>Wahbah Bay, Sydney NSW 2000<br/>Tel: (02) 8551-7899 Fax: (02) 9541-3728<br/>email: mail@costinroe.com.au ©</div> |  |  | <div><div>Costin Roe</div><div>Consulting</div></div> |  |  | <div>DRAWING TITLE</div> <div>BULK EARTHWORKS PLAN</div> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  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| <div>PRECISION   COMMUNICATION   ACCOUNTABILITY</div> |  |  | <div>DRAWING No.</div> <div>C014506.01-C30</div> |  |  |           |  |  |                                                                                       |  |  |                           |  |  |                                                                                       |  |  |        |  |  |                                                                                       |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |                                                       |  |  |                                  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| DEPTH RANGE |            |          |            |
|-------------|------------|----------|------------|
| No.         | FROM DEPTH | TO DEPTH | COLOUR     |
| 1           | -3.000     | -2.500   | Red        |
| 2           | -2.500     | -2.000   | Red        |
| 3           | -2.000     | -1.500   | Red        |
| 4           | -1.500     | -1.000   | Red        |
| 5           | -1.000     | -0.500   | Orange     |
| 6           | -0.500     | 0.000    | Yellow     |
| 7           | 0.000      | 0.500    | Light Blue |
| 8           | 0.500      | 1.000    | Light Blue |
| 9           | 1.000      | 1.500    | Blue       |
| 10          | 1.500      | 2.000    | Blue       |



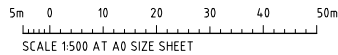
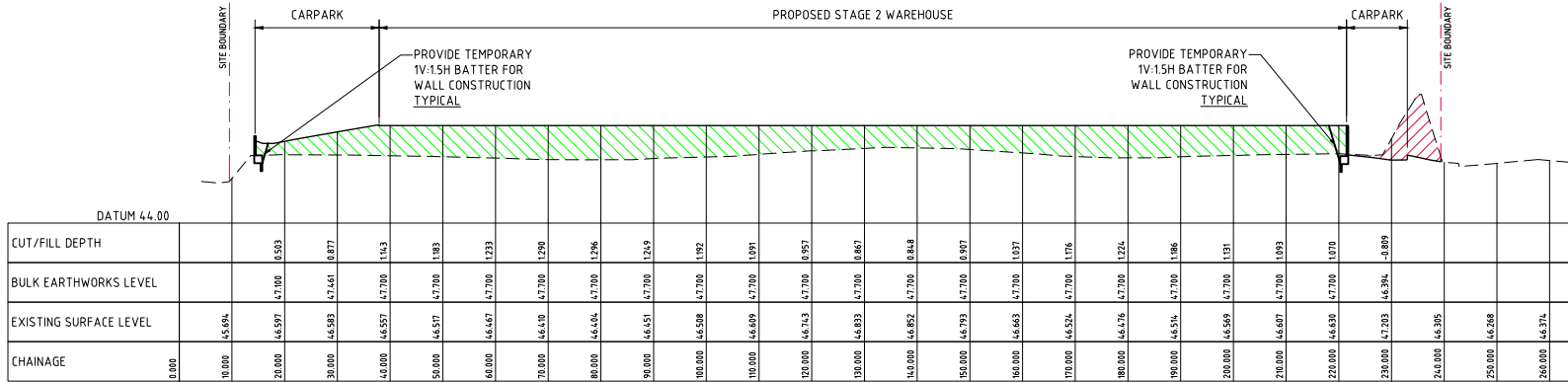
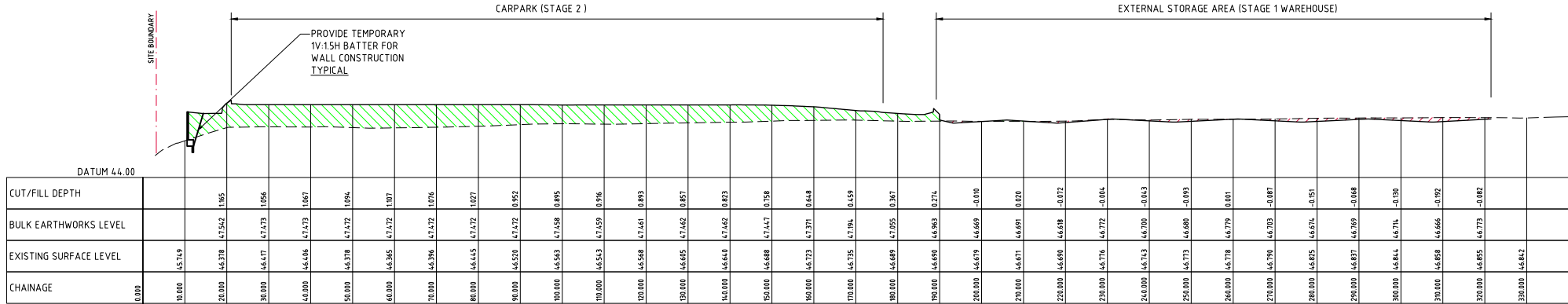
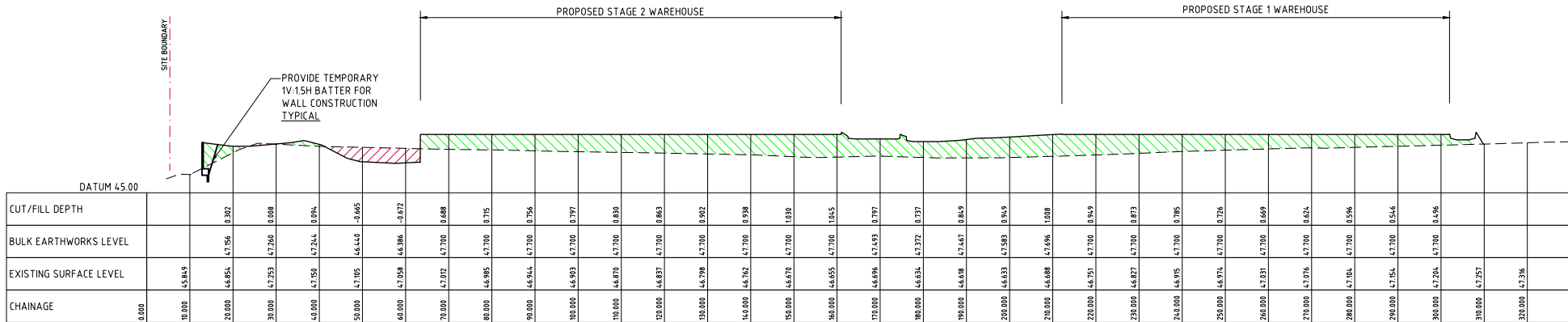
CUT/FILL PLAN  
SCALE 1:500



PRELIMINARY ONLY

|                                                   |                                                                   |                                                                   |                                                              |                                                  |                                                                                                                                         |                                                                                                                                                                                                                                                 |                                                   |                                                  |                                                       |                               |
|---------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------|-------------------------------------------------------|-------------------------------|
| <div>PRELIMINARY ONLY</div> <div>AMENDMENTS</div> | <div>06.02.22</div> <div>DATE</div> <div>A</div> <div>ISSUE</div> | <div>ARCHITECT</div> <div><b>PACE</b></div> <div>ARCHITECTS</div> | <div>BUILDER / PROJECT MANAGER</div> <div><b>texco</b></div> | <div>CLIENT</div> <div><b>Charter Hall</b></div> | <div>PROJECT</div> <div>PROPOSED INDUSTRIAL DEV'T</div> <div>STAGE 1 &amp; STAGE 2</div> <div>5-9 CULVERSTON ROAD, MINTO NSW 2566</div> | <div>CONSULTING ENGINEERS</div> <div><b>Costin Roe Consulting</b></div> <div>Level 1, 8 Windmill Street</div> <div>Wahbah Bay, Sydney NSW 2000</div> <div>Tel: (02) 8551-7899 Fax: (02) 9541-3721</div> <div>email: mail@costinroe.com.au</div> | <div>DRAWING TITLE</div> <div>CUT/FILL PLAN</div> | <div>DRAWING No.</div> <div>C014506.01-C31</div> | <div>PRECISION   COMMUNICATION   ACCOUNTABILITY</div> | <div>TRUCK</div> <div>A</div> |
|---------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------|-------------------------------------------------------|-------------------------------|

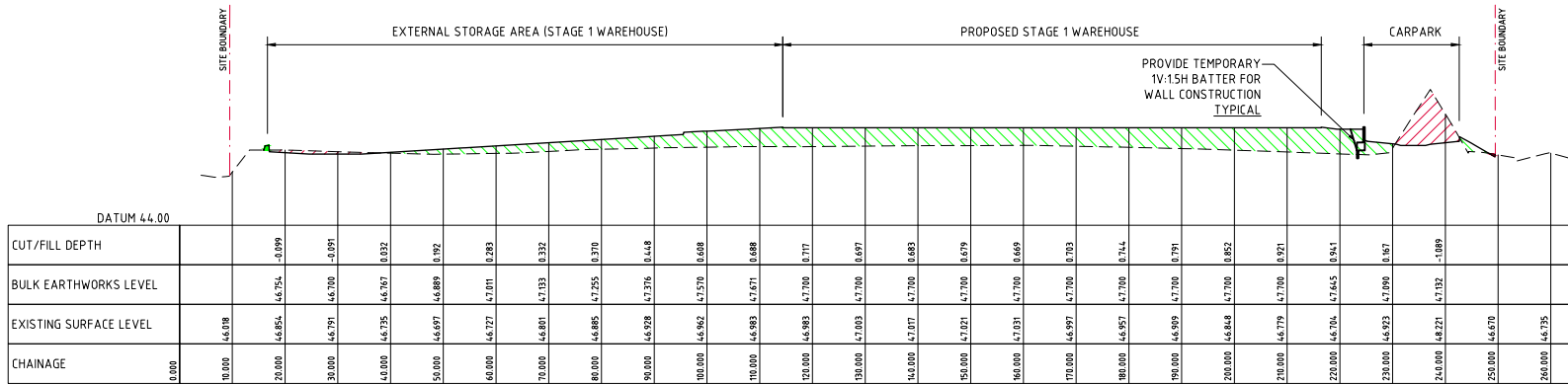
- LEGEND:
- DENOTES BULK EARTHWORKS PROFILE
  - DENOTES EXISTING PROFILE
  - DENOTES AREA IN CUT
  - DENOTES AREA IN FILL



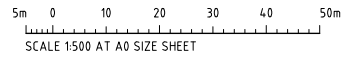
PRELIMINARY ONLY

LEGEND:

- DENOTES BULK EARTHWORKS PROFILE
- DENOTES EXISTING PROFILE
- DENOTES AREA IN CUT
- DENOTES AREA IN FILL



SECTION 4  
HORIZONTAL SCALE 1:500  
VERTICAL SCALE 1:100



PRELIMINARY ONLY



## STORMWATER DRAINAGE NOTES:

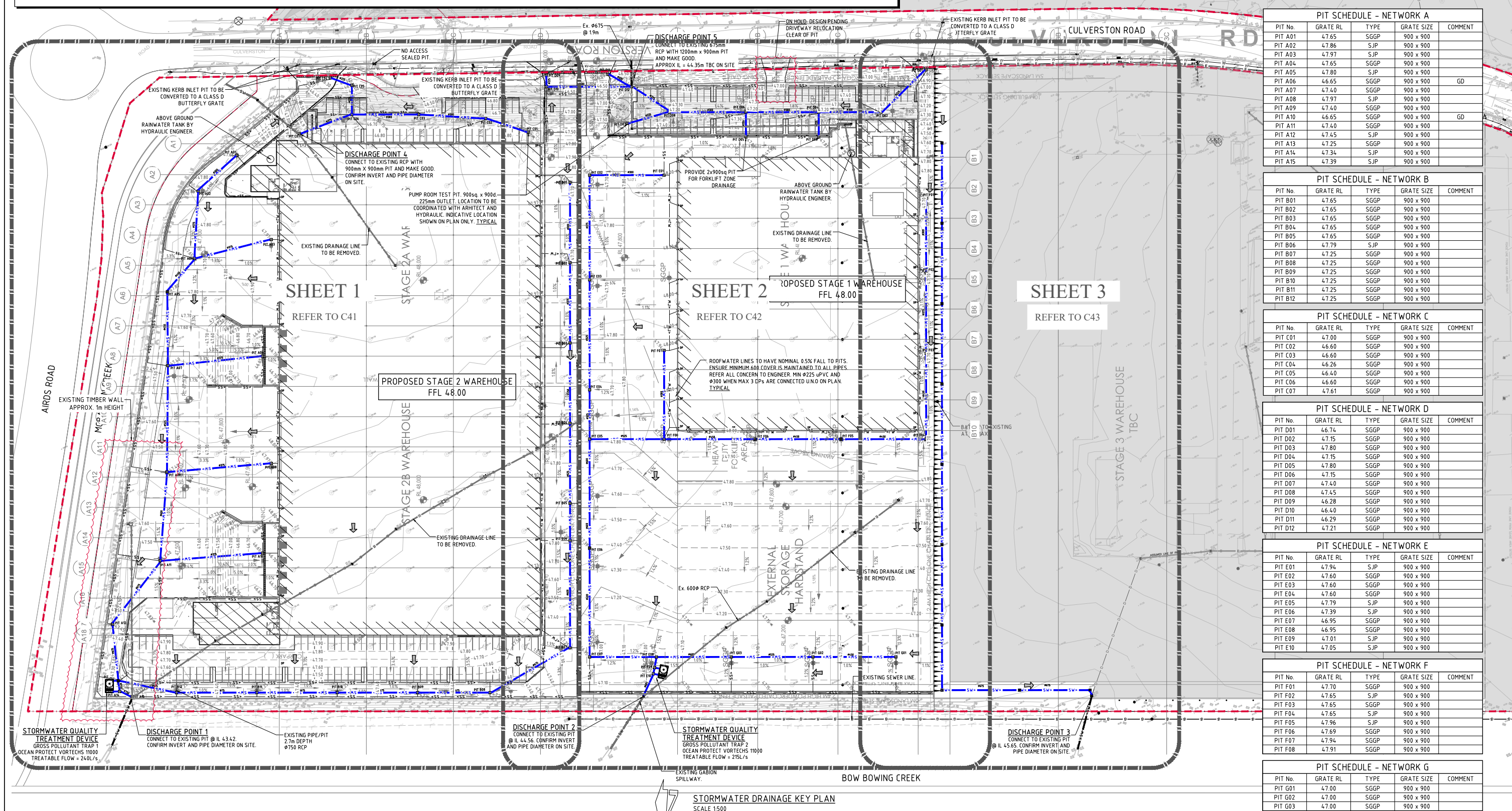
- ALL STORMWATER WORKS TO BE COMPLETED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS3500.3:2018 PLUMBING AND DRAINAGE, PART 3: STORMWATER DRAINAGE. THE MINOR (PIPED) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 20 YEAR ARI STORM EVENT AND THE MAJOR (OVERLAND) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 100 YEAR ARI STORM EVENT.
- ALL FINISHED PAVEMENT LEVELS SHALL BE AS INDICATED ON FINISHED LEVELS PLANS C014506.01-C50.
- PIT SIZES SHALL BE AS INDICATED IN THE SCHEDULE WHILE PIPE SIZES AND DETAILS ARE PROVIDED ON PLAN.
- EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED BY SURVEY PRIOR TO COMMENCING WORKS ON SITE.
- ALL STORMWATER PIPES Ø375 OR GREATER SHALL BE CLASS 2 (WITH HS2 SUPPORT) REINFORCED CONCRETE WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.
- ALL PIPES UP TO AND INCLUDING Ø300 TO BE UPVC GRADE SN8 UNDO.
- PIPE CLASS NOMINATED ARE FOR IN-SERVICE LOADING CONDITIONS ONLY. CONTRACTOR IS TO MAKE ANY NECESSARY ADJUSTMENTS REQUIRED FOR CONSTRUCTION CONDITIONS.
- ALL CONCRETE PITS GREATER THAN 1000mm DEEP SHALL BE REINFORCED USING N12-200 EACH WAY CENTERED IN WALL AND BASE. LAP MINIMUM 300mm WHERE REQUIRED. ALL CONCRETE FOR PITS SHALL BE F<sub>ck</sub>=25 MPa. PRECAST PITS MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
- IN ADDITION TO ITEM 6 ABOVE, ALL CONCRETE PITS GREATER THAN 3000mm DEEP SHALL HAVE WALLS AND BASE THICKNESS INCREASED TO 200mm.
- PIPES SHALL BE LAID AS PER PIPE LAYING DETAILS. PARTICULAR CARE SHALL BE TAKEN TO ENSURE THAT THE PIPE IS FULLY AND EVENLY SUPPORTED. RAM AND PACK FILLING AROUND AND UNDER BACK OF PIPES AND PIPE FAUCETS, WITH NARROW EDGED RAMMERS OR OTHER SUITABLE TAMPING DETAILS.
- CONCRETE PIPES UNDER, OR WITHIN THE ZONE OF INFLUENCE OF PAVED AREAS SHALL BE LAID USING HS2 TYPE SUPPORT, AS A MINIMUM, IN ACCORDANCE WITH AS 3725. AGGREGATE BACKFILL SHALL NOT BE USED FOR PIPE BEDDING AND OR HAUNCH/SIDE SUPPORT.
- WHERE PIPE LINES ENTER PITS, PROVIDE 2m LENGTH OF STOCKING WRAPPED SLOTTED Ø100 UPVC TO EACH SIDE OF PIPE.
- ALL SUBSOIL DRAINAGE LINES SHALL BE Ø100 SLOTTED UPVC WITH APPROVED FILTER WRAP LAID IN 300mm WIDE GRANULAR FILTER UNLESS NOTED OTHERWISE. LAY SUBSOIL LINES TO MATCH FALLS OF LAND AND/OR 1 IN 200 MINIMUM. PROVIDE CAPPED CLEANING EYE (RODDING POINT) AT UPSTREAM END OF LINE AND AT 30m MAX. CTS. PROVIDE SUBSOIL LINES TO ALL PAVEMENT/ LANDSCAPED INTERFACES, TO REAR OF RETAINING WALLS (AS NOMINATED BY STRUCTURAL ENGINEER) AND AS SHOWN ON PLAN.
- ALL PIPE GRADES 1 IN 200 MINIMUM UNDO.
- PROVIDE STEP IRONS IN PITS DEEPER THAN 1000mm.
- MIN. 600 COVER TO PIPE OBVERT BENEATH ROADS & MIN. 400 COVER BENEATH LANDSCAPED AND PEDESTRIAN AREAS.
- PIT COVERS IN TRAFFICABLE PAVEMENT SHALL BE CLASS D 'HEAVY DUTY'; THOSE LOCATED IN NON-TRAFFICABLE AREAS SHALL BE CLASS B 'MEDIUM DUTY' UNDO. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
- DOWN PIPES (DP) TO BE AS PER HYDRAULIC ENGINEERS DETAILS WITH CONNECTOR TO MATCH DP SIZE UNDO. ON PLAN, PROVIDE CLEANING EYE AT GROUND LEVEL.
- PIPE LENGTHS NOMINATED ON PLAN OR LONGSECTIONS ARE MEASURED FROM CENTER OF PITS TO THE NEAREST 0.5m AND DO NOT REPRESENT ACTUAL LENGTH. THE CONTRACTOR IS TO ALLOW FOR THIS.
- WHERE CONNECTION TO EXISTING INGROUND DRAINAGE SYSTEMS, OPEN SWALES, CHANNELS OR ANY OTHER EXISTING SYSTEM, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION AND INVERT ON SITE AT THE BEGINNING OF THE CONSTRUCTION PERIOD. REFER ANY VARIANCE FROM DOCUMENTATION OR SURVEYS TO THE ENGINEER FOR CLARIFICATION.

## STORMWATER PIT NOTE:

PIT GRATES CLASS:  
CARPARKING - CLASS D  
BUNNINGS HARDSTAND - CLASS E  
SPEC HARDSTAND - CLASS D  
FIRE TRAIL / TRUCK ACCESS - CLASS D  
LANDSCAPE AREAS - CLASS B

## LEGEND:

- EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY CARDNO DATED 03/09/21.
- |  |                                         |  |                                                    |
|--|-----------------------------------------|--|----------------------------------------------------|
|  | - SGGP, SINGLE GRATED GULLY PIT         |  | - ROOFWATER DOWNPIPE (INDICATIVE)                  |
|  | - SJP, SEALED JUNCTION PIT              |  | - ROOFWATER LINE                                   |
|  | - GD, GRATED DRAIN (300W x 225D UNDO)   |  | - SUBSOIL LINE                                     |
|  | - PROPOSED DRAINAGE LINE                |  | - OVERLAND FLOW DIRECTION                          |
|  | - EXISTING DRAINAGE LINE TO BE REMOVED  |  | - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS |
|  | - EXISTING DRAINAGE LINE TO BE RETAINED |  | - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS |
|  | - SITE BOUNDARY                         |  |                                                    |



| PIT SCHEDULE - NETWORK A |          |      |            |         |
|--------------------------|----------|------|------------|---------|
| PIT No.                  | GRATE RL | TYPE | GRATE SIZE | COMMENT |
| PIT A01                  | 47.65    | SGGP | 900 x 900  |         |
| PIT A02                  | 47.86    | SJP  | 900 x 900  |         |
| PIT A03                  | 47.97    | SJP  | 900 x 900  |         |
| PIT A04                  | 47.65    | SGGP | 900 x 900  |         |
| PIT A05                  | 47.80    | SJP  | 900 x 900  |         |
| PIT A06                  | 46.65    | SGGP | 900 x 900  | GD      |
| PIT A07                  | 47.40    | SGGP | 900 x 900  |         |
| PIT A08                  | 47.97    | SJP  | 900 x 900  |         |
| PIT A09                  | 47.40    | SGGP | 900 x 900  |         |
| PIT A10                  | 46.65    | SGGP | 900 x 900  | GD      |
| PIT A11                  | 47.40    | SGGP | 900 x 900  |         |
| PIT A12                  | 47.45    | SJP  | 900 x 900  |         |
| PIT A13                  | 47.25    | SGGP | 900 x 900  |         |
| PIT A14                  | 47.34    | SJP  | 900 x 900  |         |
| PIT A15                  | 47.39    | SJP  | 900 x 900  |         |

| PIT SCHEDULE - NETWORK B |          |      |            |         |
|--------------------------|----------|------|------------|---------|
| PIT No.                  | GRATE RL | TYPE | GRATE SIZE | COMMENT |
| PIT B01                  | 47.65    | SGGP | 900 x 900  |         |
| PIT B02                  | 47.65    | SGGP | 900 x 900  |         |
| PIT B03                  | 47.65    | SGGP | 900 x 900  |         |
| PIT B04                  | 47.65    | SGGP | 900 x 900  |         |
| PIT B05                  | 47.65    | SGGP | 900 x 900  |         |
| PIT B06                  | 47.79    | SJP  | 900 x 900  |         |
| PIT B07                  | 47.25    | SGGP | 900 x 900  |         |
| PIT B08                  | 47.25    | SGGP | 900 x 900  |         |
| PIT B09                  | 47.25    | SGGP | 900 x 900  |         |
| PIT B10                  | 47.25    | SGGP | 900 x 900  |         |
| PIT B11                  | 47.25    | SGGP | 900 x 900  |         |
| PIT B12                  | 47.25    | SGGP | 900 x 900  |         |

| PIT SCHEDULE - NETWORK C |          |      |            |         |
|--------------------------|----------|------|------------|---------|
| PIT No.                  | GRATE RL | TYPE | GRATE SIZE | COMMENT |
| PIT C01                  | 47.00    | SGGP | 900 x 900  |         |
| PIT C02                  | 46.60    | SGGP | 900 x 900  |         |
| PIT C03                  | 46.60    | SGGP | 900 x 900  |         |
| PIT C04                  | 46.26    | SGGP | 900 x 900  |         |
| PIT C05                  | 46.40    | SGGP | 900 x 900  |         |
| PIT C06                  | 46.60    | SGGP | 900 x 900  |         |
| PIT C07                  | 47.61    | SGGP | 900 x 900  |         |

| PIT SCHEDULE - NETWORK D |          |      |            |         |
|--------------------------|----------|------|------------|---------|
| PIT No.                  | GRATE RL | TYPE | GRATE SIZE | COMMENT |
| PIT D01                  | 46.74    | SGGP | 900 x 900  |         |
| PIT D02                  | 47.15    | SGGP | 900 x 900  |         |
| PIT D03                  | 47.80    | SGGP | 900 x 900  |         |
| PIT D04                  | 47.15    | SGGP | 900 x 900  |         |
| PIT D05                  | 47.80    | SGGP | 900 x 900  |         |
| PIT D06                  | 47.15    | SGGP | 900 x 900  |         |
| PIT D07                  | 47.40    | SGGP | 900 x 900  |         |
| PIT D08                  | 47.45    | SGGP | 900 x 900  |         |
| PIT D09                  | 46.28    | SGGP | 900 x 900  |         |
| PIT D10                  | 46.40    | SGGP | 900 x 900  |         |
| PIT D11                  | 46.29    | SGGP | 900 x 900  |         |
| PIT D12                  | 47.21    | SGGP | 900 x 900  |         |

| PIT SCHEDULE - NETWORK E |          |      |            |         |
|--------------------------|----------|------|------------|---------|
| PIT No.                  | GRATE RL | TYPE | GRATE SIZE | COMMENT |
| PIT E01                  | 47.94    | SJP  | 900 x 900  |         |
| PIT E02                  | 47.60    | SGGP | 900 x 900  |         |
| PIT E03                  | 47.60    | SGGP | 900 x 900  |         |
| PIT E04                  | 47.60    | SGGP | 900 x 900  |         |
| PIT E05                  | 47.79    | SJP  | 900 x 900  |         |
| PIT E06                  | 47.39    | SJP  | 900 x 900  |         |
| PIT E07                  | 46.95    | SGGP | 900 x 900  |         |
| PIT E08                  | 46.95    | SGGP | 900 x 900  |         |
| PIT E09                  | 47.01    | SJP  | 900 x 900  |         |
| PIT E10                  | 47.05    | SJP  | 900 x 900  |         |

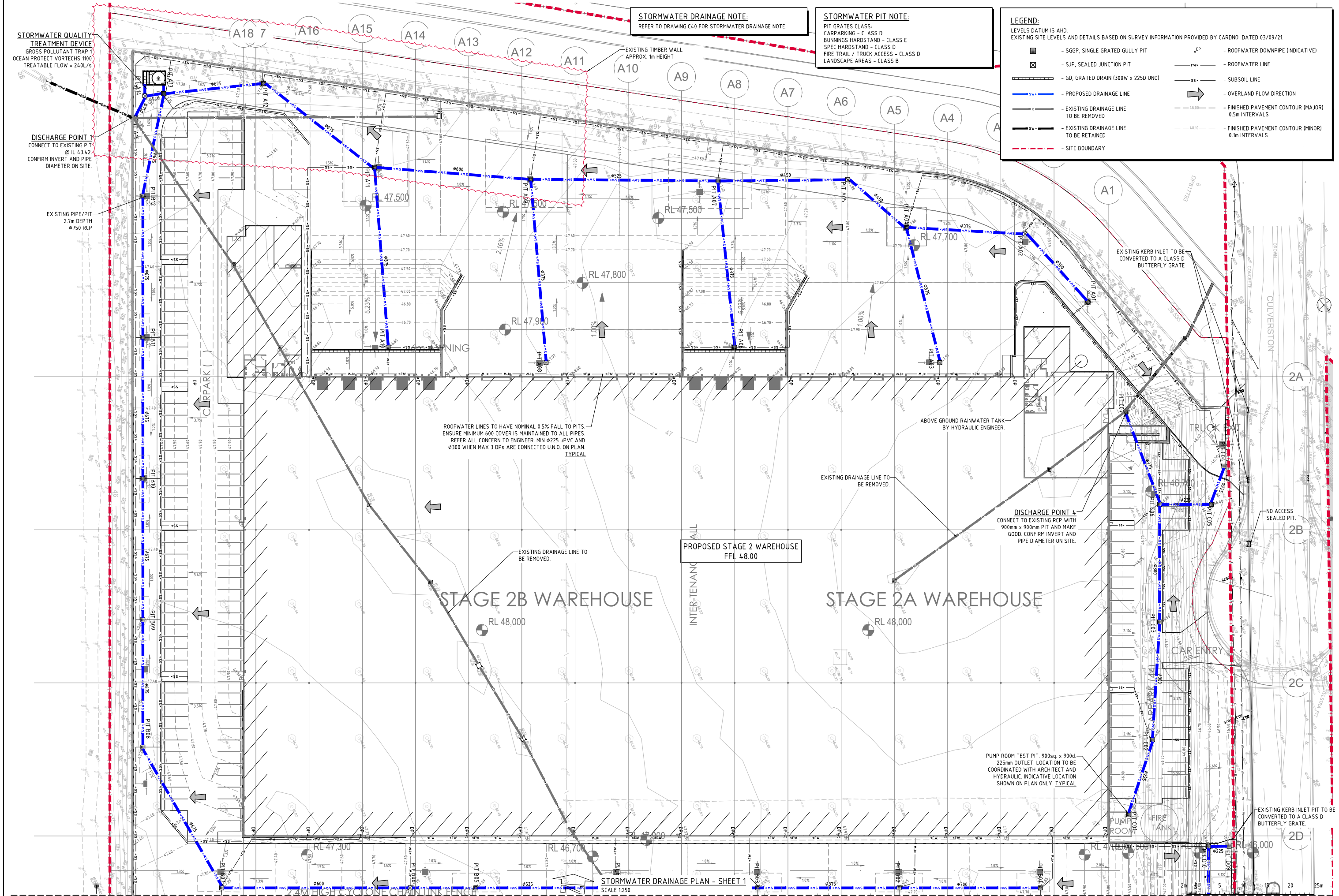
| PIT SCHEDULE - NETWORK F |          |      |            |         |
|--------------------------|----------|------|------------|---------|
| PIT No.                  | GRATE RL | TYPE | GRATE SIZE | COMMENT |
| PIT F01                  | 47.70    | SGGP | 900 x 900  |         |
| PIT F02                  | 47.65    | SJP  | 900 x 900  |         |
| PIT F03                  | 47.65    | SGGP | 900 x 900  |         |
| PIT F04                  | 47.65    | SJP  | 900 x 900  |         |
| PIT F05                  | 47.96    | SJP  | 900 x 900  |         |
| PIT F06                  | 47.69    | SGGP | 900 x 900  |         |
| PIT F07                  | 47.94    | SGGP | 900 x 900  |         |
| PIT F08                  | 47.91    | SGGP | 900 x 900  |         |

| PIT SCHEDULE - NETWORK G |          |      |            |         |
|--------------------------|----------|------|------------|---------|
| PIT No.                  | GRATE RL | TYPE | GRATE SIZE | COMMENT |
| PIT G01                  | 47.00    | SGGP | 900 x 900  |         |
| PIT G02                  | 47.00    | SGGP | 900 x 900  |         |
| PIT G03                  | 47.00    | SGGP | 900 x 900  |         |

SCALE 1:500 AT A0 SIZE SHEET

PRELIMINARY ONLY





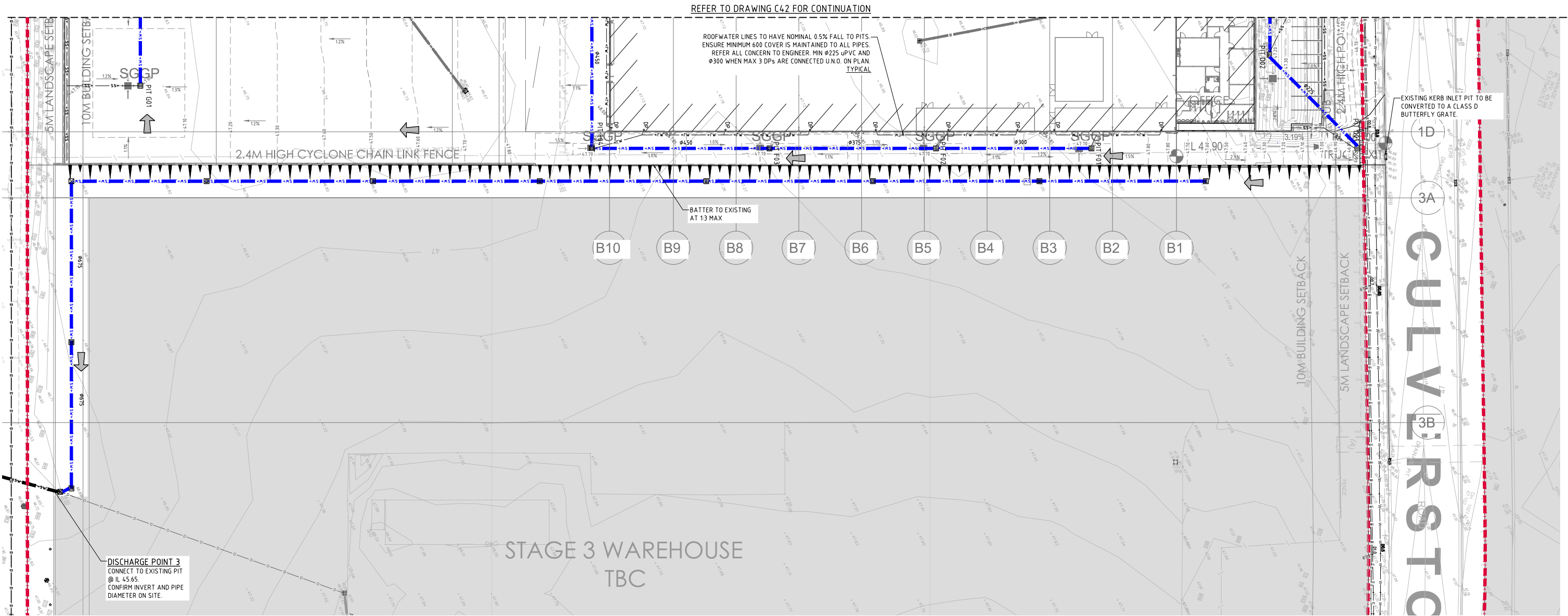




STORMWATER DRAINAGE NOTE:  
REFER TO DRAWING C40 FOR STORMWATER DRAINAGE NOTE.

STORMWATER PIT NOTE:  
PIT GRATES CLASS:  
CARPARKING - CLASS D  
BUNNINGS HARDSTAND - CLASS E  
SPEC HARDSTAND - CLASS D  
FIRE TRAIL / TRUCK ACCESS - CLASS D  
LANDSCAPE AREAS - CLASS B

- LEGEND:  
LEVELS DATUM IS AHD.  
EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY CARDNO DATED 03/09/21.
- |  |                                         |  |                                                    |
|--|-----------------------------------------|--|----------------------------------------------------|
|  | - SGGP, SINGLE GRATED GULLY PIT         |  | - ROOFWATER DOWNPIPE (INDICATIVE)                  |
|  | - SJP, SEALED JUNCTION PIT              |  | - ROOFWATER LINE                                   |
|  | - GD, GRATED DRAIN (300W x 225D UNO)    |  | - SUBSOIL LINE                                     |
|  | - PROPOSED DRAINAGE LINE                |  | - OVERLAND FLOW DIRECTION                          |
|  | - EXISTING DRAINAGE LINE TO BE REMOVED  |  | - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS |
|  | - EXISTING DRAINAGE LINE TO BE RETAINED |  | - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS |
|  | - SITE BOUNDARY                         |  |                                                    |



STORMWATER DRAINAGE PLAN - SHEET 3  
SCALE 1:250

PRELIMINARY ONLY

2m 0 5 10 15 20 25m  
SCALE 1:250 AT A0 SIZE SHEET

|                  |          |       |
|------------------|----------|-------|
| PRELIMINARY ONLY | 04.02.22 | B     |
| PRELIMINARY ONLY | 21.01.22 | A     |
| AMENDMENTS       | DATE     | ISSUE |



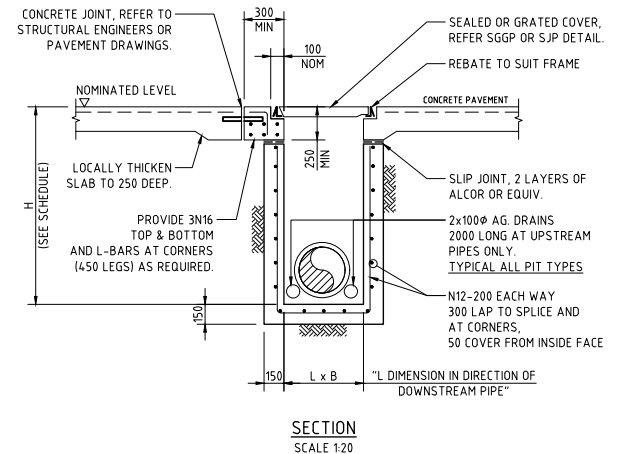
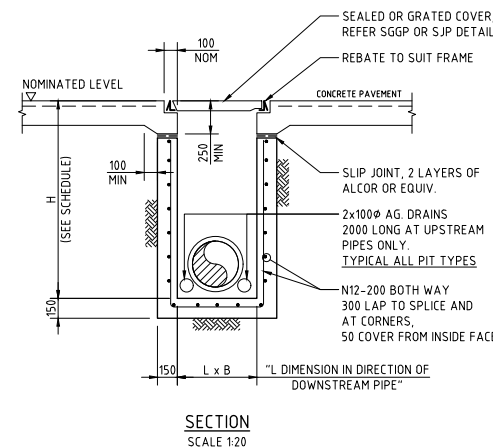
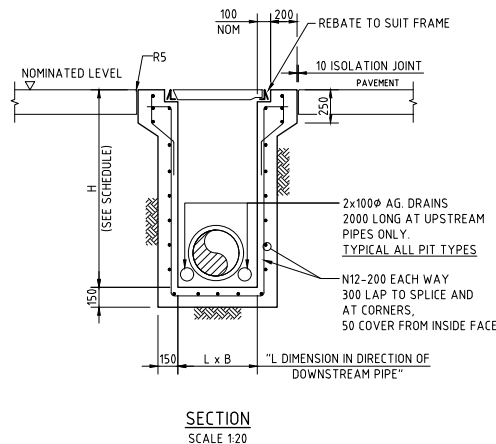
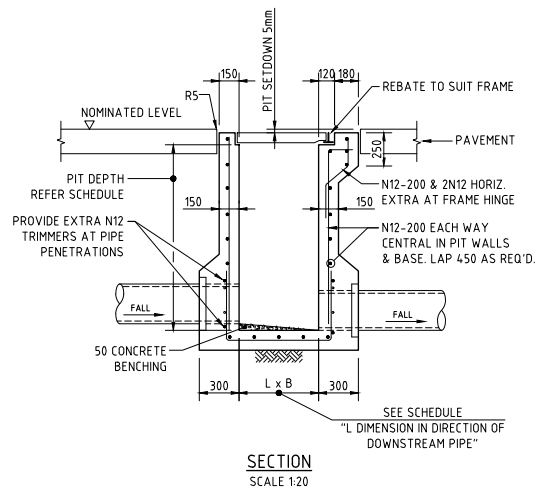
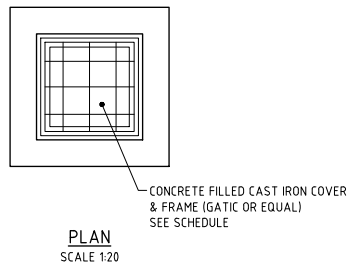
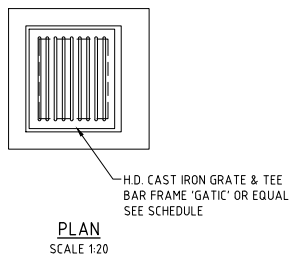
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|----------|-------|--------|---------|------|----------|----------------|
| DESIGNED | DRAWN | DATE   | CHECKED | SIZE | SCALE    | CAD REF.       |
| ML       | ML    | JAN 22 | MW      | A0   | AS SHOWN | C014506.01-C43 |

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|               |                                    |
|---------------|------------------------------------|
| DRAWING TITLE | STORMWATER DRAINAGE PLAN - SHEET 3 |
| DRAWING NO.   | C014506.01-C43                     |
| REVISION      | B                                  |

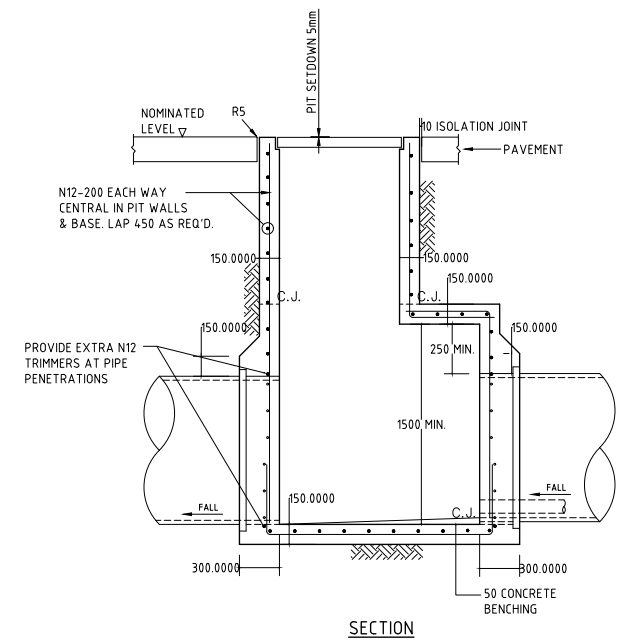
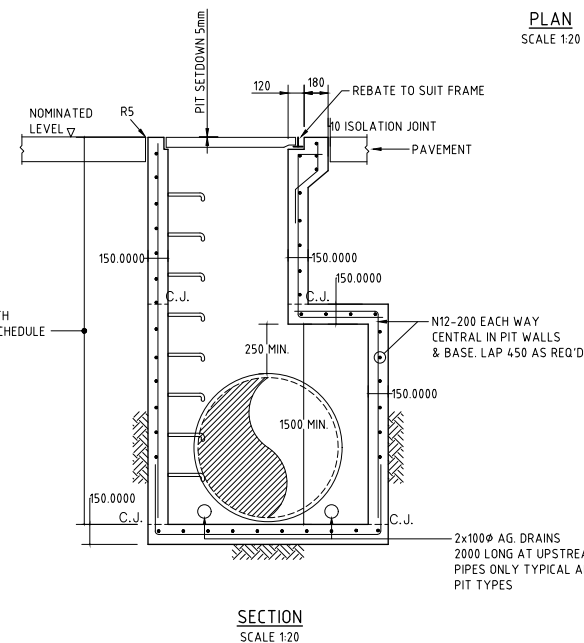
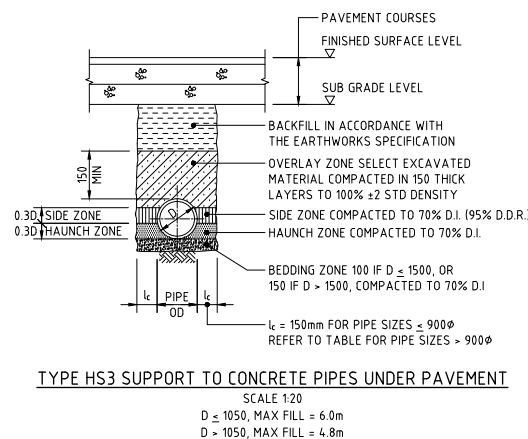
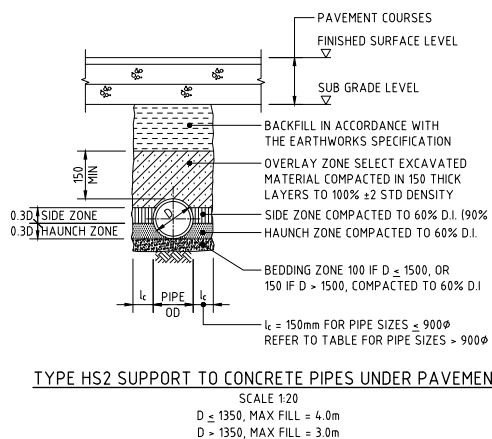
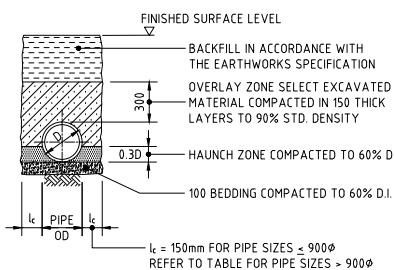
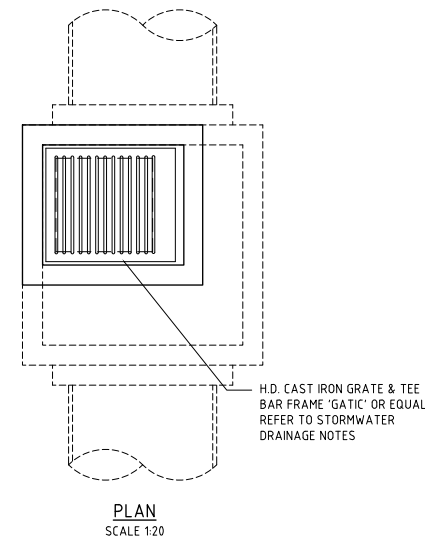
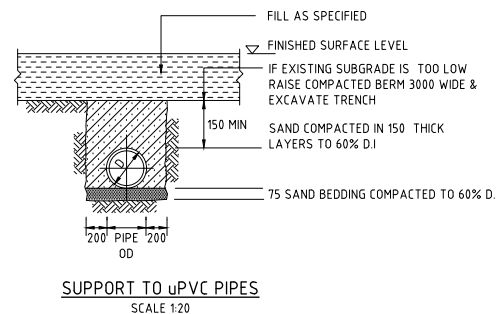
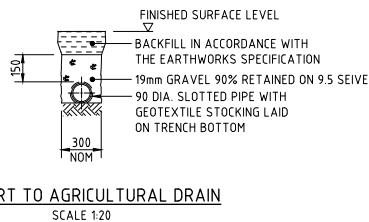




SJP/CIS & SGGP/CIS (CAST IN SLAB) PIT DETAIL  
GRATE/COVER SUPPORT  
CAST-INTO PAVEMENT SLAB  
(ADOPT IN CONCRETE PAVEMENTS FOR SGGP's & SJP's, WHERE JOINTS ARE NOT LOCATED WITHIN PROXIMITY OF THE GRATE)

SJP/CIS & SGGP/CIS (CAST IN SLAB) PIT DETAIL  
GRATE/COVER SUPPORT  
CAST-INTO PAVEMENT SLAB  
(ADOPT IN CONCRETE PAVEMENT FOR SGGP's & SJP's, WHERE PITS ARE LOCATED IN THE CORNER OF SLAB PANELS OR ADJACENT TO SLAB PANEL JOINTS)

| CONCRETE QUALITY |      |                       |             |                 |
|------------------|------|-----------------------|-------------|-----------------|
| ELEMENT          | SUMP | AGGREGATE (MAX. SIZE) | CEMENT TYPE | ADMIXTURE (PPM) |
| PIT              | 80   | 20                    | GP          | NIL             |



| BEDDING & HAUNCH MATERIAL GRADING |                    |
|-----------------------------------|--------------------|
| SIEVE SIZE (mm)                   | WEIGHT PASSING (%) |
| 19.0                              | 100                |
| 2.36                              | 100 TO 50          |
| 0.60                              | 90 TO 50           |
| 0.30                              | 60 TO 10           |
| 0.15                              | 25 TO 0            |
| 0.075                             | 10 TO 0            |

| SIDE ZONE WIDTH                                                    |                     |
|--------------------------------------------------------------------|---------------------|
| PIPE SIZE (mm)                                                     | l <sub>c</sub> (mm) |
| ≤ 900                                                              | 150                 |
| 1050                                                               | 175                 |
| 1200                                                               | 200                 |
| 1350                                                               | 225                 |
| 1500                                                               | 250                 |
| 1650                                                               | 275                 |
| 1800                                                               | 300                 |
| ENGINEER TO SPECIFY TRENCH WIDTHS FOR PIPE SIZES GREATER THAN 1800 |                     |

| SIDE ZONE MATERIAL GRADING                              |                    |
|---------------------------------------------------------|--------------------|
| SIEVE SIZE (mm)                                         | WEIGHT PASSING (%) |
| 19.0                                                    | 100                |
| 9.5                                                     | 100 TO 50          |
| 2.6                                                     | 100 TO 30          |
| 0.60                                                    | 50 TO 15           |
| 0.075                                                   | 25 TO 0            |
| SELECT FILL MATERIAL IN ACCORDANCE WITH TABLE 1 AS 3725 |                    |

PRELIMINARY ONLY

SCALE 1:20 AT A0 SIZE SHEET





FINISHED LEVELS PLAN NOTES:

- LEVELS DATUM IS AUSTRALIAN HEIGHT DATUM (A.H.D.).
- GRADING REQUIREMENTS TO BE COMPLETED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS2890.1, AS2890.2 AND AS2890.6.
- ALL CONTOUR LINES & SPOT LEVELS INDICATE FINISHED PAVEMENT LEVELS U.N.O. ON PLAN. CONTOUR INTERVALS
  - THE MINOR CONTOUR INTERVAL IS 0.1m.
  - THE MAJOR CONTOUR INTERVAL IS 0.5m.
- HARDSTAND GRADING
  - MINIMUM PAVEMENT GRADE IS TO BE 1:100 (1%).
  - GRADING OF ON-GRADE DOCKS TO BE 1:100 (1%) FALL AWAY FROM THE DOCK FACE FOR A LENGTH OF 15m U.N.O.
  - GRADING OF TRUCK CIRCULATION ZONES TO BE MINIMUM AS NOTED ABOVE, 3-4% NOMINAL AND MAX. 5%.
- CAR PARKING AREA GRADES
  - MINIMUM PAVEMENT GRADE IS TO BE 1:100 (1%), DESIRABLE MINIMUM GRADE 1:50 (2%).
  - MAXIMUM PAVEMENT GRADE IS TO BE 1:20 (5%) IN CARPARKING AREAS AND 1:25 (4%) ELSEWHERE.
  - DISABLED ACCESS PARKING ZONES AND SHARED SPACE TO BE MAXIMUM OF 1:33 (3%) IN ASPHALT PAVEMENT AND MAXIMUM OF 1:40 (2.5%) IN CONCRETE PAVEMENT.

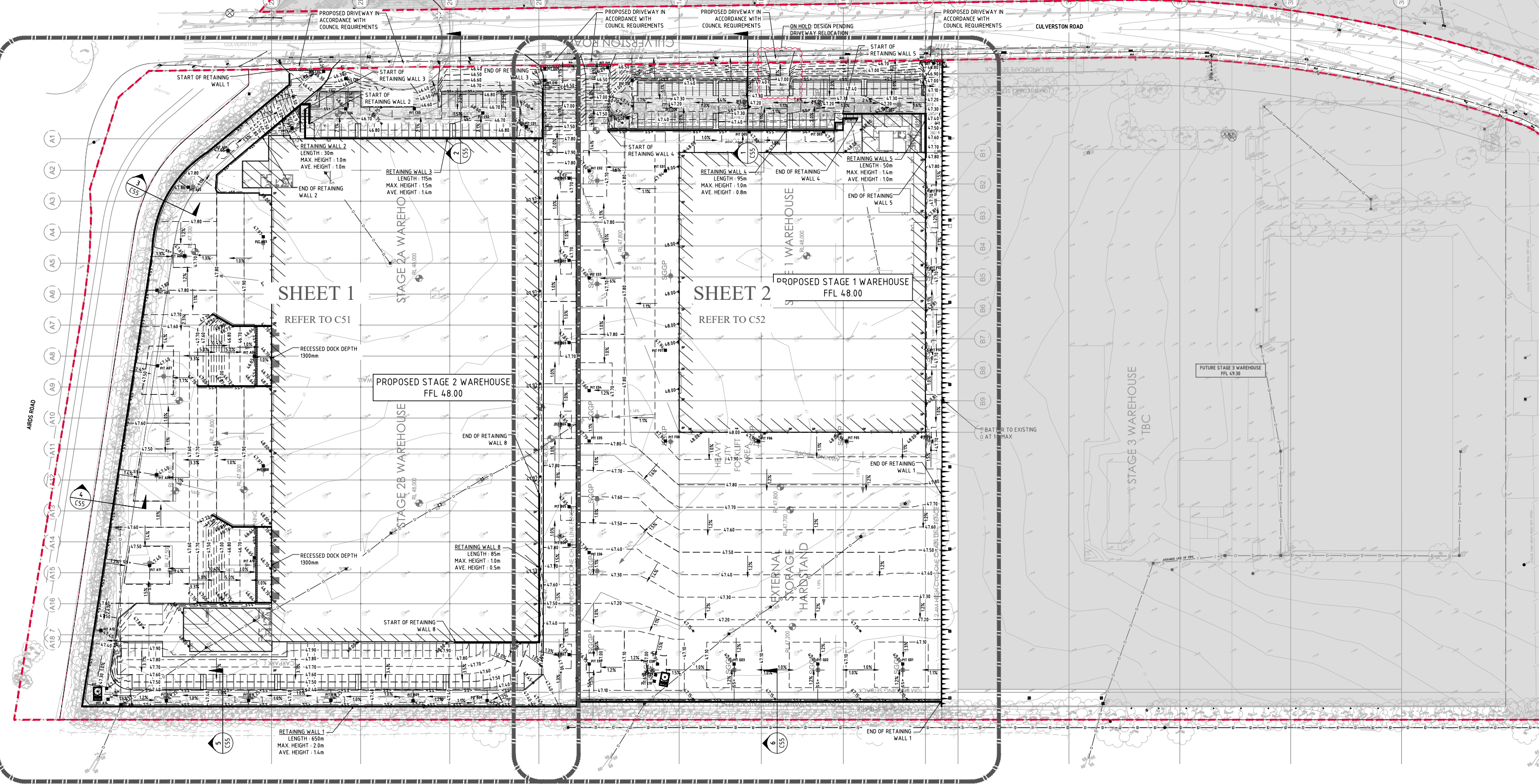
- TRUCK RAMP GRADES
  - CARPARK RAMP GRADES TO BE MAX 1:5 WITH 2.5m SMOOTH TRANSITION AT TOP AND BOTTOM U.N.O.
  - MAXIMUM B-DOUBLE OR 19.0m AV RAMP GRADES ARE TO BE 1:8.3 (12%) U.N.O. ON PLAN.
  - PROVIDE MINIMUM 4.0m LONG TRANSITION WHERE CHANGES OF GRADE EXCEED 1:20 (5%) AT A CREST U.N.O.
  - PROVIDE MINIMUM 3.0m LONG TRANSITION WHERE CHANGE OF GRADE EXCEED 1:20 (5%) AT A SAG U.N.O.
  - TRANSITIONS ARE TO PROVIDE A SMOOTH CONTINUOUS CIRCULAR AND TANGENTIAL CHANGE IN GRADE TO ENSURE NO SHARP OR ACUTE CHANGES IN GRADE ARE PRESENT.
- WHERE FIRE BRIGADE ACCESS IS REQUIRED, MAXIMUM RAMP GRADIENTS ARE TO BE 1:6 (16.6%), DESIRABLE RAMP GRADIENTS ARE TO BE 1:8 (12.5%) WITH 7m TRANSITION TOP AND BOTTOM U.N.O. ON PLAN.
- PERMANENT BATTER SLOPES ARE TO HAVE A MAXIMUM GRADE OF 1V:3H U.N.O. BASED ON GEOTECHNICAL ASSESSMENT. PROVIDE MINIMUM 0.5m BERM BETWEEN THE BACK OF KERB OR PAVEMENT EDGES AND THE TOP OR TOE OF A BATTER.

- PERMANENT BATTER SLOPES ARE TO HAVE A MAXIMUM GRADE OF 1V:3H U.N.O. BASED ON GEOTECHNICAL ASSESSMENT. PROVIDE MINIMUM 0.5m BERM BETWEEN THE BACK OF KERB OR PAVEMENT EDGES AND THE TOP OR TOE OF A BATTER.
- ALL BATTER SLOPE WITH GRADES AT OR EXCEEDING 1V:6H ARE TO BE TURFED IMMEDIATELY OR APPROPRIATE EROSION CONTROL IS TO BE PROVIDED TO THE SATISFACTION OF THE ENGINEER.
- ALL FOOTPATHS ARE TO FALL AWAY FROM THE BUILDING AT 2.5% NOMINAL GRADE. ALL PAVEMENTS ARE TO BE SET AT 30mm BELOW THE FINISHED FLOOR LEVEL OF THE WAREHOUSE AND OFFICE AREAS U.N.O. ON PLAN. PROVIDE LOCAL FEATHERING AT DOORWAYS OR ROLLER SHUTTERS TO PROVIDE FLUSH FINISH AS REQUIRED.
- WHERE NEW AND EXISTING INTERFACING IS REQUIRED, MATCH EXISTING LEVELS AND PROVIDE SMOOTH INTERFACE BETWEEN NEW AND EXISTING GRADIENTS. REFER ANY CONCERNS TO THE ENGINEER.

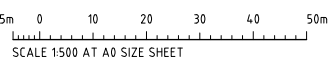
LEGEND:

LEVELS DATUM IS AHD.

- SGGP, SINGLE GRATED GULLY PIT
- S/J, SEALED JUNCTION PIT
- GD, GRATED DRAIN (300W x 225D U.N.O)
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- SITE BOUNDARY
- SITE RETAINING WALL



FINISHED LEVELS KEY PLAN  
SCALE 1:500



PRELIMINARY ONLY

|                  |          |       |
|------------------|----------|-------|
| PRELIMINARY ONLY | 06.02.22 | B     |
| PRELIMINARY ONLY | 21.01.22 | A     |
| AMENDMENTS       | DATE     | ISSUE |

ARCHITECT

**PACE**  
ARCHITECTS

BUILDER / PROJECT MANAGER

**texco**

CLIENT

**Charter Hall**

PROJECT

PROPOSED INDUSTRIAL DEV'T  
STAGE 1 & STAGE 2  
5-9 CULVERSTON ROAD, MINTO NSW 2566

COSTIN ROE CONSULTING PTY LTD.

Consulting Engineers  
Level 1, 8 Widdowall Street  
Wahia Bay, Sydney NSW 2000  
Tel: (02) 8551-7699 Fax: (02) 9541-3721  
email: mail@costinroe.com.au

**Costin Roe Consulting**

PRECISION | COMMUNICATION | ACCOUNTABILITY

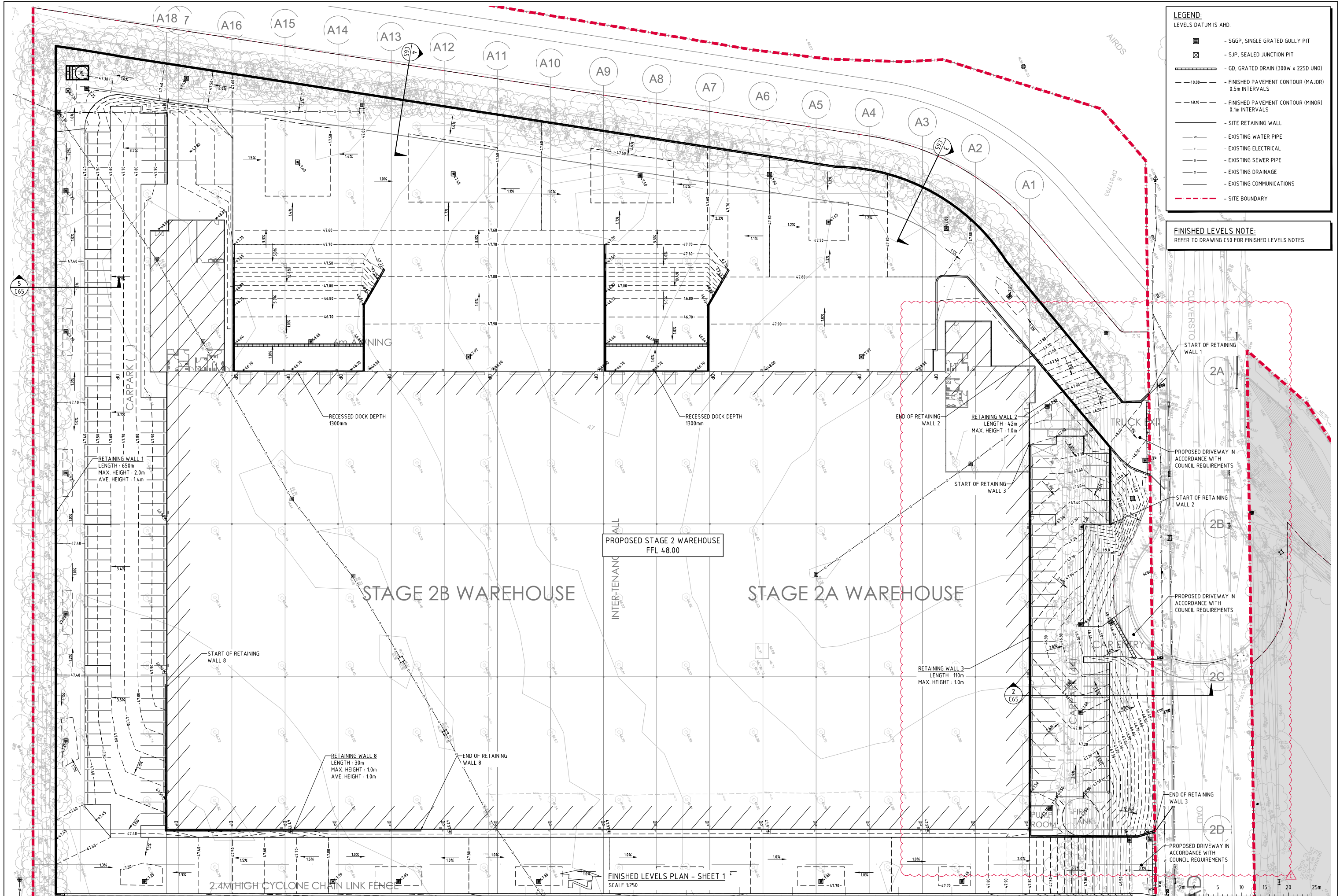
DRAWING TITLE

FINISHED LEVELS KEY PLAN

DRAWING No: C014506.01-C50

FIGURE B





**LEGEND:**  
LEVELS DATUM IS AHD.

- SGGP, SINGLE GRATED GULLY PIT
- S.J.P, SEALED JUNCTION PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- 48.00 - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 48.10 - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- SITE RETAINING WALL
- EXISTING WATER PIPE
- EXISTING ELECTRICAL
- EXISTING SEWER PIPE
- EXISTING DRAINAGE
- EXISTING COMMUNICATIONS
- SITE BOUNDARY

**FINISHED LEVELS NOTE:**  
REFER TO DRAWING C50 FOR FINISHED LEVELS NOTES.

PROPOSED STAGE 2 WAREHOUSE  
FFL 48.00

STAGE 2B WAREHOUSE

STAGE 2A WAREHOUSE

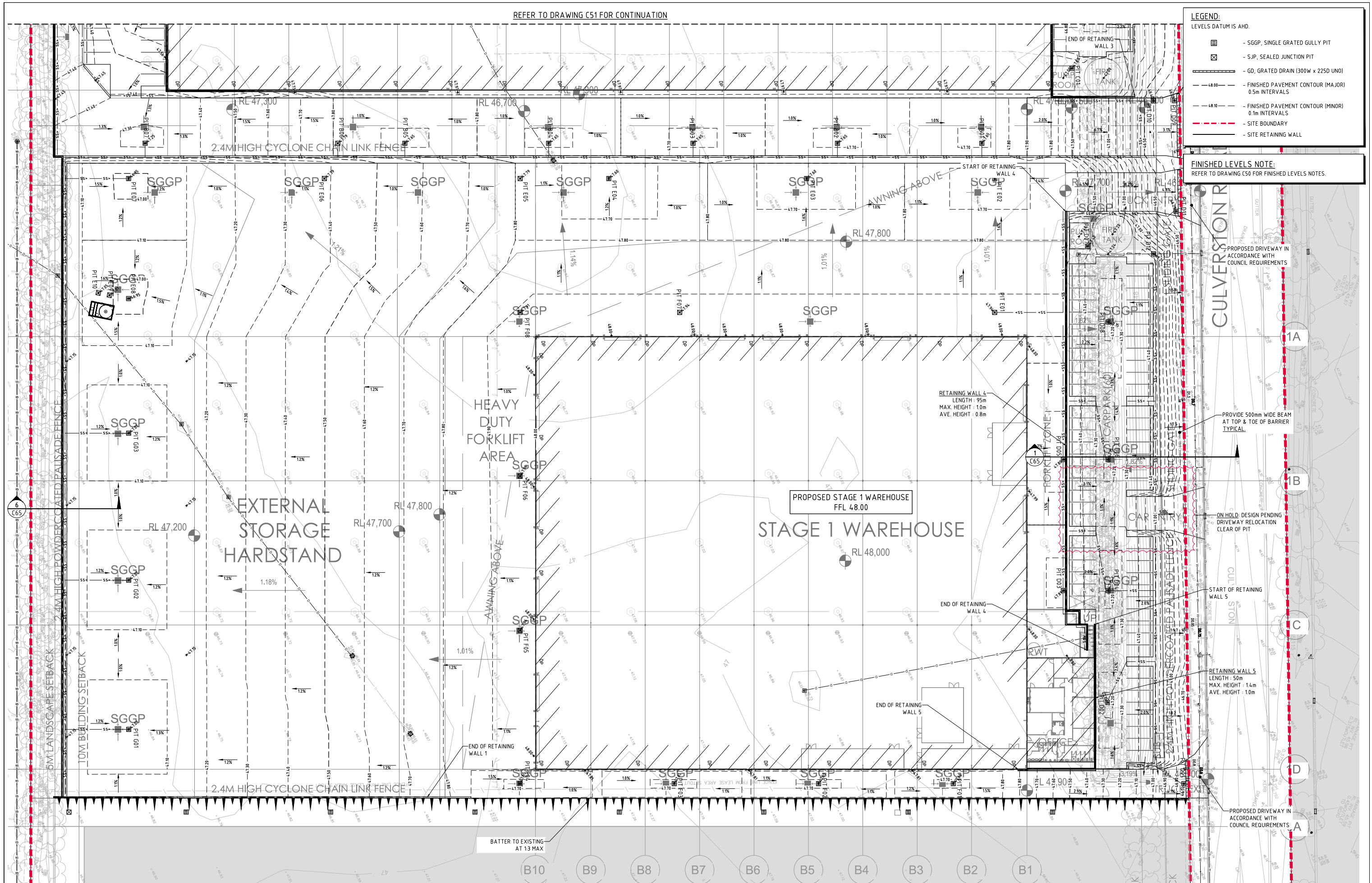
FINISHED LEVELS PLAN - SHEET 1  
SCALE 1:250

REFER TO DRAWING C52 FOR CONTINUATION

**PRELIMINARY ONLY**

SCALE 1:250 AT A0 SIZE SHEET





|                  |          |       |
|------------------|----------|-------|
| PRELIMINARY ONLY | 04.02.22 | B     |
| PRELIMINARY ONLY | 21.01.22 | A     |
| AMENDMENTS       | DATE     | ISSUE |

|           |                           |
|-----------|---------------------------|
| ARCHITECT | <b>PACE</b><br>ARCHITECTS |
|-----------|---------------------------|

|                           |              |
|---------------------------|--------------|
| BUILDER / PROJECT MANAGER | <b>texco</b> |
|---------------------------|--------------|

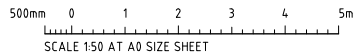
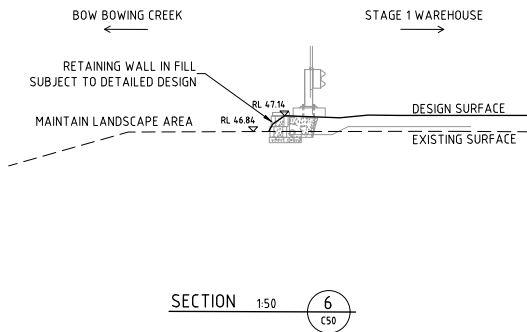
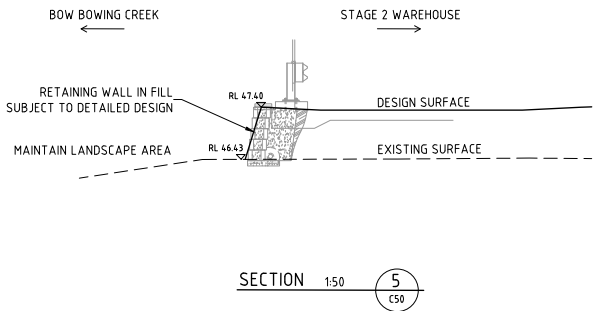
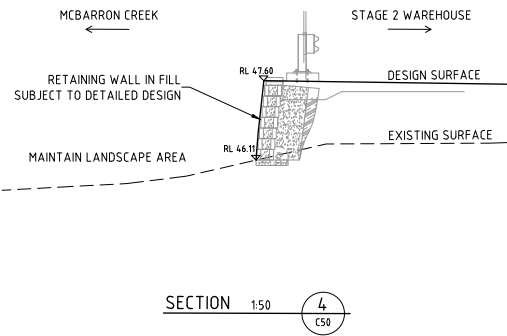
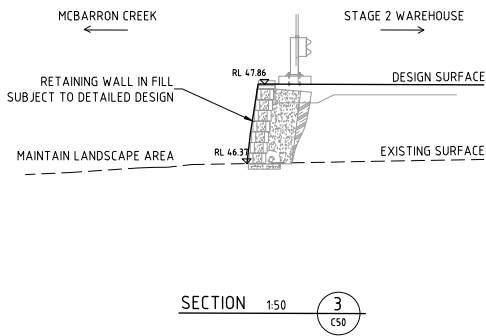
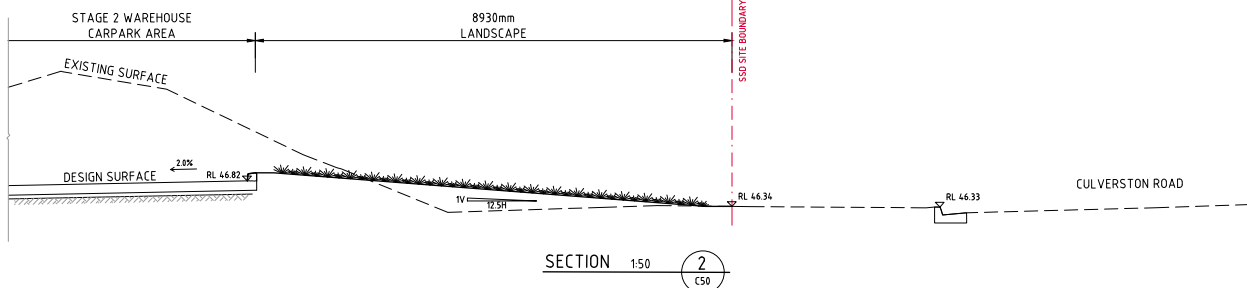
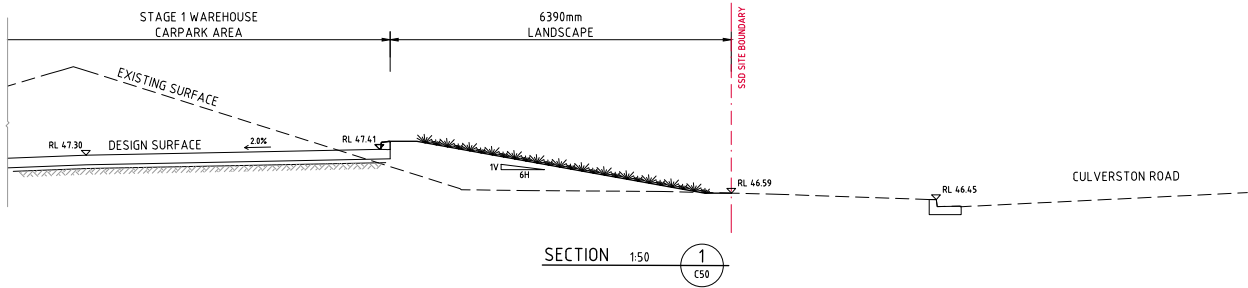
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|--------|---------------------|
| CLIENT | <b>Charter Hall</b> |
|--------|---------------------|

|          |                                                                                       |
|----------|---------------------------------------------------------------------------------------|
| PROJECT  | PROPOSED INDUSTRIAL DEV'T<br>STAGE 1 & STAGE 2<br>5-9 CULVERSTON ROAD, MINTO NSW 2566 |
| DESIGNED | DATE: JAN 22                                                                          |
| CHECKED  | DATE: JAN 22                                                                          |
| SCALE    | AS SHOWN                                                                              |
| CAD REF: | C014506.01-C52                                                                        |

|                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

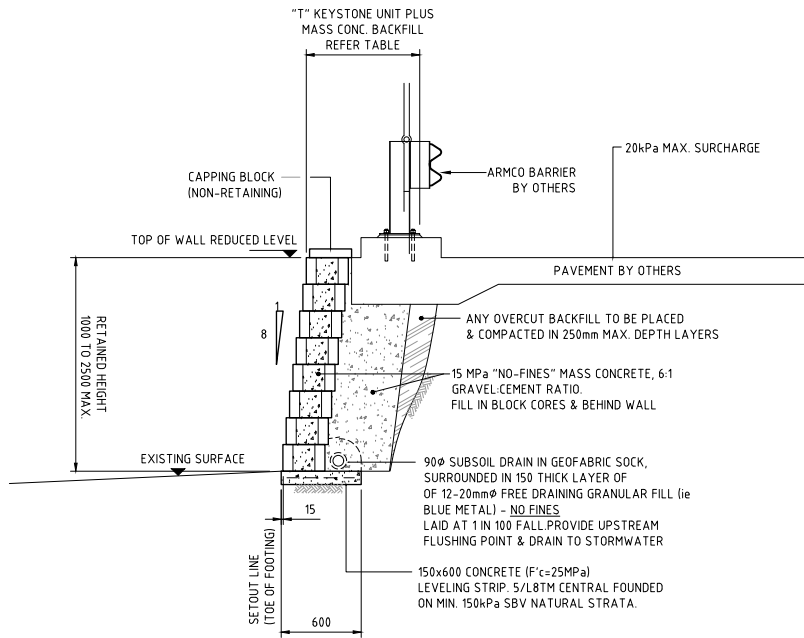
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| <b>PRELIMINARY ONLY</b>                    | <b>Costin Roe Consulting</b> |
| PRECISION   COMMUNICATION   ACCOUNTABILITY |                              |

|               |                                |
|---------------|--------------------------------|
| DRAWING TITLE | FINISHED LEVELS PLAN - SHEET 2 |
| DRAWING NO.   | C014506.01-C52                 |
| REVISION      | B                              |



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|                                |  |  |                                        |  |  |                                           |  |  |                               |  |  |                                                                                                  |  |  |                                                                                                                                                                                                      |  |  |                                            |  |  |
|--------------------------------|--|--|----------------------------------------|--|--|-------------------------------------------|--|--|-------------------------------|--|--|--------------------------------------------------------------------------------------------------|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--------------------------------------------|--|--|
| PRELIMINARY ONLY<br>AMENDMENTS |  |  | ARCHITECT<br><b>PACE</b><br>ARCHITECTS |  |  | BUILDER / PROJECT MANAGER<br><b>texco</b> |  |  | CLIENT<br><b>Charter Hall</b> |  |  | PROJECT<br>PROPOSED INDUSTRIAL DEV'T<br>STAGE 1 & STAGE 2<br>5-9 CULVERSTON ROAD, MINTO NSW 2566 |  |  | CONSULTING ENGINEERS<br><b>Costin Roe Consulting Pty Ltd.</b><br>Level 1, 8 Windmill Street<br>Wahah Bay, Sydney NSW 2000<br>Tel: (02) 8551-7889 Fax: (02) 9541-3721<br>email: mail@costinroe.com.au |  |  | DRAWING TITLE<br>TYPICAL SECTIONS          |  |  |
| 04.02.22<br>DATE               |  |  | A<br>ISSUE                             |  |  | AMENDMENTS                                |  |  | DATE                          |  |  | ISSUE                                                                                            |  |  | DESIGNED<br>ML                                                                                                                                                                                       |  |  | DRAWING No<br>C014506.01-C55               |  |  |
|                                |  |  |                                        |  |  |                                           |  |  |                               |  |  | CHECKED<br>ML                                                                                    |  |  | DATE<br>JAN 22                                                                                                                                                                                       |  |  | SCALE<br>A0                                |  |  |
|                                |  |  |                                        |  |  |                                           |  |  |                               |  |  | SIZE<br>A0                                                                                       |  |  | AS SHOWN                                                                                                                                                                                             |  |  | CNO REF:<br>C014506.01-C55                 |  |  |
|                                |  |  |                                        |  |  |                                           |  |  |                               |  |  |                                                                                                  |  |  |                                                                                                                                                                                                      |  |  | PRECISION   COMMUNICATION   ACCOUNTABILITY |  |  |
|                                |  |  |                                        |  |  |                                           |  |  |                               |  |  |                                                                                                  |  |  |                                                                                                                                                                                                      |  |  | REVISION<br>A                              |  |  |

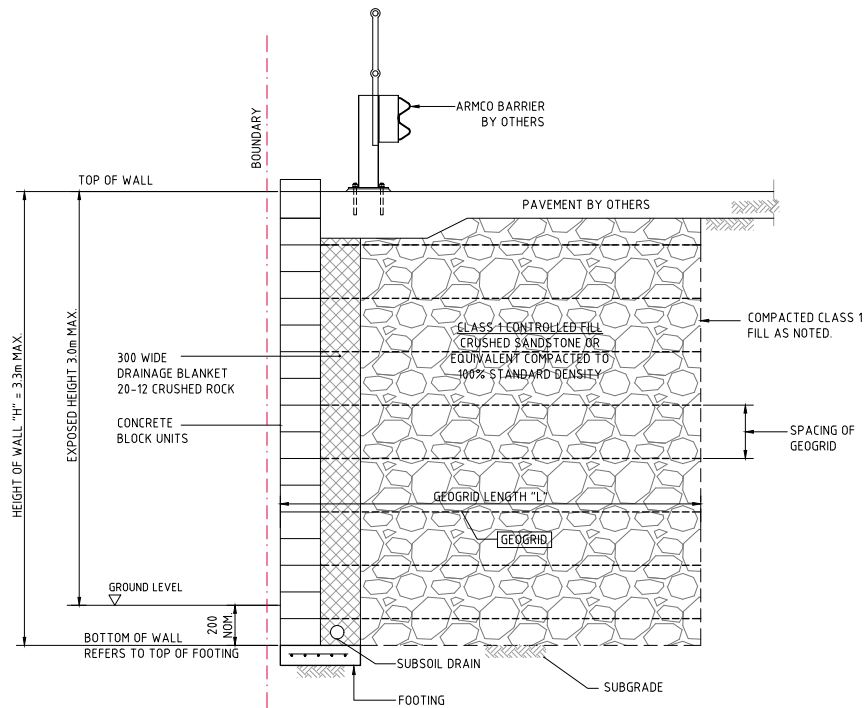


TYPICAL THRU' KEYSTONE RETAINING WALL  
(1000 TO 2500 MAXIMUM RETAINED HEIGHT)  
SCALE 1:20

| KEYSTONE WALL SPECIFICATIONS : |                                                     |
|--------------------------------|-----------------------------------------------------|
| RETAINED HEIGHT (mm)           | OVERALL THICKNESS "T" (mm)                          |
| UP TO 1000                     | DESIGN TO BE CONFIRMED / PROVIDED BY D-C CONTRACTOR |
| 1000 TO 1200                   |                                                     |
| 1200 TO 1800                   |                                                     |
| 1800 TO 2400                   |                                                     |
| 2400 TO 2500                   |                                                     |

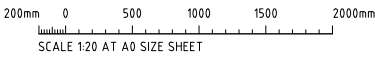
RETAINING WALL NOTES:

- ALL COMPONENTS AND INSTALLATION SHALL COMPLY WITH AS4678 AND THE STANDARDS REFERRED TO THEREIN.
- MINIMUM BEARING CAPACITY OF FOUNDATION TO BE AS FOLLOWS :
  - H MAX. 2.0m = 100 kPa
  - H MAX. 3.5m = 150 kPa
  - H MAX. 5.0m = 200 kPaBEFORE COMMENCEMENT OF CONSTRUCTION THE FOUNDATION SHALL BE INSPECTED AND VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.
- WHERE MINIMUM BEARING IS NOT ACHIEVABLE OR NOT MEETING DESIGN REQUIREMENT, THE FOUNDATION MATERIAL IS TO BE EXCAVATED AND REPLACED WITH APPROVED MATERIAL PLACED IN ACCORDANCE WITH THE FILLING SPECIFICATION TO A MINIMUM COMPACTION OF 100% SMD AND PLACED WITHIN 2% OF OMC.
- MINIMUM SURCHARGE LOADS TO BE APPLIED AS FOLLOWS U.N.O.
- ON PLAN :
  - LIVE LOAD = 20 kPa
  - DEAD LOAD = 5 kPa
  - CONSTRUCTION TRAFFIC LIVE LOAD = 10 kPa
- MINIMUM WALL EMBEDMENT AT THE TOE OF THE WALL TO BE 300mm MINIMUM UNLESS NOTED OTHERWISE.
- DESIGN LIFE OF STRUCTURE IS TO BE 100 YEARS.
- TIED WALLS ARE TO BE TEMPORARILY PROPPED AT TOP UNTIL SUCH TIME THE TOP OF WALL IS TIED TO THE SLAB AND 28-DAY CONCRETE STRENGTH HAS BEEN ACHIEVED.
- CONSTRUCTION EQUIPMENT WEIGHING MORE THAN 500KG STATIC WEIGHT IS TO BE KEPT BACK 15m FROM THE REAR FACE OF THE WALL FACING UNITS. COMPACTION OF THE SELECT FILL MATERIAL WITHIN THE 15m STRIP ADJACENT TO THE WALL SHALL BE ACHIEVED BY LIGHT MECHANICAL TAMPERS (VIBRATING PLATE, TRENCH COMPACTOR OR SIMILAR) TO GIVE THE SAME DENSITY AS IN THE REMAINDER OF THE SELECT FILL.
- ALL DESIGN AND CONSTRUCT WALL SYSTEM TO BE COMPLETED IN ACCORDANCE WITH THESE NOTES.



CONCRETE BLOCK REINFORCED EARTH WALL DETAIL  
SCALE 1:20

REINFORCED EARTH RETAINING WALL  
STRUCTURAL DESIGN TO D-C CONTRACTOR.



PRELIMINARY ONLY

|                  |          |       |            |      |       |
|------------------|----------|-------|------------|------|-------|
| PRELIMINARY ONLY | 21/01/22 | B     |            |      |       |
| PRELIMINARY ONLY | 21/01/22 | A     |            |      |       |
| AMENDMENTS       | DATE     | ISSUE | AMENDMENTS | DATE | ISSUE |



|                                                                                                  |             |                |               |            |                   |                                                                                       |
|--------------------------------------------------------------------------------------------------|-------------|----------------|---------------|------------|-------------------|---------------------------------------------------------------------------------------|
| PROJECT<br>PROPOSED INDUSTRIAL DEV'T<br>STAGE 1 & STAGE 2<br>5-9 CULVERSTON ROAD, MINTO NSW 2566 |             |                |               |            |                   |  |
| DESIGNED<br>ML                                                                                   | DRAWN<br>ML | DATE<br>JAN 22 | CHECKED<br>MW | SIZE<br>A0 | SCALE<br>AS SHOWN | CAD REF:<br>C014506.01-C65                                                            |



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Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

|               |                        |
|---------------|------------------------|
| DRAWING TITLE | RETAINING WALL DETAILS |
| DRAWING No    | C014506.01-C65         |
| REVISION      | B                      |

## **APPENDIX B**

## **CONSULTATION**

---

**From:** Mark Wilson  
**Sent:** Friday, 11 March 2022 1:36 PM  
**To:** 'Ellise Mangion' <Ellise.Mangion@campbelltown.nsw.gov.au>  
**Cc:** Cathy Kinsey <cathy.kinsey@campbelltown.nsw.gov.au>; Shafiul Salam <Shafiul.Salam@campbelltown.nsw.gov.au>; Thomas Bertwistle <Thomas.Bertwistle@planning.nsw.gov.au>; Stephen McDiarmid <Stephen.McDiarmid@campbelltown.nsw.gov.au>; 'Nathan Cairney' <ncairney@tacticalgroup.com.au>; 'Justin Crameri' <jcrameri@texco.net.au>; Xavier.Cure@costinroe.com.au  
**Subject:** RE: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B11 Stormwater Management Plan

Ellise,  
Thanks for coming back to us.

Please find attached the stormwater drawings including long sections, and Drains model as requested.

Note there is no music modelling required as part of the SSDA approved water quality system, hence this model has not been provided.

In regard to the nominated pipe class, there are no Council pipes required as part of the private development and as such the specification of pipe class at the discretion of the proponent based on Australian Standards, vehicle loading and HS2 bedding. The pits, again are private pits and designed to suit loading per the Australian Standards and client brief.

---

**From:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>  
**Sent:** Thursday, 10 March 2022 2:45 PM  
**To:** Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>; Mark Wilson <[Mark@costinroe.com.au](mailto:Mark@costinroe.com.au)>  
**Cc:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>; Shafiul Salam <[Shafiul.Salam@campbelltown.nsw.gov.au](mailto:Shafiul.Salam@campbelltown.nsw.gov.au)>; Stephen McDiarmid <[Stephen.McDiarmid@campbelltown.nsw.gov.au](mailto:Stephen.McDiarmid@campbelltown.nsw.gov.au)>  
**Subject:** RE: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B11 Stormwater Management Plan

Hi Thomas,

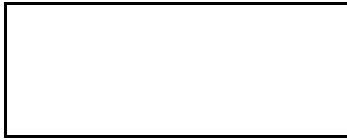
MUSIC and DRAINS modelling has not been provided in accordance with condition B11(B).

Additional plans are also required including stormwater long sections and

Council also requests that the stormwater drainage pipes under traffic loading areas are Class 3 pipes and all pit grades are heavy duty.

Regards,





**Ellise Mangion**  
Senior Development Planner



P: 02 4645 4608  
E: [Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)

[www.campbelltown.nsw.gov.au](http://www.campbelltown.nsw.gov.au)



Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.

---

**From:** Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>  
**Sent:** Thursday, 3 March 2022 4:11 PM  
**To:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>  
**Cc:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>  
**Subject:** RE: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan )

Hi Ellise,

The Department is in a position to determine the relevant management plans and note that we are still waiting on comments on the Stormwater Management Plan. I understand this was supplied to Council on 20 January 2022. Was Council intending to provide comments on this?

Kind regards,

**Tom Bertwistle**  
Environmental Assessment Officer  
Industry Assessments  
**Department of Planning and Environment**

T (02) 8275 1025 E [thomas.bertwistle@panning.nsw.gov.au](mailto:thomas.bertwistle@panning.nsw.gov.au)

[dpie.nsw.gov.au](http://dpie.nsw.gov.au)

4 Parramatta Square  
12 Darcy Street  
Parramatta NSW 2150





I acknowledge the traditional custodians of the land and pay respects to Elders past and present. I also acknowledge all the Aboriginal and Torres Strait Islander staff working with NSW Government at this time.

Please consider the environment before printing this email.



**From:** Mark Wilson <Mark@costinroe.com.au>  
**Sent:** Friday, 18 February 2022 7:21 PM  
**To:** Ellise Mangion <Ellise.Mangion@campbelltown.nsw.gov.au>  
**Cc:** Thomas Bertwistle <Thomas.Bertwistle@planning.nsw.gov.au>; Justin Crameri <jcrameri@texco.net.au>  
**Subject:** RE: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B11 Consultation (Stormwater Management Plan )

Hi Ellise,

Further to below will there be any comments forthcoming on the SMP and clarification of points noted?

**Best Regards,**

**Mark Wilson**  
**Director**



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**From:** Mark Wilson <[Mark@costinroe.com.au](mailto:Mark@costinroe.com.au)>  
**Sent:** Thursday, 17 February 2022 2:14 PM  
**To:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>

**Cc:** Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>; Justin Crameri <[jcrameri@texco.net.au](mailto:jcrameri@texco.net.au)>

**Subject:** RE: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B11 Consultation (Stormwater Management Plan )

Good Afternoon Ellise,

Just to follow up on the below – can you confirm any further comments on the submitted SMP, which confirms consistency with the EIS?

We confirm and reiterate the items included in the review of the FERP which are relevant to the SMP as follows.

| Page | Council Comment – 10 Feb 2022                                                                                                                                                                                                                                                                                              | CRC Response – 17 Feb 2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13   | <ul style="list-style-type: none"> <li>2.6 discharge should be to Bow Bowing Creek wherever possible. Any flows excess of current discharges to other locations will require assessment and may require system upgrades.</li> </ul>                                                                                        | <ul style="list-style-type: none"> <li>The drainage layout and catchments are consistent with the approved SSD-7500 and SSD-7500 MOD1. We confirm the design conveys the majority of the site discharge via the existing outlets to Bow Bowing Creek and minor catchments (carparking only) to the existing systems in Culverston Road.</li> </ul>                                                                                                                                                                                                                                                                                                                                             |
| 18   | <ul style="list-style-type: none"> <li>3.6 this document appears to cover more than just flooding. The development footprint is &gt;2,500m2 and triggers the need to include water quality treatment as set out in Council's Engineering Design Guide for Development. It is unclear if this has been included.</li> </ul> | <ul style="list-style-type: none"> <li>The document is noted to address condition B13 of SSD-7500 for the FERP only.</li> <li>As part of the reporting requirements of the conditions, Condition C7 requires detailed baseline data, contingency, incident reporting, protocols for periodic review be included in the document. The document as such includes discussion on ground conditions, drainage, climate etc have been included in the document.</li> <li>In relation to water quality, we note this document does not include water quality treatment measures (noting a separate stormwater management plan has been provided to Council). We confirm however that water</li> </ul> |

|  |  |                                                                                                                                                                                             |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | quality measures have been provided for the development as set out in the approved SSD-7500 Mod1 and original SSD-7500 approvals. Refer separate submission and the approved EIS documents. |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Best Regards,

**Mark Wilson**  
Director



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**From:** Mark Wilson <[Mark@costinroe.com.au](mailto:Mark@costinroe.com.au)>  
**Sent:** Monday, 14 February 2022 3:36 PM  
**To:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>  
**Cc:** Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>; Justin Cramer <[jrcramer@texco.net.au](mailto:jrcramer@texco.net.au)>  
**Subject:** RE: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B11 Consultation (Flood Emergency Response Plan )

Ellise,

Further to below – has there been, or will there be, any commentary on the SMP required for CoC B11 submitted per the attached?

I note the comments below (refer those for Page 13 and 18) are relevant to the SMP which relate to water quality and discharge. Will there be anything further?

**Best Regards,**

**Mark Wilson**  
**Director**



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**From:** Mark Wilson <[Mark@costinroe.com.au](mailto:Mark@costinroe.com.au)>  
**Sent:** Monday, 14 February 2022 1:00 PM  
**To:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>  
**Cc:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>; Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>; Justin Crameri <[jcrameri@texco.net.au](mailto:jcrameri@texco.net.au)>  
**Subject:** RE: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan )

Ellise,

Thanks for the comments – you are correct in the FERP is required of the consent conditions. We confirm the design has been completed based on setting floor levels

greater than 0.5m above the 1%AEP as noted. The FERP considers safety for the full range of flood levels to the PMF.

We are now finalising the document and provide the following response to clarify your points. If you require anything further please let me know.

| Page | Council Comment – 10 Feb 2022                                                                                                                                                                                                                   | CRC Response – 14 Feb 2022                                                                                                                                                                                                                                                                                                                                                      |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6    | <ul style="list-style-type: none"> <li>Comment in B14 states pad levels are above the 1%, no levels have been given in the report. “infrastructure has no information on floor levels but has no reason to disbelieve the statement.</li> </ul> | <ul style="list-style-type: none"> <li>The Stage 1 and 2 building floor levels are confirmed in Section 2.2 of the document at RL 48.0m, and confirmation of the development meeting the flood planning requirements is confirmed in Section 4.2.</li> <li>Additional cross referencing has been included in the document to confirm the 1% AEP level and freeboard.</li> </ul> |
| 9    | <ul style="list-style-type: none"> <li>The defined flow path along the northern side of Rose Peyton Dr is also located on the site.</li> </ul>                                                                                                  | <ul style="list-style-type: none"> <li>The FERP covers Stage 1 and 2 development only. The flow Path on Rose Payton is relevant to overall SSD-7500 development (Stage 3 &amp; 4) however the Stage 1 and 2 development extent. No change is proposed.</li> </ul>                                                                                                               |
| 10   | <ul style="list-style-type: none"> <li>The Bow Bowing Creek AHD are RL47 AHD, not RL45 AHD.</li> </ul>                                                                                                                                          | <ul style="list-style-type: none"> <li>The invert of Bow Bowing Creek at the limit of the FERP (i.e. Stage 1 and 2) is RL 45m as quoted and confirmed by survey. The invert of 47m AHD is correct at the extent of the overall SSD7500 approval (ie near Rose Payton Drive) however not relevant to the Stage 1 and 2 document.</li> </ul>                                      |
| 11   | <ul style="list-style-type: none"> <li>The floor level variance of 0.5m is a large variance. No issue if the proposed levels still comply with the performance criteria with respect to flooding 1%AEP + freeboard.</li> </ul>                  | <ul style="list-style-type: none"> <li>The floor variance reference has been removed from the document. We confirm the proposed floor level of RL 48.0m is consistent with the approved SSD-7500 MOD1.</li> </ul>                                                                                                                                                               |
| 13   | <ul style="list-style-type: none"> <li>2.6 discharge should be to Bow Bowing Creek wherever possible. Any flows excess of current discharges to other</li> </ul>                                                                                | <ul style="list-style-type: none"> <li>The drainage layout is consistent with the approved SSD-7500 and SSD-7500 MOD1 and proposed the majority of the site discharge via the existing outlets</li> </ul>                                                                                                                                                                       |

|    |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | locations will require assessment and may require system upgrades.                                                                                                                                                                                                                                                                    | to Bow Bowling Creek and minor catchments (carparking only to the existing systems in Culverston Road).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 18 | <ul style="list-style-type: none"> <li>3.6 this document appears to cover more than just flooding. The development footprint is &gt;2,500m<sup>2</sup> and triggers the need to include water quality treatment as set out in Council's Engineering Design Guide for Development. It is unclear if this has been included.</li> </ul> | <ul style="list-style-type: none"> <li>The document is noted to address condition B13 of SSD-7500 for the FERP only.</li> <li>As part of the reporting requirements of the conditions, Condition C7 requires detailed baseline data, contingency, incident reporting, protocols for periodic review be included in the document. The document as such includes discussion on ground conditions, drainage, climate etc have been included in the document.</li> <li>In relation to water quality, we note this document does not include water quality treatment measures (noting a separate stormwater management plan has been provided to Council). We confirm however that water quality measures have been provided for the development as set out in the approved SSD-7500 Mod1 and original SSD-7500 approvals. Refer separate submission and the approved EIS documents.</li> </ul> |
| 24 | <ul style="list-style-type: none"> <li>Figure 4.3 it should be noted that the depths shown are in the adjacent channel which is why some locations show negative depths</li> </ul>                                                                                                                                                    | <ul style="list-style-type: none"> <li>Noted.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 31 | <ul style="list-style-type: none"> <li>None of the locations are upstream of the site. Further with the time to peak and real time data only updated every 15 minutes, such a system is unlikely to work.</li> <li>Detail on where the evacuation routes first cut off, this will be critical to</li> </ul>                           | <ul style="list-style-type: none"> <li>Real time water level gauge locations have been provided for information, noting that these gauges are not being relied on for formal warning systems. Although downstream of the catchment, the flood response in these sections of the watercourse are similar to those at the subject site.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p>evacuation timing and effectiveness.</p> <ul style="list-style-type: none"> <li>• Would the SES issue site specific warnings or simply regional messaging, regional messaging may not be relevant.</li> <li>• The PMF level is significantly greater than the 1% flood levels plus freeboard. Appendix B clearly shows the PMF is 2+m higher than the 1%AEP flood levels for Bow Bowing Creek. As such the buildings will be impacted in the event of a PMF event. The hazard category is H5 which means the buildings are at risk of structural damage.</li> </ul> | <ul style="list-style-type: none"> <li>• Evacuation routes will be cut firstly at road crossings.</li> <li>• SES issue regional warnings based on BOM and local conditions. Although not site specific we consider the warnings relevant for the project.</li> <li>• As noted building levels are RL 48.0m. The PMF level in Bow Bowing Creek and McBarry Creek are noted to be at or below the building level (ie Location 1 - 48.0m, Location 17 - RL47.5) and up to 0.5m higher on Culverston Road (Location 20 – 48.47m). It is agreed that the PMF levels are 2+m higher than the 1%, however extremely rare for this event to occur. Further in regard to structural damage, the requirement of consent (B15) is for the building design to be such that “<i>Any structures below the 1% Annual Exceedance Probability plus 500 mm of freeboard must be constructed from flood compatible building components.</i>” The building design meets acceptable flood requirements, per the BCA and conditions of consent.</li> </ul> |
| 32 | <p>Trigger 3.</p> <ul style="list-style-type: none"> <li>• By the time the flood level is at 3m there will be inadequate time to evacuate and Culverston Road may be cut off.</li> <li>• There are many possible critical events in the PMF.</li> <li>• Figure 5.3 shows that there is less than 0.35hr or 21 minutes from the start of the critical PMF event until H2 category (non trafficable by vehicles in Culverston Road). This is</li> </ul>                                                                                                                  | <ul style="list-style-type: none"> <li>• The points are noted.</li> <li>• On-site refuge is noted to be required following external evacuation routes being cut-off.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | insufficient time to evacuate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 33 | <p>Trigger 4.</p> <ul style="list-style-type: none"> <li>Too late to seek this during an event. The required actions should be built into this plan. Additional in an event of this magnitude the SES is going to be very busy elsewhere.</li> <li>These regional warning levels are unlikely to be specific enough for a small site in a relatively small catchment.</li> <li></li> </ul>                                                                                                                                                                                             | <p>The action is for on-site refuge to be undertaken until direction by SES is made.</p> <p>Refer previous comments regarding regional SES warnings.</p>                                                                                                                                                                                                                                                                                          |
| 34 | <ul style="list-style-type: none"> <li>This site is currently very flat (east to west) and does not represent this evacuation sequence. There is also at least 3 separate flood aspects to the site, any one of which may be critical in a real event. As there are located to the south, north/north-east and west of the site, it is considered that this approach is too simplistic.</li> <li>M5 to be replaced with M31</li> <li>Surely they can fit more than one in a car if evacuation is the safest option. If shelter in place is safe why is everyone evacuation.</li> </ul> | <ul style="list-style-type: none"> <li>The descriptions noted are general in nature. Reference to specific parts of the site have been removed to ensure the comments remain general for the occupants.</li> <li>M31 has been updated.</li> <li>The number of persons in a car is not specified and does not form part of the FERP. Evacuation would be made, or on-site refuge undertaken, as set out in earlier parts of the report.</li> </ul> |
| 37 | <ul style="list-style-type: none"> <li>Nothing in Appendix A</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                |

Best Regards,

**Mark Wilson**  
Director



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**From:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>  
**Sent:** Thursday, 10 February 2022 8:53 AM  
**To:** Mark Wilson <[Mark@costinroe.com.au](mailto:Mark@costinroe.com.au)>  
**Cc:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>; Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>  
**Subject:** SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan )

Hi Mark,

Cathy has reviewed the information submitted and has provided the following comments:

*It should be noted that Council's requirements for this site (and all sites in Campbelltown) is for any floor levels to be located above the 1% AEP flood level plus the appropriate freeboard. This FERP addresses flooding up to the PMF and this appears to be as a result of a SSD condition of consent, not set by Council.*

*Please note that I have reviewed this document only and none of the other documents referenced in the Plan.*

I have detailed the comments in the document in a table below, however, please review the comments in the context of the document submitted:

| Page | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6    | <ul style="list-style-type: none"> <li>Comment in B14 states pad levels are above the 1%, no levels have been given in the report. “infrastructure has no information on floor levels but has no reason to disbelieve the statement.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 9    | <ul style="list-style-type: none"> <li>The defined flow path along the northern side of Rose Peyton Dr is also located on the site.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 10   | <ul style="list-style-type: none"> <li>The Bow Bowing Creek AHD are RL47 AHD, not RL45 AHD.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 11   | <ul style="list-style-type: none"> <li>The floor level variance of 0.5m is a large variance. No issue if the proposed levels still comply with the performance criteria with respect to flooding 1%AEP + freeboard.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 13   | <ul style="list-style-type: none"> <li>2.6 discharge should be to Bow Bowing Creek wherever possible. Any flows excess of current discharges to other locations will require assessment and may require system upgrades.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 18   | <ul style="list-style-type: none"> <li>3.6 this document appears to cover more than just flooding. The development footprint is &gt;2,500m<sup>2</sup> and triggers the need to include water quality treatment as set out in Council’s Engineering Design Guide for Development. It is unclear if this has been included.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 24   | <ul style="list-style-type: none"> <li>Figure 4.3 it should be noted that the depths shown are in the adjacent channel which is why some locations show negative depths</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 31   | <ul style="list-style-type: none"> <li>None of the locations are upstream of the site. Further with the time to peak and real time data only updated every 15 minutes, such a system is unlikely to work.</li> <li>Detail on where the evacuation routes first cut off, this will be critical to evacuation timing and effectiveness.</li> <li>Would the SES issue site specific warnings or simply regional messaging, regional messaging may not be relevant.</li> <li>The PMF level is significantly greater than the 1% flood levels plus freeboard. Appendix B clearly shows the PMF is 2+m higher than the 1%AEP flood levels for Bow Bowing Creek. As such the buildings will be impacted in the event of a PMF event. The hazard category is H5 which means the buildings are at risk of structural damage.</li> </ul> |
| 32   | <p>Trigger 3.</p> <ul style="list-style-type: none"> <li>By the time the flood level is at 3m there will be inadequate time to evacuate and Culverston Road may be cut off.</li> <li>There are many possible critical events in the PMF.</li> <li>Figure 5.3 shows that there is less than 0.35hr or 21 minutes from the start of the critical PMF event until H2 category (non trafficable by vehicles in Culverston Road). This is insufficient time to evacuate.</li> </ul>                                                                                                                                                                                                                                                                                                                                                 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 33 | <p>Trigger 4.</p> <ul style="list-style-type: none"> <li>• Too late to seek this during an event. The required actions should be built into this plan. Additional in an event of this magnitude the SES is going to be very busy elsewhere.</li> <li>• These regional warning levels are unlikely to be specific enough for a small site in a relatively small catchment.</li> <li>•</li> </ul>                                                                                                                                                                                              |
| 34 | <ul style="list-style-type: none"> <li>• This site is currently very flat (east to west) and does not represent this evacuation sequence. There is also at least 3 separate flood aspects to the site, any one of which may be critical in a real event. As there are located to the south, north/north-east and west of the site, it is considered that this approach is too simplistic.</li> <li>• M5 to be replaced with M31</li> <li>• Surely they can fit more than one in a car if evacuation is the safest option. If shelter in place is safe why is everyone evacuation.</li> </ul> |
| 37 | <ul style="list-style-type: none"> <li>• Nothing in Appendix A</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

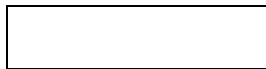
Please contact me for any further enquiries, I'm available Monday, Tuesday and Thursday.

**Ellise Mangion**

Senior Development Planner

P: 02 4645 4608  
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Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.

**From:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>  
**Sent:** Tuesday, 8 February 2022 9:28 AM  
**To:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>  
**Subject:** FW: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan)  
**Importance:** High

Hi Ellise

Please find attached comments on the FERP (also attached). Please note that I have reviewed this document only and none of the other documents referenced in the Plan.

It should be noted that Council's requirements for this site (and all sites in Campbelltown) is for any floor levels to be located above the 1% AEP flood level plus the appropriate freeboard. This FERP addresses flooding up to the PMF and this appears to be as a result of a SSD condition of consent, not set by Council.

Comments are offered as a commentary on the document as provided.

appy to discuss if necessary.

Kind regards

**Cathy Kinsey**

**Strategic Infrastructure and Transport Coordinator**

M: 0418 995 084  
E: [cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)  
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Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.

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**From:** Mark Wilson <[Mark@costinroe.com.au](mailto:Mark@costinroe.com.au)>  
**Sent:** Thursday, 20 January 2022 6:38 PM  
**To:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>  
**Cc:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>; Xavier Cure <[Xavier.Cure@costinroe.com.au](mailto:Xavier.Cure@costinroe.com.au)>; Justin Crameri <[jcrameri@texco.net.au](mailto:jcrameri@texco.net.au)>  
**Subject:** SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan)  
**Importance:** High

Cathy,

I spoke to you briefly regarding the SSD7500 MOD1 development at the above site late last year. I hope you had a great Christmas and new year.

We have prepared the Flood Emergency Response Plan (FERP) required to be included in the Construction Environmental Management Plan under Consent Condition B13 of SSD7500. The condition requires submission of and consultation with Council in relation to the plan.

We note the current plan covers the Stage 1 and 2 development. Stages 3 and 4 are not included in the submitted document.

Attached is the DRAFT FERP for comment. The plan covers all required items of the approval, and has been completed in accordance with the approved concept management plans and information provided by you and Catchment Simulation Solutions as part of the package.

The submission to the department will be made next week. I will call to discuss the FERP with you.

Note Condition B13 also requires consultation with SES and we are having some difficulty finding the relevant person to make the submission to and consultation – do you have contact details for this purpose?

Thanking you in advance for your assistance.

**Best Regards,**

**Mark Wilson**  
**Director**

Costin Roe Consulting Pty Ltd  
ABN 50 003 696 446

## **APPENDIX C**

### **Monthly Rainfall Data & Climate Statistics**



| Statistics                              | Jan  | Feb   | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Annual | Years | Plot | Map |
|-----------------------------------------|------|-------|------|------|------|------|------|------|------|------|------|------|--------|-------|------|-----|
| Temperature                             |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| Mean maximum temperature (°C)           | 30.1 | 28.8  | 26.8 | 23.9 | 20.6 | 17.7 | 17.4 | 19.0 | 22.4 | 24.8 | 26.6 | 28.5 | 23.9   | 23    |      |     |
| Mean minimum temperature (°C)           | 18.0 | 17.8  | 16.1 | 12.9 | 9.0  | 7.2  | 5.8  | 6.4  | 9.3  | 11.8 | 14.4 | 16.2 | 12.1   | 23    |      |     |
| Rainfall                                |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| Mean rainfall (mm)                      | 73.7 | 119.2 | 84.8 | 69.5 | 42.7 | 72.6 | 39.5 | 38.2 | 37.1 | 61.1 | 76.1 | 63.6 | 748.4  | 22    |      |     |
| Decile 5 (median) rainfall (mm)         | 64.2 | 92.2  | 60.8 | 58.0 | 21.6 | 52.0 | 26.0 | 26.6 | 26.2 | 48.7 | 57.2 | 61.4 | 714.7  | 23    |      |     |
| Mean number of days of rain $\geq 1$ mm | 7.6  | 7.2   | 8.1  | 6.7  | 5.1  | 6.2  | 5.1  | 4.0  | 4.8  | 5.8  | 7.0  | 6.9  | 74.5   | 23    |      |     |
| Other daily elements                    |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| Mean daily sunshine (hours)             |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| Mean number of clear days               |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| Mean number of cloudy days              |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| 9 am conditions                         |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| Mean 9am temperature (°C)               | 22.0 | 21.5  | 19.4 | 17.5 | 13.8 | 11.1 | 10.3 | 12.0 | 15.6 | 18.1 | 19.2 | 20.9 | 16.8   | 13    |      |     |
| Mean 9am relative humidity (%)          | 73   | 77    | 81   | 76   | 77   | 80   | 78   | 70   | 65   | 61   | 70   | 71   | 73     | 13    |      |     |
| Mean 9am wind speed (km/h)              | 10.1 | 9.7   | 8.9  | 10.5 | 10.7 | 10.3 | 10.8 | 11.7 | 12.2 | 12.5 | 11.8 | 10.7 | 10.8   | 13    |      |     |
| 9am wind speed vs direction plot        |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| 3 pm conditions                         |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |
| Mean 3pm temperature (°C)               | 28.2 | 27.1  | 25.3 | 22.2 | 19.2 | 16.6 | 16.1 | 17.8 | 20.8 | 22.5 | 24.2 | 26.5 | 22.2   | 13    |      |     |
| Mean 3pm relative humidity (%)          | 49   | 53    | 54   | 53   | 52   | 55   | 50   | 42   | 42   | 45   | 50   | 48   | 49     | 13    |      |     |
| Mean 3pm wind speed (km/h)              | 19.4 | 17.0  | 14.8 | 14.4 | 13.0 | 12.9 | 13.9 | 16.1 | 18.1 | 19.8 | 19.5 | 19.9 | 16.6   | 13    |      |     |
| 3pm wind speed vs direction plot        |      |       |      |      |      |      |      |      |      |      |      |      |        |       |      |     |

## HORSLEY PARK EQUESTRIAN CENTRE AWS

### Mean rainfall (mm)

#### Site details

Site name: HORSLEY PARK EQUESTRIAN CENTRE A  
Latitude: 33.85 °S

Longitude: 150.86 °E

Site number: 067119  
Elevation: 100 m

Commenced: 1997  
Operational status: Still Open

#### Yearly data

#### 30 year statistics

#### Comparison site

#### First statistic

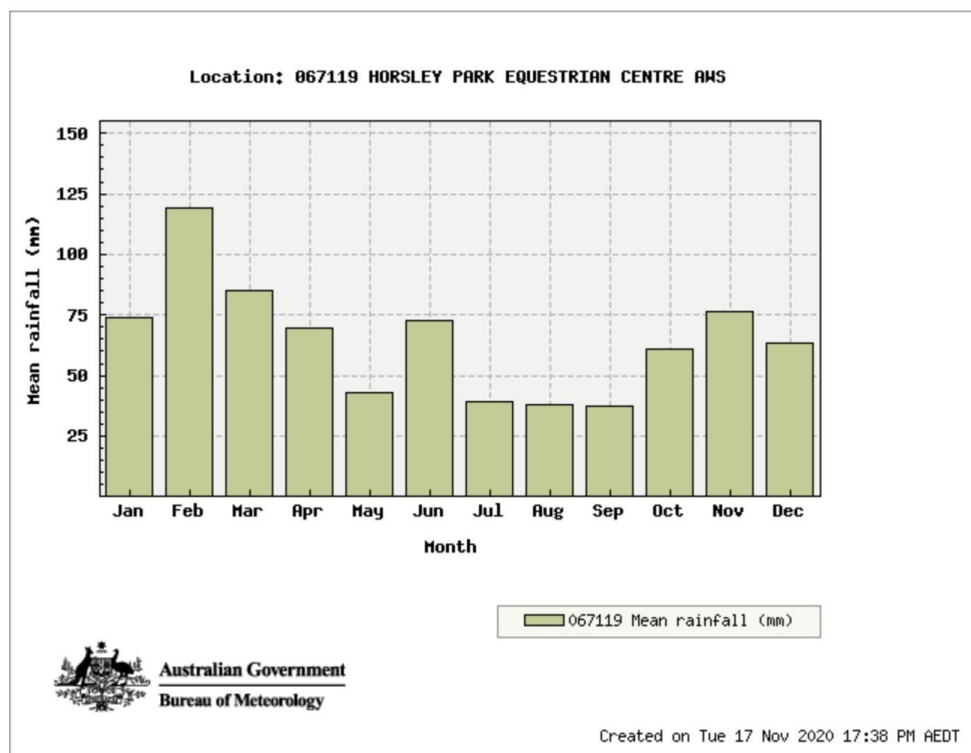
#### Second statistic

Note: Only one option can be redrawn at a time

Include data for the year:

2020

Redraw



| Statistics                                | Jan  | Feb   | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Annual | Years |
|-------------------------------------------|------|-------|------|------|------|------|------|------|------|------|------|------|--------|-------|
| Mean rainfall (mm) for years 1997 to 2020 | 73.7 | 119.2 | 84.8 | 69.5 | 42.7 | 72.6 | 39.5 | 38.2 | 37.1 | 61.1 | 76.1 | 63.6 | 778.1  | 23    |

12.3 = Not quality controlled

Page created: Tue 17 Nov 2020 17:38:15 PM AEDT

## **APPENDIX D**

# **OPERATIONAL STORMWATER MAINTENANCE PLAN**

## 1 MAINTENANCE AND MONITORING

### 1.1 Introduction

It is important that each component of the water quantity measures, and water quality treatment train is properly operated and maintained. These need to be considered through the life cycle of the whole of the development. In order to achieve the design treatment objectives, a maintenance schedule has been prepared (refer to **Table D.1** below).

Note that inspection frequency may vary depending on site specific attributes and rainfall patterns in the area. In addition to the maintenance requirements below it is also recommended that inspections are made following heavy rainfall or major storm events. Event heavy rain inspections should be carried out as soon as practicable following an intense period of rainfall, (i.e. greater than 100mm over 48 hours), as measured at Horsley Park Weather Station No. 67119.

The maintenance requirements and schedule set out in this document are for the permanent drainage systems which will be required for the operational phase of the estate (i.e. after roads, buildings and final stormwater measures are constructed and occupied). The information in this appendix is provided subject to the provision of a future operational SMP for the whole of the development.

### 1.2 Types of Maintenance

Water Sensitive Urban Design (WSUD) assets require both proactive and reactive maintenance to ensure long term system health and performance.

Proactive maintenance refers to regular scheduled maintenance tasks, whereas reactive maintenance is required to address unscheduled maintenance issues. If an asset is not functioning as intended, then rectification may be required to restore the asset back to its intended functionality.

The preferred and recommended approach is for proactive maintenance.

#### Proactive Maintenance

Proactive maintenance is a set of scheduled tasks to ensure that the WSUD asset is operating as designed.

Proactive maintenance involves:

- Regular inspections of the WSUD asset;
- Scheduled maintenance tasks for issues that are known to require regular attention (e.g. litter removal, weed control); and
- Responsive maintenance tasks following inspections for issues which require irregular attention (e.g. sediment removal, mulching, and scour management).

Proactive maintenance in the first two years after the establishment period (construction and planting phases) are the most intensive and important to the long-term success of the treatment asset.

Proactive maintenance is a cost-effective means of reducing the long-term costs associated with operating stormwater treatment assets.

Maintenance activities specific to each WSUD asset type are detailed in the inspection and maintenance schedules and checklists provided in the report. The frequency of scheduled maintenance depends on the asset type and the issue being managed.

As a general guide, scheduled maintenance activities should be completed on a three to four-month cycle. The checklists provided should be used as a minimum guide to scheduled maintenance tasks and should be amended to suit site conditions and maintenance requirements.

Treatment assets should also be inspected at least once a year during or immediately after a significant rainfall event. This is important to confirm that the treatment system is functioning correctly under wet conditions.

A higher level of scheduled maintenance may be arranged for some treatment assets. This is often the case for treatment assets which are located in high profile locations (e.g. streetscapes and parklands), and where public amenity is considered to be a high priority. In these cases, a more frequent maintenance regime may be required to remove litter and weeds and to ensure vegetation health and cover is maintained to a high level.

### Reactive Maintenance

Reactive maintenance is undertaken when a problem or fault is identified that is beyond the scope of proactive maintenance. Reactive maintenance may occur following a complaint about the WSUD asset (e.g. excessive odours or litter). Reactive maintenance often requires a swift response and may involve specialist equipment or skills.

### Rectification

Rectification of a WSUD asset is undertaken when the system is not functioning as intended, and proactive and reactive maintenance activities are unable to return the asset to functional condition.

The lack of functional performance and therefore failure of a stormwater treatment asset may be related to many factors including inappropriate design, poor construction, and lack of regular maintenance or end of life cycle. In many cases, the design of assets has not included adequate consideration of the maintenance requirements, in terms of the system's ability to cope with catchment pollutant loads (i.e. sediments) and the frequency of maintenance required to maintain the system at a functional level.

Maintenance planning at the design phase is therefore crucial to both the long-term operating costs and the expected life cycle of the treatment system. In general, the expected lifecycle of a stormwater treatment asset (e.g. a bio-retention system) that has been well designed and constructed and is regularly maintained should be at least 15-20 years.

However, the lifecycle for each treatment system will be different and related to:

- whether the system has been designed, constructed and maintained according to best practice;

- catchment characteristics (influences the quality of the stormwater);
- the age and general health of the system; and
- the type of plants that have been used in the system.

Regular asset condition assessments should be undertaken to monitor the system condition and to inform where an asset is in terms of its expected lifecycle. Renewal of a system refers to replacing the main elements of the system including:

- infrastructure;
- removing deposited sediment, removing and replacing the topsoil (or filter media in the case of a bio-retention system) and profiling the topsoil level back to the design levels;
- re-planting; and
- pavement and sub-layers (in the case of permeable pavements).

A WSUD specialist may be required to assess whether a treatment system has reached the end of its life cycle and to provide advice on the renewal works.

Asset condition assessments can also identify assets that need to be rectified. The decision to continue with an increased maintenance regime or to rectify an asset, and over what timeframe, can be a difficult one to make. This is because certain maintenance items are more important to overall system function than others. For example, extended ponding on the surface of a bio-retention system or persistent scouring of a swale should be addressed more rapidly than recurrent weed problems.

### **1.3 Routine Inspections and Maintenance Schedule for General Stormwater System**

Routine inspections are to be carried out to assess the need for maintenance and are primarily concerned with checking the functionality of the stormwater drainage facilities; items such as drains, drainage pits, box culverts, detention tanks and rainwater reuse tank systems. Maintenance of these items is vitally important for the ongoing drainage and treatment of stormwater.

Should the inspection reveal that maintenance of any item is required, this is to be reported to the building management for action.

Items that are to be subject to Routine Inspections for Maintenance may comprise, but not be limited to those listed in the table below. This table is to be read in conjunction with the Stormwater design drawings.

It is vitally important that each component of the stormwater system is properly operated and maintained. In order to achieve the modelled and design treatment outcomes, a maintenance schedule has been prepared (below) to assist in the effective operation and maintenance of the various drainage and water quality components.

**Table D.1. Maintenance Schedule**

| MAINTENANCE ACTION                                                                                                       | FREQUENCY                              | RESPONSIBILITY                | PROCEDURE                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>SWALES/ LANDSCAPED AREAS</b>                                                                                          |                                        |                               |                                                                                                                    |
| Check density of vegetation and ensure minimum height of 150mm is maintained. Check for any evidence of weed infestation | Six monthly                            | Maintenance Contractor        | Replant and/or fertilise, weed and water in accordance with landscape consultant specifications                    |
| Inspect swale for excessive litter and sediment build up                                                                 | Six monthly                            | Maintenance Contractor        | Remove sediment and litter and dispose in accordance with local authorities' requirements.                         |
| Check for any evidence of channelisation and erosion                                                                     | Six monthly/<br>After Major Storm      | Maintenance Contractor        | Reinstate eroded areas so that original, designed swale profile is maintained                                      |
| Weed Infestation                                                                                                         | Three Monthly                          | Maintenance Contractor        | Remove any weed infestation ensuring all root ball of weed is removed. Replace with vegetation where required.     |
| Inspect swale surface for erosion                                                                                        | Six Monthly                            | Maintenance Contractor        | Replace top soil in eroded area and cover and secure with biodegradable fabric. Cut hole in fabric and revegetate. |
| <b>VORTECH GPT</b>                                                                                                       |                                        |                               |                                                                                                                    |
| Refer O&M Manuel in <b>Appendix E.</b>                                                                                   | Refer O&M Manuel in <b>Appendix E.</b> | Maintenance Contractor/ Owner | Refer O&M Manuel in <b>Appendix E.</b>                                                                             |
| <b>RAINWATER TANKS</b>                                                                                                   |                                        |                               |                                                                                                                    |
| Check for any clogging and blockage of the first flush device                                                            | Monthly                                | Maintenance Contractor        | First flush device to be cleaned out                                                                               |
| Check for any clogging and blockage of the tank inlet - leaf/litter screen                                               | Six monthly                            | Maintenance Contractor        | Leaves and debris to be removed from the inlet leaf/litter screen                                                  |
| Check the level of sediment within the tank                                                                              | Every two years                        | Maintenance Contractor        | Sediment and debris to be removed from rainwater tank floor if sediment level is greater than the                  |



| MAINTENANCE ACTION                                        | FREQUENCY                          | RESPONSIBILITY         | PROCEDURE                                                                                                               |
|-----------------------------------------------------------|------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                                                           |                                    |                        | maximum allowable depth as specified by the hydraulic consultant                                                        |
| <b>INLET &amp; JUNCTION PITS</b>                          |                                    |                        |                                                                                                                         |
| Inside of pits                                            | Six Monthly                        | Maintenance Contractor | Remove grate and inspect internal walls and base, repair where required. Remove any collected sediment, debris, litter. |
| Outside of pits                                           | Four Monthly/<br>After Major Storm | Maintenance Contractor | Clean grate of collected sediment, debris, litter and vegetation.                                                       |
| <b>STORMWATER SYSTEM</b>                                  |                                    |                        |                                                                                                                         |
| General Inspection of complete stormwater drainage system | Bi-annually                        | Maintenance Contractor | Inspect all drainage structures noting any dilapidation in structures and carry out required repairs.                   |

## **APPENDIX E**

### **VORTECH OPERATION & MAINTENANCE MANUAL**



Vortechs

Operations & Maintenance Manual

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## Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways, maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site. This manual has been designed to provide details on the cleaning and maintenance processes as recommended by the manufacturer.

The Vortechs system is a high-performance hydrodynamic separator that effectively removes fine sediment, oil and grease, as well as floating and sinking pollutants. Its swirl concentrator and flow control features, work together to minimise turbulence and provide stable storage of captured pollutants. The design also allows for easy inspection and unobstructed maintenance access.

### Why do I need to perform maintenance?

Adhering to the maintenance schedule of each stormwater treatment device is essential to ensuring that it works properly throughout its design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It's also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up).

## Health and Safety

Access to a Vortechs unit requires removing heavy access covers/grates, additionally it might become necessary to enter into a confined space. Pollutants collected by the Vortechs will vary depending on the nature of your site. There is potential for these materials to be harmful. For example, sediments may contain heavy metals, carcinogenic substances or objects such as broken glass and syringes. For these reasons, all aspects of maintaining and cleaning your Vortechs require careful adherence to Occupational Health and Safety (OH&S) guidelines.

It is important to note that the same level of care needs to be taken to ensure the safety of non-work personnel, as a result it may be necessary to employ traffic/pedestrian control measures when the device is situated in, or near areas with high vehicular/pedestrian activity.

### Personnel health and safety

Whilst performing maintenance on the Vortechs, precautions should be taken in order to minimise (or, when possible, prevent) contact with sediment and other captured pollutants by maintenance personnel. In order to achieve this the following personal protective equipment (PPE) is recommended:

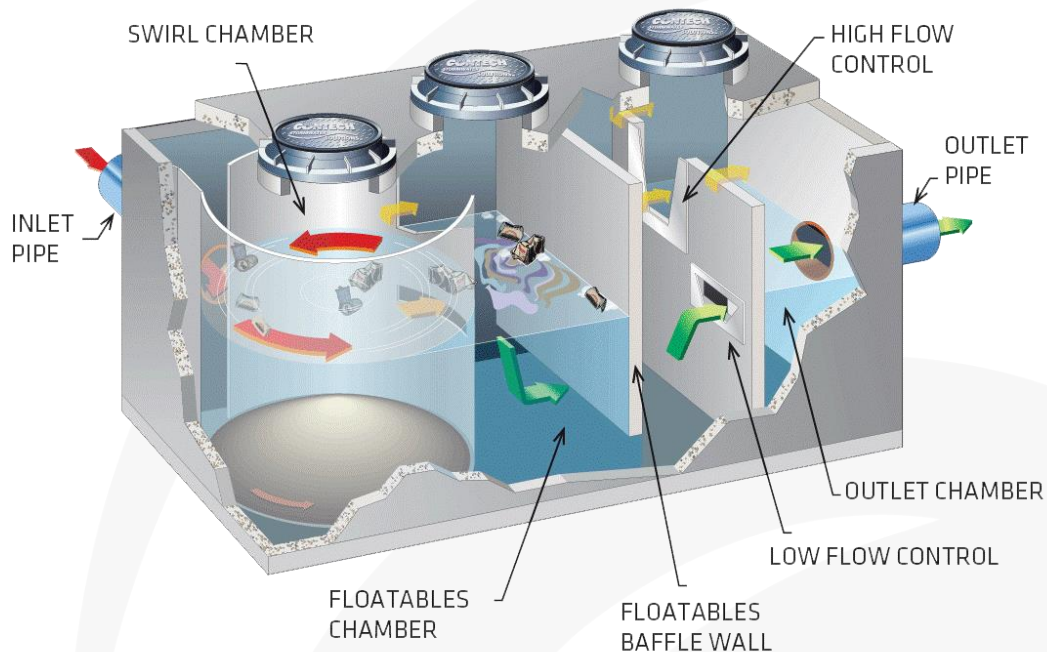
- Puncture resistant gloves
- Steel capped safety boots
- Long sleeve clothing, overalls or similar skin protection
- Eye protection
- High visibility clothing or vest

During maintenance activities, it may be necessary to implement traffic control measures. Ocean Protect recommend that a separate site specific traffic control plan is implemented as required to meet the relevant governing authority guidelines.

Whilst the minor maintenance for the Vortechs can be performed from surface level, there may be a need to enter the pit (confined space) during major services. It is recommended that all maintenance personnel evaluate their own needs for confined space entry and compliance with relevant industry regulations and guidelines. Ocean Protect maintenance personnel are fully trained and carry certification in confined space entry requirements.

## How does it Work?

Stormwater enters the swirl chamber at a tangent, creating a swirling flow pattern and enhancing gravitational separation. Sinking pollutants stay in the swirl chamber while floating pollutants are stopped at the floatables baffle wall. During larger storms, the water level rises above the low flow control and begins to flow through the high flow control.



As a storm event increases in intensity, the swirling action increases proportionately, this assists in the prevention of re-suspension. When flowing at peak capacity, the water surface in the system approaches the top of the high flow control. The Vortechs should be sized so that previously captured pollutants are retained in the system even during these infrequent events. As a storm subsides, treated runoff decants out of the Vortechs system at a controlled rate, restoring the water level to a dry-weather level equal to the invert of the inlet and outlet pipes.

## Maintenance Procedures

To ensure optimal performance, it is advisable that regular maintenance is performed. Typically, the Vortechs requires a minor service every 6 months and a major service every 12 months.

### Primary Types of Maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the Vortechs.

|               | Description of Typical Activities                                                                                                  | Frequency    |
|---------------|------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Minor Service | Visual inspection of swirl, floatables and outlet chambers<br>Removal of large floatable pollutants<br>Measuring of sediment depth | At 6 Months  |
| Major Service | Removal of accumulated sediment and gross pollutants<br>Inspection of the swirl chamber, baffle wall and outlet controls           | At 12 Months |



Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

### Minor Service

This service is designed to assess the condition of the device and record necessary information that will inform the activities to be undertaken during a major service.

1. Establish a safe working area around the access point
2. Remove access cover over the swirl chamber
3. Visually inspect the chamber
4. Remove large floatable pollutants with a net
5. Measure and record sediment depth
6. Replace access cover
7. Repeat steps 2-6 for floatable and outlet chambers

### Major Service

This service is designed to return the Vortechs device back to optimal operating performance.

1. Establish a safe working area around the access point
2. Remove access cover over the swirl chamber
3. Using a vacuum unit remove any floatable pollutants
4. Decant water until water level reaches accumulated sediment
5. Remove accumulated sediment and gross pollutants with vacuum unit (if required)
6. Repeat steps 2-5
7. Inspect the swirl chamber, baffle wall and outlet controls
8. Use high pressure water to clean sump area (if required)
9. Replace access covers

When determining the need to remove accumulated sediment from the Vortechs unit, the specific sediment storage capacity for the size of unit should be considered (see table below).

| Vortechs Model | Swirl Chamber Diameter (m) | Sediment Storage Capacity (m <sup>3</sup> ) |
|----------------|----------------------------|---------------------------------------------|
| VX1000         | 0.9                        | 0.5                                         |
| VX2000         | 1.2                        | 0.9                                         |
| VX3000         | 1.5                        | 1.4                                         |
| VX4000         | 1.8                        | 1.8                                         |
| VX5000         | 2.1                        | 2.4                                         |
| VX7000         | 2.4                        | 3.1                                         |
| VX9000         | 2.7                        | 3.7                                         |
| VX11000        | 3.0                        | 4.3                                         |
| VX16000        | 3.7                        | 5.4                                         |

## Additional Types of Maintenance

The standard maintenance approach is designed to work towards keeping the Vortechs operational during normal conditions. From time to time, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

### Hazardous Material Spill

If there is a spill event on site, the Vortechs unit that potentially received flow should be inspected and cleaned. Specifically, all captured pollutants and liquids from within the unit should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event.

### Blockages

In the unlikely event that flooding occurs upstream of the Vortechs system, the following steps should be undertaken to assist in diagnosing the issue and determining the appropriate response.

1. Inspect the upstream diversion structure (if applicable) ensuring that it is free of debris and pollutants
2. Decant water from Vortechs unit in preparation for confined space entry
3. Inspect the high flow and low flow control elements as well as both inlet and outlet pipes for obstructions, if present remove any built up pollutants or blockages.

### Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the Vortechs after a major storm event. The focus is to inspect for higher than normal sediment accumulation that may result from localised erosion, where necessary accumulated pollutants should be removed and disposed.

### Disposal of Waste Materials

The accumulated pollutants found in the Vortechs must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. If the system has been exposed to any hazardous or unusual substance, there may be additional special handling and disposal methods required to comply with relevant government/authority/industry regulations.

## Maintenance Services

With over a decade and a half of maintenance experience Ocean Protect has developed a systematic approach to inspecting, cleaning and maintaining a wide variety of stormwater treatment devices. Our fully trained and professional staff are familiar with the characteristics of each type of system, and the processes required to ensure its optimal performance.

Ocean Protect has several stormwater maintenance service options available to help ensure that your stormwater device functions properly throughout its design life. In the case of our Vortechs system we offer long term pay-as-you-go contracts and pre-paid once off servicing.

For more information please visit [www.OceanProtect.com.au](http://www.OceanProtect.com.au)

**APPENDIX F**  
**CONSTRUCTION SOIL AND WATER MANAGEMENT PLAN**

## F1 CONSTRUCTION SOIL AND WATER MANAGEMENT PLAN

### F1.1 General Requirements

Management of Soils and water is required to be maintained during the construction phase of the development, or the site being suitably stabilised to prevent erosion and sediment discharge and to maintain existing site runoff from the development site. **Appendix F** is to be read in conjunction with **Section 8** of this SMP, and the CEMP.

As part of the construction phase, the key measure of stormwater management will be completion of soil and water management as per the guidelines of the Landcom document *Managing Urban Stormwater, Soils and Construction (1998) – The Blue Book*.

The quality of discharge from the site to satisfy the following Water Quality Objectives (WQOs) per Landcom Blue Book requirements:

- Water Ph released from a controlled sediment basin outflow shall be within the range 6.5 to 8.5.
- Suspended Solids released from controlled sediment basin outflows will be no greater than 50mg/L, 75 NTU's (Nephelometric Turbidity Units) or other Turbidity measurement based on confirmed laboratory correlation. Correlation should be confirmed through laboratory assessment and in consultation with the CPESC.
- Oils and Grease – no visible films or odour.
- Litter – no visible litter washed or blown from the site.

### F1.2 Management Phases During Construction

#### Background

The CSWMP employs an ESCP which will be implemented to minimise water quality impacts in terms of sediment loading. The ESCP drawings are included in **Appendix A**. The plan includes measures such as sediment fences, cut-off drains for sediment laden stormwater and diversion channels for clean stormwater run-off.

The following sections provide information to identify controls and procedures that will be incorporated into the *Erosion and Sediment Control* program.

It is expected that the construction period will be more than 6 months.

#### Pre-Construction

The following minimum requirements will be met prior to commencement of construction:

- Sediment fences will be in accordance with *Blue Book Standard drawing SD 6-8* and constructed in locations specified on drawings, and on the upstream edges of the designated buffer strips and at the base of fill embankments.

- Areas for plant and construction material storage will be designated along with associated drains and spillage holding ponds and any contaminated soil management measures required of the CMP. These areas will remain separate to the CSWMP measures and detailed per the CEMP. Reference to the CEMP will be made pertaining to construction specific management measures and spill procedures.
- Diversion banks (and/ or drains) will be created at the upstream boundaries of construction activities to ensure upstream runoff is diverted around any exposed areas. These diversion banks (and/ or drains) will be sufficiently stable to not contribute sediment or sediment laden water off-site. Catch drains will be created at the downstream boundary of construction activities.
- Rock check dams and/or gravel bags or sandbags will be placed along the catch drains to slow flow, reduce scour and capture some sediment from internal site water runoff. Refer to drawings for recommended locations.
- Construction of temporary sediment basins will be completed.
- Site personnel will be educated to the sediment and erosion control measures implemented on site.
- Sediment basins will be flocculated prior to any run off being received. An acceptable method is for water to be treated with gypsum at approximately 32 kg per 100m<sup>3</sup> of collected runoff, or as required to achieve the specified water quality targets.
- All exposed soils should be stabilised within 5 days of completion. Acceptable method would be to use a soil binder such as Ground Control (Complete Water Treatment), Stonewall (Vital Industries) or approved equivalent as noted.
- Concrete crushing plant, washout and other construction related activity to be self-contained and managed through construction specific management measures and spill procedures including in the CEMP.
- Stockpile management to be completed as set out in ESCP (**Appendix A**).

#### During Construction

The following minimum requirements will be met during construction:

- Progressive re-vegetation of filled (unpaved) areas and filled batters. Paved areas are to be stabilised in accordance with this CSWMP.
- Construction activities will be confined to the necessary construction areas.
- The provision of a stabilised site access to minimise the tracking of debris from tyres of vehicles leaving the site onto public roads. Construction exits will be nominated to manage the movement of construction access to defined locations. Refer to *Blue Book Standard Drawing SD 6-14*.

- Topsoil and temporary stockpile location will be nominated to coincide with areas already disturbed. Stockpiles will be sealed with soil binder within 20 days. A sediment fence will be constructed around the downstream side of the stockpile and a diversion drain at the upstream side if required.
- Regular inspection and maintenance of sediment fences, sediment basins and other erosion control measures will be made. Following rainfall events greater than 5mm inspection of erosion control measures and removal of collected material will be undertaken. Replacement of any damaged measures will be performed immediately.

Site shutdowns are conducted in a manner that minimises potential environmental harm:

- Existing ground covers are protected from damage and retained as long as practicable.
- Procedures for initiating a long-term site shutdown (e.g. between completion of earthworks and building works) incorporate appropriate revegetation or approved stabilisation of all soil disturbances unless otherwise stipulated within an approved site management plan.
- Stabilisation procedures associated with a programmed site shutdown commence at least 30 days prior to the nominated shutdown time.
- Appropriate stabilisation measure to be undertaken for short-term site shutdown (e.g. long weekend, Christmas, Easter) will be in accordance with measures set out in this CSWMP and in consultation with the CPESC.
- The adopted site stabilisation measures will not rely upon the longevity of non-vegetated erosion control blankets and short-term soil binders.

Soil erosion resulting from rainfall is minimised:

- Soil disturbing activities are programmed to minimise periods of soil exposure.
- Progressive stabilisation will be undertaken following construction and earthworks.
- Appropriate additional measures will be considered and implemented in high risk areas (including batter slopes, temporary work areas, works adjacent to riparian zones, or other sensitive areas) as required during the construction period.

Soil erosion resulting from wind erosion is minimised:

- Erosion control measures used to control wind erosion are commensurate with soil exposure and the expected wind conditions in terms of speed and direction. Refer dust control notes ESCP in **Appendix A**.
- Stockpiles of erodible material (including loosely compacted or granular materials) are covered during periods of strong wind or when strong winds are imminent. Reference to Blue Book Standard drawing SD4-1 will be made pertaining to stockpile requirements including local provisions, covering and stabilisation requirements (refer also *Table 7-1*

of *Blue Book*). Specific measures for stockpile stabilisation include wetting of surfaces & application of polymer binders. As a minimum, completed work surfaces should be compacted and free of excessive loose sediment.

#### Post Construction

Post construction, maintenance of all erosion and sediment controls are required until permanent stabilisation has occurred.

## **F2 SOIL AND WATER MANAGEMENT PLAN**

Erosion and Sediment Control Plans (ESCP) are included in **Appendix A** to support this CSWMP. These plans show the works can proceed without polluting receiving waters.

### **F2.1 General Conditions**

1. The CSWMP is to be read in conjunction with the engineering plans, ESCP, and any other plans or written instructions that may be issued by the site manager, council inspector or other authorised representative in relation to development at the subject site.
2. Contractors will ensure that all soil and water management works are undertaken as instructed in this report and constructed following the guidelines stated in the Landcom document *Managing Urban Stormwater, Soils and Construction (1998) – The Blue Book* and Campbelltown City Council's specifications.
3. All subcontractors will be informed by the site manager of their responsibilities in minimising the potential for sedimentation and soil erosion.

### **F2.2 Land Disturbance**

1. Where practicable, the soil erosion hazard on the site will be kept as low as possible and as recommended in **Table F.1**.



**Table F.1. Limitations to access**

| <b>Land Use</b>               | <b>Limitation</b>                                                                                                          | <b>Comments</b>                                                                                                                                                                    |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction areas            | Limited to 5 (preferably 2) metres from the edge of any essential construction activity as shown on the engineering plans. | All site workers will clearly recognise these areas that, where appropriate, are identified with barrier fencing (upslope) and sediment fencing (downslope), or similar materials. |
| Temporary construction access | Limited to a maximum width of 5 metres                                                                                     | The site manager will determine and mark the location of these zones onsite. All site workers will comply with these restrictions.                                                 |
| Remaining lands               | Entry prohibited except for essential management works                                                                     |                                                                                                                                                                                    |

### **F2.3 Erosion & Sediment Control Conditions**

1. Clearly visible barrier fencing shall be installed as shown on ESCP drawings and elsewhere at the discretion of the site superintendent to ensure traffic control and prohibit unnecessary site disturbance. Vehicular access to the site shall be limited to only those essential for construction work and they shall enter the site only through the stabilised access points.
2. Soil materials will be replaced in the same order they are removed from the ground. It is particularly important that all subsoils are buried and topsoils (landscaped areas only) remain on the surface at the completion of works.
3. The construction program should be scheduled so that period of time from starting land disturbance to stabilisation is minimised.
4. Notwithstanding this, schedule works so that the duration from the conclusion of land shaping to completion of final stabilisation is less than 20 working days.
5. Land recently established with grass species will be watered regularly until an effective cover has properly established and plants are growing vigorously. Further application of seed might be necessary later in areas of inadequate vegetation establishment.
6. Where practical, foot and vehicular traffic will be kept away from all recently established areas
7. Earth batters shall be constructed in accordance with the Geotechnical Engineers Report or with as low a gradient as practical but not steeper than:
  - 2H:1V where slope length is less than 7 metres
  - 2.5H:1V where slope length is between 7 and 10 metres
  - 3H:1V where slope length is between 10 and 12 metres
  - 4H:1V where slope length is between 12 and 18 metres
  - 5H:1V where slope length is between 18 and 27 metres
  - 6H:1V where slope length is greater than 27 metres

8. All earthworks, including waterways/drains/spillways and their outlets, will be constructed to be stable in at least the design storm event of 1 in 10 year ARI (Q10).
9. During windy weather, large, unprotected areas will be kept moist (not wet) by sprinkling with water to keep dust under control. In the event water is not available in sufficient quantities, soil binders and/or dust retardants will be used or the surface will be left in a cloddy state that resists removal by wind.
10. Unprotected slope lengths will not exceed an LS-Factor of 0.27 and nominal values as noted below (per *Blue Book Table A1*):
  - i. 300m at 1%
  - ii. 80m at 1.5%
  - iii. 30m at 2%
  - iv. 12m at 3%
  - v. 5m at <6%
  - vi. All slopes >6% to be stabilised.

#### **F2.4 Pollution Control Conditions**

1. Stockpiles will not be located within 5 metres of hazard areas, including likely areas of high velocity flows such as waterways, paved areas and driveways.
2. Sediment fences will:
  - a) Be installed where shown on the drawings, and elsewhere at the discretion of the site superintendent to contain the coarser sediment fraction (including aggregated fines) as near as possible to their source.
  - b) Have a catchment area not exceeding 720 square metres, a storage depth (including both settling and settled zones) of at least 0.6 metres, and internal dimensions that provide maximum surface area for settling, and
  - c) Provide a return of 1 metre upslope at intervals along the fence where catchment area exceeds 720 square meters, to limit discharge reaching each section to 10 litres/second in a maximum 20 year  $t_c$  discharge.
3. Sediment removed from any trapping device will be disposed of in locations where further erosion and consequent pollution to down slope lands and waterways will not occur.
4. Water will be prevented from directly entering the permanent drainage system unless it is relatively sediment free (i.e. the catchment area has been permanently landscaped and/or likely sediment has been treated in an approved device). Nevertheless, stormwater inlets will be protected.
5. Temporary soil and water management structures will be removed only after the lands they are protecting are fully stabilised.

## F2.5 Site rehabilitation

1. All disturbed areas will be suitably stabilised per **Table F.2** in the number of days noted, or prior to anticipated rainfall, whichever is the greater, from completion of formation.

**Table F.2. Stabilisation Requirements**

| <b>Lands</b>                                                                 | <b>Max. C-factor</b> | <b>Max. No. Days</b>          |
|------------------------------------------------------------------------------|----------------------|-------------------------------|
| Waterways and other areas subjected to concentrated flows, post construction | 0.05                 | 10 working days               |
| Stockpiles, post construction                                                | 0.10                 | 10 workings days              |
| All lands, including waterways and stockpiles, during construction           | 0.15                 | 20 working days of inactivity |
| Placed fill must be stabilised if not worked on for more than 10 days        | 0.10                 | 10 working days of inactivity |

2. A minimum C-factor of 0.1 will be achieved on all non-completed earthworks exposed to accelerated soil erosion if further construction activities or soil disturbances are likely to be suspended for more than 20 days.
3. No completed earthwork surface will remain denuded for longer than 60 days.
4. The type of ground cover or stabilisation applied to completed earthworks will be compatible with the anticipated long-term land use, environmental risk, and site rehabilitation measures.
5. Unless otherwise directed by the Site Supervisor or where directed by the approved revegetation plan, topsoil will be placed at a minimum depth of 75mm on slopes 4:1 (H:V) or flatter, and 50mm on slopes steeper than 4:1.
6. The pH level (soil:water 1:5) of topsoil will be adequate to enable establishment and growth of the specified vegetation.
7. Soil ameliorants will be added to the soil in accordance with the approved landscape/revegetation plans and/or soil analysis.
8. Soil density/compaction will be adjusted prior to seeding/planting in accordance with the approved VMP.
9. Temporary site stabilisation procedures must commence at least 30 days prior to the nominated site shutdown date. At least 70% stable cover (C-factor less than 0.05) of all unstable and/or disturbed soil surfaces will be achieved prior to the start of shutdown. The stabilisation works will not rely upon the longevity of non-vegetated erosion control blankets, or temporary soil binders unless appropriate management measures to ensure the required C-Factor can be achieved throughout the duration of the measure's implementation.
10. All unstable or disturbed soil surfaces will be adequately stabilised against erosion as follows:

*“Land disturbance and land filling activities must be undertaken:*

- a) *In a phased manner,*
- b) *With no disturbance (including vegetation clearing) of another area (other than the construction of erosion & sediment control measures and associated drainage for the separation of clean and dirty water) until:*

- i. A C-Factor of 0.1 has been achieved on the previous phase, and;
- ii. At least 75% of the permanent stabilisation works have been implemented for the previous phase, and;
- iii. At least 95% of all the permanent stabilisation works on any other previously disturbed area have been implemented.”

Proposed methods of site stabilisation are set out in Table A3 of the *Landcom Bluebook* to achieve a C-Factor of less than 0.1.

The C-factor, is a ratio which defines soil cover – “the ratio of soil loss from land under specified plant or mulch condition to the corresponding loss from bare soil”.

Acceptable methods to stabilise per *Landcom Blue Book* and to meet the C-factor less than 0.1 are as follows and *Blue Book Table A3*:

- Where warehousing is proposed, constructed pavements/ buildings more than 75% of area (
  - Where warehousing is not proposed:
    - 70% grass cover over the disturbed area.
    - Wood chip at 27 t/Ha
    - 100mm recycled concrete road base.
    - Jute-matting
    - Hydromulching.
    - In-situ cement stabilisation/ lime stab.
    - soil binder such as Ground Control (Complete Water Treatment), Stonewall (Vital Industries). The use of polymer soil binders will be subject to on-site testing and verification, and confirmation of longevity and suitability of the application and specific location. It is expected that maintenance and ongoing re-application will be required if this method is adopted.
    - Other stabilisation per *Landcom Blue Book Table A3* as shown on drawing.
11. Construction-stage sediment control basins shall be decommissioned following completion of the civil works within the associated basin sub-catchment.

## F2.6 Waste Management Conditions

Acceptable bind will be provided for any concrete and mortar slurries, paints, acid washings, lightweight waste materials and litter. Clearance services are to be provided by the respective contractors at least weekly.

## F2.7 Site Inspection and Maintenance

1. A self-auditing program will be established based on a check sheet (Refer CSWMP). A site inspection using the check sheet will be made by the site manager:
  - At least weekly;
  - Immediately before site closure; and

- Immediately following rainfall events in excess of 5mm in any 24 hour period.

The self-audit will include:

- Recording the condition of every sediment control device;
  - Recording maintenance requirements (if any) for each sediment control device;
  - Recording the volumes of sediment removed from sediment retention systems, where applicable;
  - Recording the site where sediment is disposed; and
  - Forwarding a signed duplicate of the completed Check Sheet to the project manager/developer for their recording.
2. In addition, the site manager will be required to oversee the installation and maintenance of all soil and water management works on the site. The person shall be required to provide a short monthly written report to the superintendent. The responsible person will ensure that:
- The plan is being implemented correctly;
  - Repairs are undertaken as required; and
  - Essential modifications are made to the plan if and when necessary.

The report shall include a certificate that works have been carried out in accordance with the plan.

3. Waste bins will be emptied as necessary. Disposal of waste will be in a manner approved by the Site Superintendent.
4. Proper drainage will be maintained. To this end, drains (including inlet and outlet works) will be checked to ensure that they are operating as intended, especially that:
- No low points exist that can fill and overtop in a large storm event;
  - Areas of erosion are repaired (e.g. lined with a suitable material) and/or velocity of flow is reduced appropriately through construction of small check dams and installing additional diversion upslope; and
  - Blockages are cleared (these might occur because of sediment pollution, sand/soil/spoil being deposited in or too close to them, breached by vehicle wheels, etc.).
5. Sand/soil/spoil materials placed closer than 2 metres from hazard areas will be removed. Such hazard areas include areas of high velocity water flows (e.g. waterways and gutters), paved areas and driveways.
6. Recently stabilised lands will be checked to ensure that erosion hazard has been effectively reduced. Any repairs will be initiated as appropriate.
7. Excessive vegetation growth will be controlled through mowing or slashing.
8. All sediment detention systems will be kept in good working condition. In particular, attention will be given to:

- a) Recent works to ensure they have not resulted in diversion of sediment laden water away from them;
  - b) Degradable products to ensure they are replaced as required; and
  - c) Sediment removal, to ensure the design capacity remains in the settling zone.
9. Any pollutants removed from sediment basins or litter traps will be disposed of in areas where further pollution to down slope lands and waterways should not occur.
  10. Additional erosion and/or sediment control works will be constructed as necessary to ensure the desired protection is given to down slope lands and waterways, i.e. make ongoing changes to the plan where it proves inadequate in practice or is subjected to changes in conditions at the work site or elsewhere in the catchment.
  11. Erosion and sediment control measures will be maintained in a functioning condition until all earthwork activities are completed and the site fully stabilised.
  12. Litter, debris and sediment will be removed from the gross pollutant traps and trash racks as required.

### **F3 SEDIMENT BASIN OPERATION AND MANAGEMENT**

#### **F3.1 General**

1. This section of the report describes the general requirements for Sediment Basin, sizing and operation and management.
2. Sediment basins Type D (Soil Hydrological Group) construction.
3. Basins to operate as wet basins and 5-day cycle. Basins are designed to retain sediment-laden water allowing adequate time for the gravitational settlement of fine sediment particles. Basins are not to be drained until adequate water quality is obtained in the basin as noted in **Section 8.2** of the SMP.
4. Sediment basins will be constructed prior to site disturbance to ensure that adequate rainfall runoff mitigation during construction has been made.
5. Refer drawings for basin sizing calculations and for basin locations, spillway details and basin details.
6. Basins shall be constructed in a manner that facilitates conversion to operational water quantity-and-quality management structures in future.
7. Basin sizing based on RUSLE and following parameters.
 

|                                         |            |
|-----------------------------------------|------------|
| a. Soil Texture Group                   | F          |
| b. Soil Hydrological Group              | D          |
| c. Design Rainfall Depth                | 5 days     |
| d. 5-day, 85% percentile Rainfall event | 32.2mm     |
| e. 2yr, 6hr storm intensity             | 10.9mm/ hr |
| f. Rainfall Erosivity ®                 | 2580       |

- |                                        |          |
|----------------------------------------|----------|
| g. Soil erodibility (K-factor)         | 0.075    |
| h. Length/ Gradient Factor (LS-factor) | 0.27     |
| i. Erosion Control Practice (P-Factor) | 1.3      |
| j. Ground cover (C-Factor)             | 1        |
| k. Soil Loss Class                     | 1        |
| l. Erosion Hazard                      | Very Low |
8. Constructed sediment basins must be maintained and fully operational throughout the construction period and until each basin's catchment area achieves stabilisation with C-factor of 0.1 or permanent stabilisation.
  9. Before starting any clearing or construction, all the necessary materials and components will be on the site to avoid delays in implementing the sediment controls once works begin.
  10. Required short-term sediment control measures will be installed downstream of the proposed earthworks to control sediment runoff during construction of the basin.
  11. The area to be covered by the embankment, basin borrow pits (if required) and incidental works, together with an area extending beyond the limits of each for a distance not exceeding five (5) metres all around will be cleared of all trees, scrub, stumps, roots, dead timber and rubbish and disposed of in a suitable manner.
  12. All holes made by grubbing within the embankment footprint will be filled with sound material, adequately compacted, and finished flush with the natural surface.
  13. Spillway sizing has been provided to accommodate capacity for storm flows to the 1 in 10-year ARI storm event.

### **F3.2 Sediment Basin Operation**

1. Type D basins will be operated as wet basins with the settled/ treated water decanted from the basin as soon as suitable.
2. Type D basin based on a maximum 5-day cycle. That being the filling, treatment and discharge of the basin is required within a 5-day period following cessation of rainfall.
3. Appropriate coagulation of sediment basins will be undertaken if the contained water does not achieve the specified water quality standard (TSS<50mg/L) within the required 5-day period. Refer notes on drawings.
4. Recommended coagulant/ flocculant is gypsum at a dose rate between 32-50kg/ 100m<sup>3</sup> of sediment water. Dosage rates will be determined on site as required to achieve water quality requirements. Alternate flocculant products can be considered with consultation with the CPESC.
5. Sediment basin water quality samples will be taken at a depth no greater than 200mm above the level of settled sediment.



6. Discharged water will meet the discharge criteria defined in **Section 8.2** of the **SMP**. Testing to be completed using acceptable (and appropriately calibrated) field instrument or lab testing.
7. Settled sediment will be removed from sediment basins when the volume of the sediment exceeds the designated sediment storage volume (as nominated on the ESCP drawings), or the design maximum sediment storage elevation. Sediment marker and water level indicators to be provided in accordance with Landcom Blue Book requirements as detailed on drawings in **Appendix A**.

### **F3.3 Sediment Basin Maintenance**

1. The sediment basin will be inspected during the following periods:
  - a. During construction to determine whether machinery, falling trees, or construction activity has damaged any components of the sediment basin. If damage has occurred it will be repaired.
  - b. After each runoff event. Inspect the erosion damage at flow entry and exit points. If damage has occurred the necessary repairs will be made.
  - c. At least fortnightly in the absence of (b) above.
  - d. Prior to, and immediately after, periods of “stop work” or site “shutdown”.
2. Accumulated sediment will be cleaned out when it reaches the marker board/post, and restore the original storage volume restored. Place sediment in a disposal area or, if appropriate, mix with dry soil on the site for use in earthworks or other acceptable/ agreed manner as per Notes 3 & 4 below.
3. Sediment will not be disposed of in a manner that will create an erosion or pollution hazard.
4. Removed sediment will be moved to a location for moisture conditioning and reuse as engineered site fill. Sediment intended for re-use should be confirmed as acceptable for use as engineered fill following testing and approval from the geotechnical engineer. The geotechnical engineer shall confirm whether the material conforms to the bulk earthworks filling specification. The location for moisture conditioning will be chosen such that it remains within the catchment of a sediment basin and erosion control system. Alternatively, sediment removed from basins shall be disposed of from site in an approved manner. The material shall be tested for any contaminants and be classified, in accordance with EPA Waste Classification Guidelines, by an environmental consultant prior to disposal.
5. All visible pipe connections will be checked for leaks, and repair as necessary.
6. Fill material in the dam will be checked for excessive settlement, slumping of the slopes or piping between the conduit and the embankment; make all necessary repairs.
7. All trash and other debris will be removed from the basin and riser.
8. Submerged inflow pipes will be inspected and de-silted (as required) after each inflow event.

### F3.4 Sediment basin rehabilitation

1. Required drainage, erosion and sediment control measures during the decommissioning and rehabilitation of a sediment basin will comply with same standards specified for the normal construction works.
2. Upon decommissioning of a sediment basin, all water and sediment will be removed from the basin prior to removal of the embankment (if any). Any such material, liquid or solid, will be disposed of in a manner that will not create an erosion or pollution hazard.
3. A basin's catchment conditions associated with the staged decommissioning of the basin will comply with the specified sediment control standard.
4. If the permanent outlet structure is constructed prior to stabilisation of the up-slope catchment area, then this outlet structure will not be made operational.
5. The permanent stormwater treatment features (e.g. vegetation and filtration media) will be appropriately protected from the adverse effects of sediment runoff per the details provided.
6. A sediment basin will not be decommissioned until all up-slope site stabilisation measures have been implemented and are appropriately working to control soil erosion and sediment runoff in accordance with the specified ESC standard and minimum permanent stabilisation works.
7. Immediately prior to the construction of the permanent stormwater treatment device, appropriate flow bypass conditions will be established to prevent sediment-laden water entering the device.
8. Immediately following the construction of the filter media of the permanent stormwater treatment device, the filter media will be covered by heavy-duty filter cloth (minimum Bidim A44 or equivalent) and a minimum 200mm layer of earth or sacrificial filter media. Such earth and filter cloth will not be removed from the device until suitable surface conditions being achieved within the basin's catchment area.
9. Immediately following the construction of the bioretention system an appropriate sediment forebay, filter or straw-bale system will be installed in a manner to prevent sediment intrusion into the device.
10. Plant establishment within the permanent stormwater treatment device will be delayed until sediment intrusion into the device is suitably under control.
11. Upon stabilisation of the contributing catchment being achieved, the operational features of the permanent stormwater treatment system will be made fully operational (i.e. maintenance and/or reconstruction as required).
12. Upon the approval of the engineer or site supervisor, the newly constructed permanent stormwater treatment features of the basin will be made operational if such actions do not prevent the site from operating at the required sediment control standard.

## Daily Site Inspection

LOCATION .....

SITE SUPERVISOR ..... DATE .....

SIGNATURE .....

Legend:      ☐ OK                      ☐ Not OK                      N/A Not applicable

| Item | Consideration                                                                                                                                                                | Assessment |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1    | All tradespeople working on the site have been informed of the erosion and sediment control requirements of the site.                                                        | .....      |
| 2    | All required builder identification, safety notices, and pollution (e.g. litter and sediment control) management signs are visible.                                          | .....      |
| 3    | The work site and all erosion and sediment control measures do not represent a safety risk to tradespeople or the public.                                                    | .....      |
| 4    | Public roadways are clear of sediment.                                                                                                                                       | .....      |
| 5    | Turfing on the footpath area is clear of sediment, sand and mud.                                                                                                             | .....      |
| 6    | Entry/exit pads are clear of excessive sediment deposition.                                                                                                                  | .....      |
| 7    | Entry/exit pads have adequate available void spacing to trap sediment.                                                                                                       | .....      |
| 8    | The construction site is clear of litter and unconfined rubbish.                                                                                                             | .....      |
| 9    | Long-term (> 24 hours) soil/sand stockpiles are protected from wind, rain, and stormwater flow.                                                                              | .....      |
| 10   | At end of day, all short-term soil/sand stockpiles located outside the sediment control zone have been removed and cleaned.                                                  | .....      |
| 11   | No dust problems exist on the site.                                                                                                                                          | .....      |
| 12   | Up-slope “clean” water is being appropriately diverted through the site in a non-erosive manner.                                                                             | .....      |
| 13   | Drainage lines are free of soil scour and sediment deposition.                                                                                                               | .....      |
| 14   | Stormwater flow down exposed earth batters does not cause erosion.                                                                                                           | .....      |
| 15   | Appropriate erosion controls of all finished soil disturbances have been discussed with the client.                                                                          | .....      |
| 16   | Sediment fences have been correctly installed (e.g. fabric buried and standing up-slope of stakes) and are free of damage.                                                   | .....      |
| 17   | Sediment fences have been installed in a manner that will allow sediment-laden stormwater to temporarily pond and settle behind the fence rather than flow around the fence. | .....      |
| 18   | Appropriate sediment controls have been placed adjacent to, or around, stormwater inlets—as appropriate for the type of inlet.                                               | .....      |
| 19   | All sediment traps are free of excessive sediment deposition.                                                                                                                | .....      |

- |    |                                                                                                   |       |
|----|---------------------------------------------------------------------------------------------------|-------|
| 20 | Finished service trenches have been appropriately backfilled, compacted and stabilised.           | ..... |
| 21 | All reasonable and practicable measures are being taken to control sediment runoff from the site. | ..... |
| 22 | The site is adequately prepared for potential storms.                                             | ..... |
| 23 | Adequate stockpiles exist of ESC materials, such as extra sediment fence fabric.                  | ..... |
| 24 | Temporary downpipes have been correctly connected to any installed roof gutters.                  | ..... |

**WEEKLY SITE INSPECTION SHEET****LOCATION** .....**INSPECTION OFFICER** ..... **DATE** .....

.....

**SIGNATURE** .....Legend:      ☐ OK                      ☐ Not OK                      N/A Not applicable

| <b>Item</b> | <b>Consideration</b>                                                                                                         | <b>Assessment</b> |
|-------------|------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1           | Public roadways clear of sediment.                                                                                           | .....             |
| 2           | Entry/exit pads clear of excessive sediment deposition.                                                                      | .....             |
| 3           | Entry/exit pads have adequate void spacing to trap sediment.                                                                 | .....             |
| 4           | The construction site is clear of litter and unconfined rubbish.                                                             | .....             |
| 5           | Adequate stockpiles of emergency ESC materials exist on site.                                                                | .....             |
| 6           | Site dust is being adequately controlled.                                                                                    | .....             |
| 7           | Appropriate drainage and sediment controls have been installed prior to new areas being cleared or disturbed.                | .....             |
| 8           | Up-slope “clean” water is being appropriately diverted around/through the site.                                              | .....             |
| 9           | Drainage lines are free of soil scour and sediment deposition.                                                               | .....             |
| 10          | No areas of exposed soil are in need of erosion control.                                                                     | .....             |
| 11          | Earth batters are free of “rill” erosion.                                                                                    | .....             |
| 12          | Erosion control mulch is not being displaced by wind or water.                                                               | .....             |
| 13          | Long-term soil stockpiles are protected from wind, rain and stormwater flow with appropriate drainage and erosion controls.  | .....             |
| 14          | Sediment fences are free from damage.                                                                                        | .....             |
| 15          | Sediment-laden stormwater is not simply flowing “around” the sediment fences or other sediment traps.                        | .....             |
| 16          | Sediment controls placed up-slope/around stormwater inlets are appropriate for the type of inlet structure.                  | .....             |
| 17          | All sediment traps are free of excessive sediment deposition.                                                                | .....             |
| 18          | The settled sediment layer within a sediment basin is clearly visible through the supernatant prior to discharge such water. | .....             |
| 19          | All reasonable and practicable measures are being taken to control sediment runoff from the site.                            | .....             |
| 20          | All soil surfaces are being appropriately prepared (i.e. pH, nutrients, roughness and density) prior to revegetation.        | .....             |
| 21          | Stabilised surfaces have a minimum 70% soil coverage.                                                                        | .....             |
| 22          | The site is adequately prepared for imminent storms.                                                                         | .....             |
| 23          | All ESC measures are in proper working order.                                                                                | .....             |

**APPENDIX D – FLOOD RESPONSE AND EVACUATION PLAN**

# **STAGE 1 & 2 FLOOD EMERGENCY RESPONSE PLAN**

## **SSD 7500 MOD1 CULVERSTON ROAD MINTO NSW**

***Prepared For:***

**TEXCO**

**12.1/160 Bourke Road**

**ALEXANDRIA NSW 2015**

***Prepared by:***

**Costin Roe Consulting**

**Level 1, 8 Windmill Street**

**WALSH BAY NSW 2000**

***Rev: B***



**DOCUMENT VERIFICATION**

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| <b>Document Title</b> | Stage 1 & 2 Flood Emergency Flood Plan, SSD 7500 MOD1 |
| <b>Project No.</b>    | Co14506.01                                            |
| <b>Description</b>    | Flood Emergency Flood Plan (FERP) for SSD 7500 MOD1   |
| <b>Client Contact</b> | Mr Richard Porter, Texco                              |

|                    |                          |                  |
|--------------------|--------------------------|------------------|
|                    | <b>Name</b>              | <b>Signature</b> |
| <b>Prepared by</b> | Mark Labid & Mark Wilson | ML/ MW           |
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## **APPENDICES**

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| <b>APPENDIX A</b> | <b>Costin Roe Consulting drawings</b>                                 |
| <b>APPENDIX B</b> | <b>Catchment Simulation Solutions Letter dated<br/>29 March 2016.</b> |
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# 1 INTRODUCTION

## 1.1 Background

Costin Roe Consulting Pty Ltd has been commissioned by Texco to prepare this *Flood Emergency Response Plan (FERP)* for construction Stage 1 & 2 Warehouses, as approved by the NSW Department of Planning, Industry & Environment (DPIE) SSD-7500 MOD1 (dated 16 December 2020) consent.

The submission of the FERP for approval by DPIE has been completed in accordance with **Conditions of Consent (CoC) B13, B14 & B15**. This FERP forms part of the *Construction Environmental Management Plan (CEMP)* & *Operational Environmental Management Plan (OEMP)* as required of **CoC C1 & C4**.

This SMP has been prepared in accordance with the reporting requirements of **CoC C7**.

The subject area of this FERP comprises emergency responses for both construction and operational phases of the development.

The requirements outlined in this report are consistent with the provisions of the Floodplain Risk Management Guideline (OEH 2007) and the NSW Floodplain Development Manual (2005), and the flooding and overland flow assessments included in the approved SSD-7500 and SSD-7500 MOD1.

This FERP is to be read in conjunction with the most current SES flood plan. Refer **Appendix D** for June 2015 version of the *Campbelltown City Local Flood Plan, Vol 1: Campbelltown City Flood Emergency Sub Plan*.

## 1.2 Scope

This FERP provides details of the emergency responses for the development during construction and operational phases for flooding, as part of a CEMP and OEMP required for the DPIE submission approval under **CoC B13**.

This plan details the site responses to flooding including predicted flood levels, flood warning time and flood notification, assembly points and evacuation routes (if necessary), evacuation and refuge protocols and awareness training for employees and contractors.

The FERP will be read in conjunction with the drawing **Co14506.01-F01** as included in **Appendix A**.

### 1.3 Conditions of Consent Matrix

The FERP has been completed in accordance with the approved Flood Impact Assessment and EIS approved in the NSW DPIE in SSD-7500 and SSD-7500 MOD1.

We provide the following tables which confirms how and where, within the report or respective drawings and models, each of the requirements of SSD-7500 MOD1 **CoC B13** through **B15** have been met.

#### **SSD-7500 MOD1 Consent Condition Matrix**

| <b>CoC No.</b>                 | <b>Item</b>                                                                                                                                                                                                                                                                                                              | <b>Response</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Flood Management</i></b> |                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b><i>B13</i></b>              | <i>Prior to the commencement of construction, the Applicant must prepare a Flood Emergency Response Plan, in consultation with the State Emergency Service and Council and to the satisfaction of the Planning Secretary. The Plan shall form part of the CEMP &amp; OEMP required by condition C1 and C4 and shall:</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b><i>B13(a)</i></b>           | <i>be prepared by a suitably qualified and experienced person(s);</i>                                                                                                                                                                                                                                                    | <p><u>Response</u></p> <p>This FERP has been prepared for the applicant by Costin Roe Consulting Pty Ltd, civil and structural consulting engineers. Costin Roe Consulting is experienced in the preparation and implementation of <i>Flood Emergency Response Plans</i> for industrial developments of similar scope to this development.</p> <p>Recent similar projects include The Moorebank Intermodal Precinct East and West, Bankstown Airport, The Yards Industrial Estate at Kemps Creek and the DEXUS Quarry at Greystanes.</p> |
| <b><i>B13(b)</i></b>           | <i>address the provisions of the Floodplain Risk Management Guideline (OEH, 2007);</i>                                                                                                                                                                                                                                   | The FERP has been completed and addresses the as required of <i>Managing Urban Stormwater - Soils and Construction Volume the provisions of the Floodplain Risk Management Guideline (OEH, 2007)</i> , Campbelltown City Council requirements and per accepted engineering and best practice.                                                                                                                                                                                                                                            |
| <b><i>B13(c)</i></b>           | <i>include details of:</i> <ol style="list-style-type: none"> <li><i>the flood emergency responses for both construction and operation phases of the development;</i></li> </ol>                                                                                                                                         | <b>Sections 4</b> through <b>7</b> of the FERP includes details of flood behaviour, hazard categorisation, flood safety and evacuation, and flood responses. Further demonstration                                                                                                                                                                                                                                                                                                                                                       |

| CoC No.                             | Item                                                                                                                                                                                                                                                                                             | Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | <ul style="list-style-type: none"> <li>ii. the predicted flood levels, flood warning time and flood notification;</li> <li>ii. assembly points and evacuation routes;</li> <li>iv. evacuation and refuge protocols; and</li> <li>v. awareness training for employees and contractors.</li> </ul> | of these items is included in drawing in <b>Appendix A</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| B14                                 | All floor levels must be no lower than the 1% Annual Exceedance Probability flood plus 500 mm of freeboard.                                                                                                                                                                                      | <p><u>Response</u></p> <p>All Building Earthwork pad levels are confirmed to be 0.5m above the 1% AEP level, and future buildings will be higher than the earthworks pad level.</p> <p>Refer <b>Section 2.2</b> and Section 4.2 for confirmation of building levels and flood planning level requirements.</p>                                                                                                                                                                                                    |
| B15                                 | Any structures below the 1% Annual Exceedance Probability plus 500 mm of freeboard must be constructed from flood compatible building components.                                                                                                                                                | <p><u>Response</u></p> <p>All Buildings and structures are higher than the 1% AEP level plus 0.5m freeboard and do not require flood compatible building components as such.</p> <p>Refer <b>Section 2.2</b> and Section 4.2 for confirmation of building levels and flood planning level requirements.</p>                                                                                                                                                                                                       |
| <b>Management Plan Requirements</b> |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| C7                                  | The Applicant must ensure that the environmental management plans and sub-management plans required under conditions C1, C2 and C4 of this consent are prepared by a suitably qualified person or persons in accordance with best practice and include:                                          | <p>This FERP has been prepared for the applicant by Costin Roe Consulting Pty Ltd, civil and structural consulting engineers. Costin Roe Consulting is experienced in the preparation and implementation of <i>Flood Emergency Response Plans</i> for industrial developments of similar scope to this development.</p> <p>Recent similar projects include The Moorebank Intermodal Precinct East and West, Bankstown Airport, The Yards Industrial Estate at Kemps Creek and the DEXUS Quarry at Greystanes.</p> |
| C7(a)                               | Detailed Baseline Data                                                                                                                                                                                                                                                                           | <u>Response</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| CoC No. | Item                                                                                                                                                                                                                                                                                                                                                                                                                       | Response                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                                                                                                                                                                                                                                                                                                                                                                                                                            | Detailed baseline data, pertaining to the development and flooding, is included in <b>Section 2, Section 4 &amp; 5</b> and <b>Appendices A &amp; C</b> of the FERP.                                                                                                                                                                                                                                             |
| C7(b)   | <p><i>Details of:</i></p> <p>(i) <i>The relevant statutory requirements (including relevant approval, licence or lease conditions);</i></p> <p>(ii) <i>Any relevant limits or performance measures and criteria; and</i></p> <p>(iii) <i>The specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures.</i></p> | <p><u>Response</u></p> <p>Statutory requirements are included in <b>Section 3.3</b> of the FERP.</p> <p>Water levels and safety of occupants, being the measure of performance and performance indicators, are provided in <b>Section 7</b> of the FERP.</p>                                                                                                                                                    |
| C7(c)   | <i>A description of the measures to be implemented to comply with the relevant statutory requirements, limits or performance measures and criteria</i>                                                                                                                                                                                                                                                                     | <p><u>Response</u></p> <p>Measures required to be implemented are included in <b>Sections 3</b> of the FERP.</p>                                                                                                                                                                                                                                                                                                |
| C7(d)   | <p><i>A program to monitor and report on the:</i></p> <p>(i) <i>Impacts and environmental performance of the development</i></p> <p>(ii) <i>Effectiveness of the management measures set out pursuant to paragraph (c) above.</i></p>                                                                                                                                                                                      | <p><u>Response</u></p> <p>Inspection and monitoring requirements have been included in <b>Section 3</b> of the FERP.</p> <p>Additional reference to <b>Sections 3.5 to 3.9</b> should be made for contingency planning, incident classification and notification, environmental auditing and reporting, non-compliance, non-conformance and actions, and review and improvement requirements, respectively.</p> |
| C7(e)   | <i>A contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.</i>                                                                                                                                                                                                                   | <p><u>Response</u></p> <p>Reference to <b>Section 3.5</b> of the FERP for contingency planning.</p>                                                                                                                                                                                                                                                                                                             |
| C7(f)   | <i>A program to investigate and implement ways to improve the</i>                                                                                                                                                                                                                                                                                                                                                          | <u>Response</u>                                                                                                                                                                                                                                                                                                                                                                                                 |

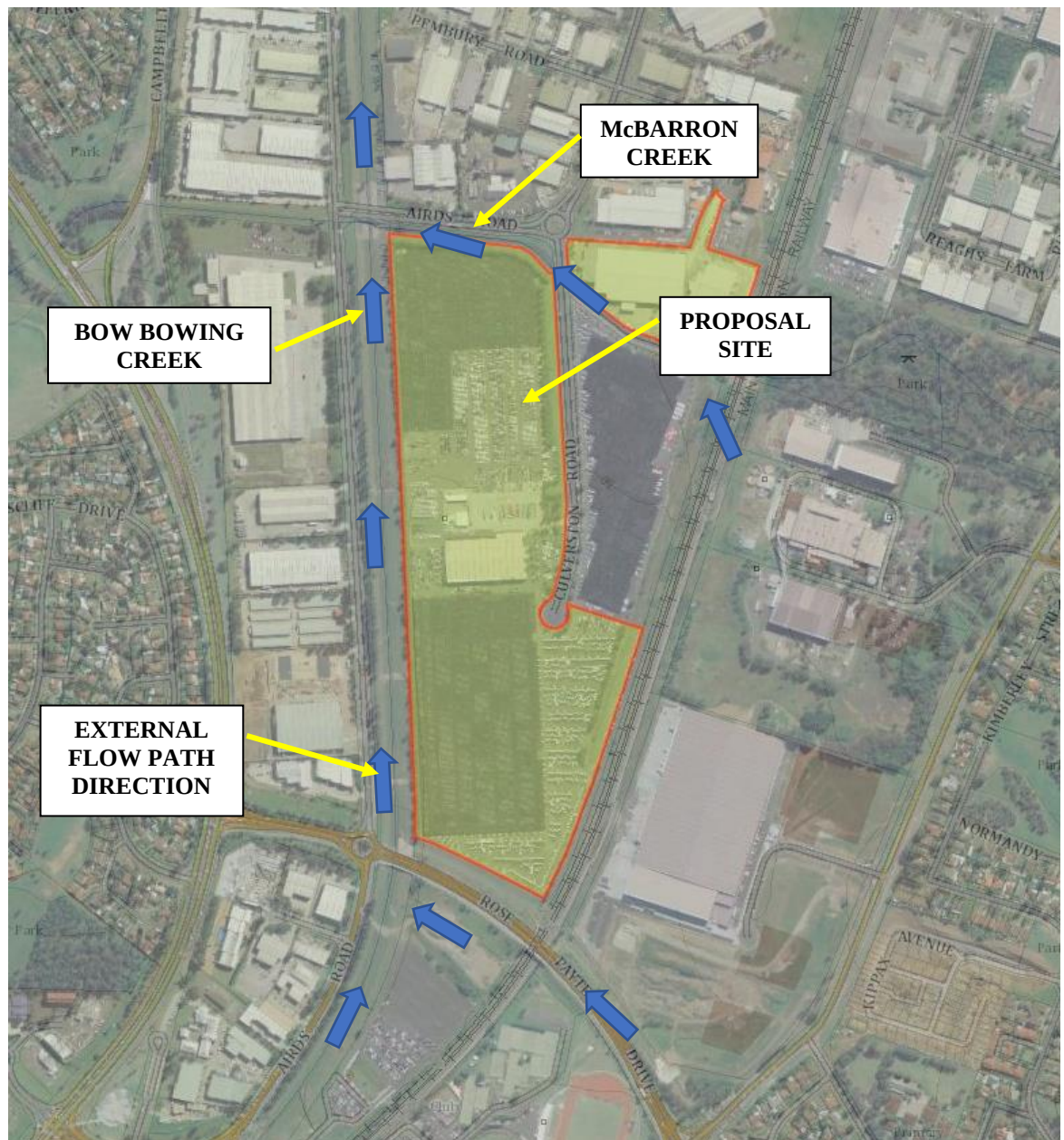


| CoC No. | Item                                                                                                                                                                                                                                                                                                                           | Response                                                                                                                                                                                                                          |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <i>environmental performance of the development over time.</i>                                                                                                                                                                                                                                                                 | Reference to <b>Sections 3.9</b> should be made for review and improvement requirements.                                                                                                                                          |
| C7(g)   | <i>A protocol for managing and reporting any:</i> <ul style="list-style-type: none"> <li><i>(i) Incident and any non-compliance (specifically including any exceedance of the impact assessment criteria);</i></li> <li><i>(ii) Complaint;</i></li> <li><i>(iii) Failure to comply with statutory requirements;</i></li> </ul> | <u>Response</u><br>Reference to <b>Sections 3.6-3.8</b> should be made for, incident classification and notification, environmental auditing and reporting, non-compliance, non-conformance and actions requirements respectively |
| C7(h)   | <i>A protocol for periodic review of the plan.</i>                                                                                                                                                                                                                                                                             | <u>Response</u><br>Reference to <b>Sections 3.9</b> should be made review and improvement requirements.                                                                                                                           |

## 2 DEVELOPMENT SITE

### 2.1 Site Description

The development site is located on the western side of Culverston Road, South of Airds Road, east of Bow Bowing Creek trunk drainage channel and north of Rose Payton Drive in the suburb of Minto. The proposal site and Stage 1, 2 and 3 Warehouses are located on the northern portion of the project area, as shown in **Figure 2.1**.



**Figure 2.1 Locality Plan & Flow Paths** (Source: Six Maps 2021)

The approved proposal site encompasses an area of 29.36 Ha. The land is currently being used as a car and vehicle storage facility and comprises significant impervious surfaces (approx. 95% site coverage) with hail nets for vehicle protection.

The proposal site is noted to be within a long established industrial area of Minto and is surrounded by many industrial developments and no nearby residential receivers.

The following descriptions of the existing site are:

- The land use on the site is currently industrial and a fully developed and paved vehicle storage facility.
- Formal drainage systems and dedicated pipe drainage outlets to Bow Bowing Creek and Culverston Road exist. There are three outlets available for the Stage 1, 2 and 3 Warehouses to Bow Bowing Creek and a further three available to Culverston Road.
- Watercourses are identified adjacent on the site, noting these consist of engineered channels as part of trunk drainage infrastructure for the Minto industrial precinct – refer **Figure 2.1** and **Section 2.7**.
- Previous survey information shows that the land falls from the north and north-west to the east and south-east corner of the site. The highest level on the site, at RL 56.65m AHD, is located at the south-east corner of the site and the lowest level is RL 46.0m AHD at the north-west corner.
- Inverts within Bow Bowing Creek are shown to vary from RL 45m AHD (upstream southern end of site) to RL 43m AHD (downstream adjacent to northern end of the site).
- The grades over the site are in the order of 1-2%.

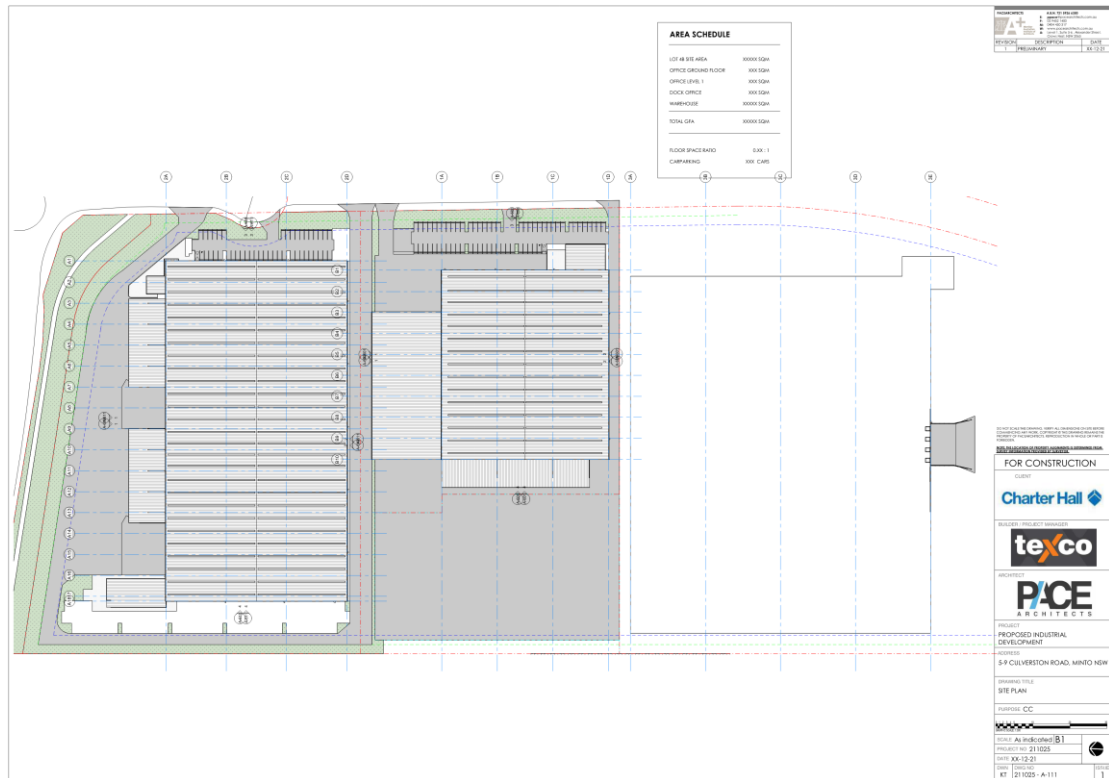
## 2.2 Proposed Development Description

The proposed construction works for this submission comprises construction of two warehouse facilities, the Stage 1 & 2 Warehouses.

The development comprises the following elements:

- Two steel framed warehouse buildings (noting the Stage 3 & 4 Warehouse is not part of this SMP);
- Ancillary office space on the east of Stage 1 and 2 warehouse buildings;
- At grade car parking on the street frontage of buildings with access from the existing Culverston Road cul-de-sac;
- Truck circulation and loading areas;
- Fire brigade access around the full perimeter of each building and development site; and
- Stormwater drainage and flood management systems completed in accordance with the Stormwater Management Strategy approved under SSD 7500.

Refer to **Figure 2.2** for the proposed site layout as produced by Pace Architects.



**Figure 2.2. Proposed Development Layout**

Proposed building levels, as approved in SSD-7500 MOD1, are as follows:

- Stage 1 = 48.0m AHD
- Stage 2 = 48.0m AHD

We note the Stage 3 & 4 developments do not form part of this SMP.

## 2.3 Existing Geology & Soils

A geotechnical assessment has been completed by Golder Associates as part of the SSD7500 EIS. The site conditions and proposed modification conditions remain consistent between the SSD7500 approval and modification proposal. Refer report *Geotechnical Investigation for Warehousing Development* (Golders Ref: 1648232-002-R-Rev0, dated April 2016) for detailed information pertaining to geotechnical profile and investigations.

The 1:100,000 Wollongong-Port Hacking Geological Sheet (GS 9029-9129, 1985) indicates that ground conditions at the site comprise of Quaternary paleochannel deposits, including fluvial sand, clay and silt. The paleochannel is underlain by Ashfield Shale and Hawkesbury Sandstone.

Acid Sulfate Risk Maps (ASRIS) indicate the area is in a region with no known occurrence of acid sulfate soils. Acid sulfate soils are generally only expected at elevations of less than 5 m AHD in coastal areas (RTA,2005), and are not expected at the site due to its elevation of approximately 45 to 50 m AHD.

The Golders investigation describes the subsurface profile as follows:

### **“Unit 1 – Fill**

#### **Unit 1A - Topsoil**

*Topsoil was only observed on the fringes of the site, generally associated with the surrounding garden areas. Topsoils generally consisting of clays and silts, were encountered in four boreholes (GA-BH02, GA-BH03, GA-BH04 and GA-BH05). The topsoils generally extend to depths between 0.1 m and 0.4 m depth below ground surface, with an average thickness of 200 mm. At the time of the investigation the topsoil was generally dry and underlain by "Fill" (i.e. soil Unit 1c described below).*

#### Unit 1B – Hardstand Pavement

*An asphalt or concrete hardstand covers the majority of the site. An asphalt pavement surface approximately 30 mm thick was encountered at two borehole locations (GA-BH07 and GA-BH08). The asphalt was observed to be generally dark grey, poorly bound and was underlain by a thin layer of sub-base gravelly sand, extending to depths of 0.4 m and 0.2 m below the ground surface.*

#### Unit 1C – Fill

*Two soil stockpiles running roughly north-south, parallel to Culverston Road were observed during the investigation. Existing fill material was encountered at all borehole locations and generally comprises medium plasticity silty clay, clay and sandy clay with some angular gravel. It was generally found immediately beneath the topsoil/asphalt pavement or at existing ground surface level and extended to depths between 1.6 m and 4.4 m below ground surface.*

*Fill was also encountered in all of the hand auger locations within the soil stockpiles. All hand auger holes terminated within the fill unit.*

*In situ testing (SPTs and pocket penetrometers) indicate the fill is generally very stiff, with firm layers encountered immediately below sub-base layers in boreholes GA-BH07 and GA-BH08.*

#### Unit 2 – Alluvium

*The alluvial material encountered generally comprises high plasticity grey and brown clay and was encountered beneath the Unit 1C fill in all boreholes. The exception to this is borehole GA-BH06, which was terminated within the fill at 3 m depth. The alluvium was found at depths as shallow as 1.6 m (GA-BH07) but generally began at about 3 m and continued to greater than 8 m depth below ground surface.*

*In situ testing (SPTs and pocket penetrometers) indicated the fill is generally stiff to very stiff, with some zones of firm or hard material (GA-BH04)."*

## **2.4 Groundwater**

The Golder Associated investigation identified groundwater at depths of 4-6m below ground level.

The impact on the overall groundwater system was reviewed and confirmed acceptable. Impact as a result of the currently proposed development are negligible given the existing industrial development on the land and anticipated filling on the site

The effect on impact is considered to meet the requirements of the SEARS and initial responses by the NSW DPI.

## 2.5 Climate and Meteorology

The Minto area experiences relatively mild temperatures and moderate rainfall, with a yearly average rainfall of about 780mm, based on records from a nearby observation site at Horsley Park since 1997 (Station 67119).

Typically, the wettest month (mean rainfall) is February, and driest is September. It is noted that July and August show similar mean rainfall amounts to September.

The annual mean minimum temperature is 12.1°C and the mean maximum temperature is 23.9°C. The hottest month is usually January (mean maximum of 30.1°C) and the coldest month is usually July (mean minimum of 5.8°C).

Climate statistics and average annual rainfall data and rainfall patterns relevant to this site (Horsley Park as sourced from Australian Bureau of Meteorology (BOM)) are included for reference in **Appendix C** of this **SMP**.

## 2.6 Existing Drainage Systems

Existing formal drainage systems are present on the development site constructed and operating to service the existing car storage and processing facility.

The existing system generally comprises graded pavements which direct site runoff as sheet flow to a series of field inlet pits and inground drainage pipes.

Discharge from the site is made via existing dedicated pipe drainage outlets to Bow Bowing Creek and/ or systems in Culverston Road. There are three outlets available for the Stage 1, 2 and 3 Warehouses to Bow Bowing Creek and a further three available to Culverston Road.

### 3 GENERAL REQUIREMENTS

#### 3.1 General Requirements Introduction

This FERP has been prepared with the purpose of providing an understanding of flood behaviour to the users and building occupiers during construction and during operation of Stage 1 & 2 of the SSD-7500 MOD1 development.

This document has been completed with consideration to the guidelines NSW Floodplain Management Manual 2005, *Arcadis Flood Impact Assessment SSD-7500* and other reference documents noted in **Section 3.3**.

The following sections of this FERP provide confirmation of roles and responsibilities, statutory requirements, measures to monitor and report on impacts and performance of the measures implemented, contingency planning and protocols for review and improvement.

#### 3.2 Roles and Responsibilities

1. All Project Personnel are responsible for the implementation of this FERP and have the responsibility to stop works if there is potential for a safety or environmental incident to occur.
2. The key roles and responsibilities for the Project personnel in relation to flood risk management are outlined below in **Table 3.1 and Table 3.2**.

**Table 3.1 Roles and Responsibilities (During Construction)**

| Role                                                   | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contractor's Project Manager<br>(Contractor's PM)      | <p>Manage the delivery of the construction process in relation to flood risk management at the site in conjunction with the Contractor's EM.</p> <p>Provide for training in flood behaviour for personnel directly involved with the implementation of this plan, as required.</p> <p>Identify and allocate Project resources to implement the requirements of this plan.</p> <p>Oversee the implementation and maintenance of this plan.</p> |
| Contractor's Construction Manager<br>(Contractor's CM) | <p>Communicate with all workers including sub-contractors regarding compliance with the FERP.</p>                                                                                                                                                                                                                                                                                                                                             |
| Contractor Environmental Manager<br>(Contractor's EM)  | <p>Co-ordinate to report on implementation of this plan following major rainfall events.</p> <p>Recommend any improvements to the plan and site control measures in conjunction with the engineer.</p>                                                                                                                                                                                                                                        |

| Role            | Responsibilities                                                                                                                                                                                                                                                                                                                          |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <p>Review works proposed within the riparian zone and floodplain.</p> <p>Maintain site records of flood events during the works.</p> <p>Monitor weather forecasts and SES warnings if major rainfall is forecast – refer triggers.</p> <p>Record environmentally relevant incidents.</p> <p>Manage and respond to reported incidents.</p> |
| Site Supervisor | <p>Present toolbox talks that include the requirements of this plan.</p> <p>Inform staff in their understanding of flood behaviour.</p> <p>Manage and respond to reported incidents.</p> <p>Co-ordinate and report on inspections associated with flood events.</p>                                                                       |
| All Personnel   | <p>Understand flood behaviour and the recommendations of the FERP.</p> <p>Report all environmental incidents or safety concerns to the Site Supervisor and/or the Contractor's EM.</p>                                                                                                                                                    |

**Table 3.2 Roles and Responsibilities (During Operation)**

| Role                              | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant/<br>Building Owner      | <p>Provide for training in stormwater management for personnel directly involved with the implementation of this plan, as required.</p> <p>Identify and allocate Project resources to implement the requirements of this plan.</p> <p>Oversee the implementation and maintenance of this plan.</p> <p>Ensure all measures are performing adequately throughout the operation of the estate in perpetuity.</p> |
| Building<br>Management Body       | <p>Ensure maintenance and monitoring of the stormwater management measures are undertaken in accordance with <b>Section 7</b> and <b>Appendix D</b>.</p>                                                                                                                                                                                                                                                      |
| Individual Lot<br>Owners/ Tenants | <p>Ensure flood behaviour local to the development is understood.</p> <p>Ensure personnel are educated in the overall estate FERP.</p>                                                                                                                                                                                                                                                                        |



### 3.3 Legal and Regulatory Requirements

The below sets out the legislation and planning instruments considered in the preparation of this sub plan. It is noted that the regulatory framework for the project is set out in the *CEMP*.

The Project has been approved under the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The FERP has been prepared in accordance with the CoC of SSD-7500 MOD1 (as set out in **Section 1.3** of the FERP) and forms a subsection of the *CEMP & OEMP*. This plan is to be read in conjunction with the *CEMP & OEMP* and any statutory requirements and other management measures included in the *CEMP & OEMP*.

The plan has been completed in accordance with all relevant approvals and regulatory framework.

**Table 3.2** and the following itemised list confirms regulatory guidelines and documents relevant to the FERP.

**Table 3.2. Regulatory Documents and Guidelines**

| Legislation                                              | Description                                                                                                                                                                                                                                        | Relevance to the FERP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Environmental Planning and Assessment Act 1979</i>    | This Act establishes a system of environmental planning and assessment of development Projects for the State.                                                                                                                                      | The CoCs and obligations issued under Part 4 of the EP&A Act are addressed in this plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>Protection of the Environment Operations Act 1997</i> | The objectives of this Act relate to the protection of the environment through pollution prevention and cleaner production, among others.                                                                                                          | <p>Relevant sections of the Act, including duties to report pollution incidents and disposal regulations have been incorporated into this plan and incident response procedures.</p> <p>A key legislative requirement applicable to construction soil and water management is Section 120 of the Protection of the Environment Operations Act 1997 which relates to pollution of waters and the need to implement all reasonable and feasible measures to minimise the risk of pollution of waters.</p> <p>Part 5.7 of the Act requires that a pollution incident causing or threatening material harm to the environment be notified to EPA and other relevant authorities as outlined in the CEMP. Material harm constitutes actual or potential harm to the health or safety of humans and/or ecosystems that is not trivial, or results in actual or potential loss or property damage of amounts in excess of \$10,000 in total.</p> |
| <i>Contaminated Land Management Act 1979</i>             | The general object of this Act is to establish a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation under Division 2 of Part 3, and to ensure | <p>Contamination on site must be assessed and managed in accordance with this act.</p> <p>Division 2, Part 3, Section 11-17 of this Act details requirements for the Management of Contaminated Land.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Legislation                                                                         | Description                                                                                                                                                                                                                                                                                                                                                             | Relevance to the FERP                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     | that contaminated land is managed with regard to the principles of ecologically sustainable development.                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                           |
| <i>Water Management Act 2000</i>                                                    | The objects of this Act are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations.                                                                                                                                                                                          | Although it is not envisaged that any construction activities would be undertaken on waterfront land, any waterfront activities that do occur would be conducted generally in accordance with the NSW Office of Water's Guidelines for Controlled Activities.             |
| <i>Fisheries Management Act 1994</i>                                                | The objectives of this Act seek to conserve fishery resources, fish stocks and key fish habitats.                                                                                                                                                                                                                                                                       | This FERP has been prepared to maintain existing flow regimes surrounding the site and to contain water onsite within sediment basins until discharged with strict water quality requirements. No impacts to fisheries are envisaged as a result of Project construction. |
| <i>Dangerous Goods Regulation (Road and Rail Transport) 2014</i>                    | The main objects of this Regulation are to give effect to the standards, requirements and procedures of the Code so far as they apply to the transport of dangerous goods by land transport, and to promote consistency between the standards, requirements and procedures applying to the transport of dangerous goods by land transport and other modes of transport. | Provisions relating to the storage and transport of dangerous good, such as fuelling procedures and fuel storage, are incorporated into this plan.                                                                                                                        |
| <i>Commonwealth Environmental Protection and Biodiversity Conservation Act 1999</i> | The objectives of this Act seek to promote environmental protection, ecologically sustainable development, biodiversity conservation and the promotion of heritage, among others.                                                                                                                                                                                       | Requirements under EPBC Approval (No. 2011/6086) have been considered during the preparation of this CSWMP.                                                                                                                                                               |

Additional guidelines and standards considered in relation to the preparation of the FERP include:

- NSW Floodplain Management Manual 2005
- OEH 2007, *Floodplain Risk Management Guidelines*
- *Campbelltown DCP Volume 2 Engineering design for Development June 2009*
- SES (2018). *Provision of and Requirements for Flood Warning*
- SES (June 2015) *Campbelltown City Local Flood Plan, Vol 1: Campbelltown City Flood Emergency Sub Plan.*
- Bureau of Meteorology (2013). *Service Level Specification for Flood Forecasting and Warning Services for New South Wales – Version 2.0*
- Australian Rainfall and Runoff – Volume 1 (2019), Engineers Australia.

### 3.4 General FERP Requirements

1. This document is noted to form a sub-plan as part of the *CEMP* & *OEMP* as required under **CoC C1 & C4**.
2. This document and associated drawings are subject to further periodic review throughout the operational period to ensure the requirements and measures set out in this FERP are fit for purpose and allow for any changes which might occur during construction not envisaged during the initial preparation of the FERP.
3. All flood management and response measures will conform to the standards and information contained in:
  - (i) This FERP;
  - (ii) Conditions of Consent;
  - (iii) the approved *CEMP*, *OEMP* and supporting documentation; and
  - (iv) the latest version of SES or Campbelltown Council flood emergency response plans or other emergency response plans relating to flood management.

### 3.5 Contingency Planning

Reference to contingency planning protocols within the *CEMP* or *OEMP* for contingency planning requirements.

### 3.6 Incident Classification and Notification

It is the responsibility of all site personnel to report all environmental incidents to the Site Supervisor and/or the Contractor's EM during construction.

Incident response requirements including classification, responses, external notification and incident review protocol are set out in the *CEMP*. Reference to the *CEMP* should be made pertaining to all incident response protocol.

During operational phase it is the responsibility of the estate management to report and act on any environmental incidents. Refer to the *OEMP* for incident review requirements.

### 3.7 Environmental Auditing and Reporting

Auditing and reporting will be undertaken in accordance with the *OEMP* during operation. Refer to the *OEMP* for details.

### 3.8 Non-compliance, Non-conformance and Actions

It is the responsibility of all site personnel to report non-compliances and non-conformances to the Site Supervisor and/or the Contractor's EM.

Non-compliances, non-conformances and corrective and preventative actions will be managed in accordance with the *OEMP*.

### 3.9 Review and Improvement

The effectiveness of flood emergency response management measures will be confirmed through regular inspections, ongoing site inspections by the Construction Contractor, engineer and the ER/EM during construction. Adjustments as required during the construction period will be made based on confirmed site conditions and effectiveness of the implemented measures.

During operation, effectiveness of flood emergency response management measures will be confirmed through regular review of the FERP. It is recommended that this FERP be reviewed every 3 to 5 years once operations commence. Further additional reviews are to be undertaken following major flood event to confirm real life conditions against baseline conditions, and make any necessary adjustments.

Adjustments as required will be made based on confirmed site conditions and effectiveness of the implemented measures. These will need to be made in conjunction with a suitably qualified engineer, or other professional, who specialises in stormwater and stormwater management.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure. Construction will be undertaken in accordance with the most recent, approved version of this FERP.

## 4 FLOOD BEHAVIOUR

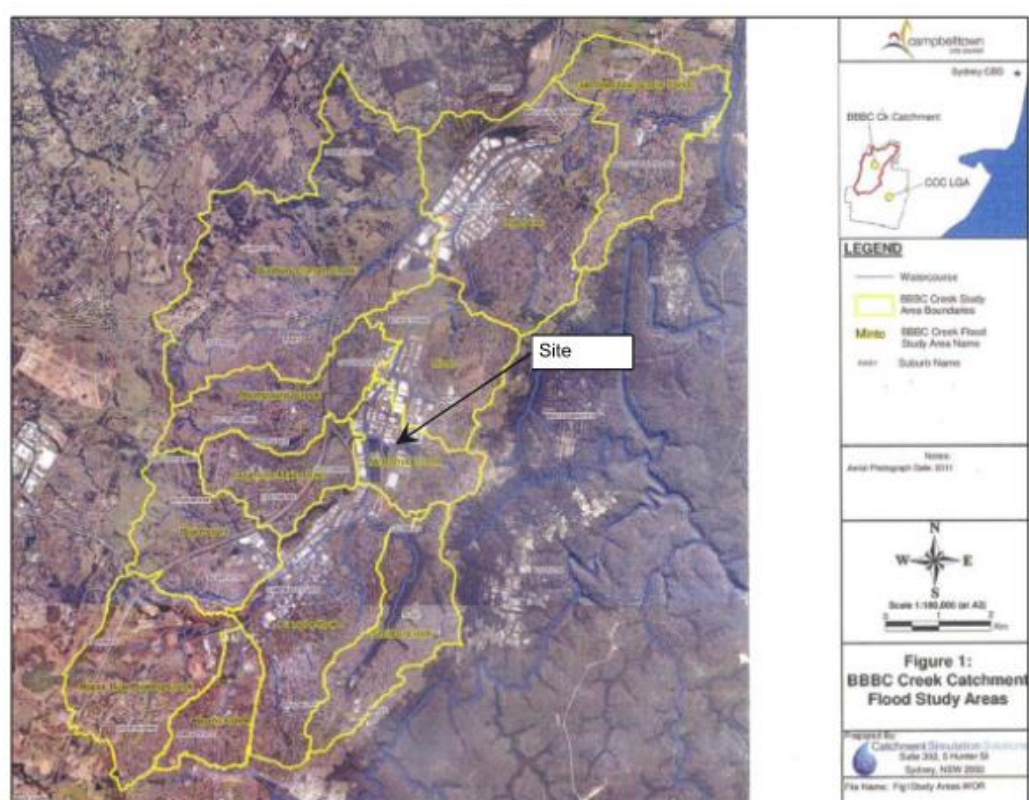
### 4.1 Flood Behaviour Introduction

A comprehensive flood assessment has been completed for Campbelltown City Council by Catchment Simulation Solutions for the Bow Bowing Creek and Bunbury Curran Creek catchments. The outcomes of this study form the primary information included within the SSD-7500 EIS. Outcomes of the flood assessment are included in the Arcadis *Appendix 10 - Flooding & Drainage* document, and subsequent RtS letter dated 23 September 2016.

The assessments completed, and approved, in 2016 were made with consultation with CCC. The SSD-7500 MOD1 development was confirmed to have similar outcomes and consistency with the 2016 assessment and approval.

The property is located adjacent to Bow Bowing Creek on the west and McBarron Creek on the north, as shown in **Figure 2.1**. The property is located approximately 4.5km upstream from the confluence of Bow Bowing Creek and Bunbury Curran Creek.

The site is located approximately central to the contributing upstream catchment which is approximately 38km<sup>2</sup>. The catchment generally comprises a mix of rural land at the far upstream reaches, then comprises mainly residential and industrial areas. **Figure 4.1** shows the site within the catchment as defined in the *Bow Bowing Bunbury Curran Creek Flood Study*.



**Figure 4.1. Bow Bowing Bunbury Curran Creek Flood Study Area and Site**

Councils regional study shows the property is adjacent to the zone of the 1% AEP event and within the floodplain associated with the Probable Maximum Flood (PMF).

**Section 2.3** discusses climate and rainfall. The wettest month is noted to be in February, however we note that the meteorologic conditions in which flooding/overland flow within the surrounding watercourses could be expected would be when either an East Coast Low, or similar low pressure conditions are present. These conditions are more predominate during February through June, however occurrences outside of these months could also be expected.

## 4.2 Flood Extent & Levels

The 2016 assessment confirmed the following outcomes and recommendations:

- The 1% AEP flood levels adjacent to the Stage 1, 2 Warehouses are confirmed in the RtS letter to be RL 46.86m AHD to RL 45.95m in the post development conditions (refer **Figure 4.2** and **Table 4.1**).
- Flood impacts resulting from the development are noted by CCC as being marginal in the post development conditions and the difference in flood level between the filled site and unfilled site “are generally small”.
- The site is noted to be inundated in the PMF hence consideration to risk to property and life is required. The Stage 1 & 2 developments, per **CoC B13**, are noted to require a Flood Emergency Response Plan (FERP) for users of the site. The FERP informs users of flood behaviour, and flood management measures during flood events as set out in this document.

**Figure 4.2** and **Table 4.1** show flood level locations and flood levels for the 1% AEP event in the pre and post development conditions, as per the RtS letter dated 23 September 2016. Relevant locations to the modification proposal are Locations 1, 2 and 3. Of lesser importance, though still relevant, are locations 16, 17 and 18.

Flood planning levels (FPL) per councils requirement of 0.5m above the 1% AEP are RL 47.36m AHD to RL 46.45m AHD. It is confirmed the proposed Stage 1 and 2 warehouse building floor levels, set at RL 48.0m AHD, meet councils FPL requirements.

**Figure 4.3** shows pre-development 1% AEP and PMF flood levels and depths.





**Figure 4.2. 1% AEP Flood Level Location Map**

**Table 4.1. 1% AEP Flood Levels**

| Watercourse                                                    | Ln. | 1% AEP Water Level (mAHD) |                  | PMF Water Level (mAHD) |
|----------------------------------------------------------------|-----|---------------------------|------------------|------------------------|
|                                                                |     | Pre-Development           | Post Development |                        |
| Bow Bowing Channel                                             | 1   | 45.88                     | 45.95            | 48.00                  |
|                                                                | 2   | 46.85                     | 46.86            | 48.95                  |
|                                                                | 3   | 48.50                     | 48.55            | 50.55                  |
|                                                                | 4   | 49.75                     | 49.76            | 51.80                  |
|                                                                | 5   | 50.05                     | 50.05            | 52.45                  |
| Formalised grass channel to the south (Rose Payten Drive side) | 6   | 50.05                     | 50.05            | 52.45                  |
|                                                                | 6a  | 50.08                     | 50.10            | 52.60                  |
|                                                                | 7   | 50.20                     | 50.20            | 52.74                  |
|                                                                | 8   | 50.80                     | 50.85            | 52.87                  |
|                                                                | 8a  | 51.20                     | 51.20            | 52.85                  |
| Formalised fabriform channel within the site                   | 9   | 48.00                     | 48.16            | 49.50                  |
|                                                                | 10  | 47.20                     | 47.28            | 49.02                  |
|                                                                | 11  | 47.08                     | 47.14            | 48.92                  |
|                                                                | 12  | 47.06                     | 47.13            | 48.89                  |
| Fabriform channel to the north (McBarron Ck).                  | 13  | 48.88                     | 48.88            | 49.82                  |
|                                                                | 14  | 47.03                     | 47.09            | 48.85                  |
|                                                                | 15  | 46.04                     | 46.12            | 47.50                  |
|                                                                | 16  | 45.85                     | 45.86            | 47.50                  |
|                                                                | 17  | 45.78                     | 45.83            | 47.50                  |
|                                                                | 18  | 45.78                     | 45.83            | 47.96                  |
| Culverston Road                                                | 19  | 46.27                     | 46.26            | 48.38                  |
|                                                                | 20  | 46.50                     | 46.50            | 48.47                  |
|                                                                | 21  | 48.00                     | 48.12            | 48.51                  |



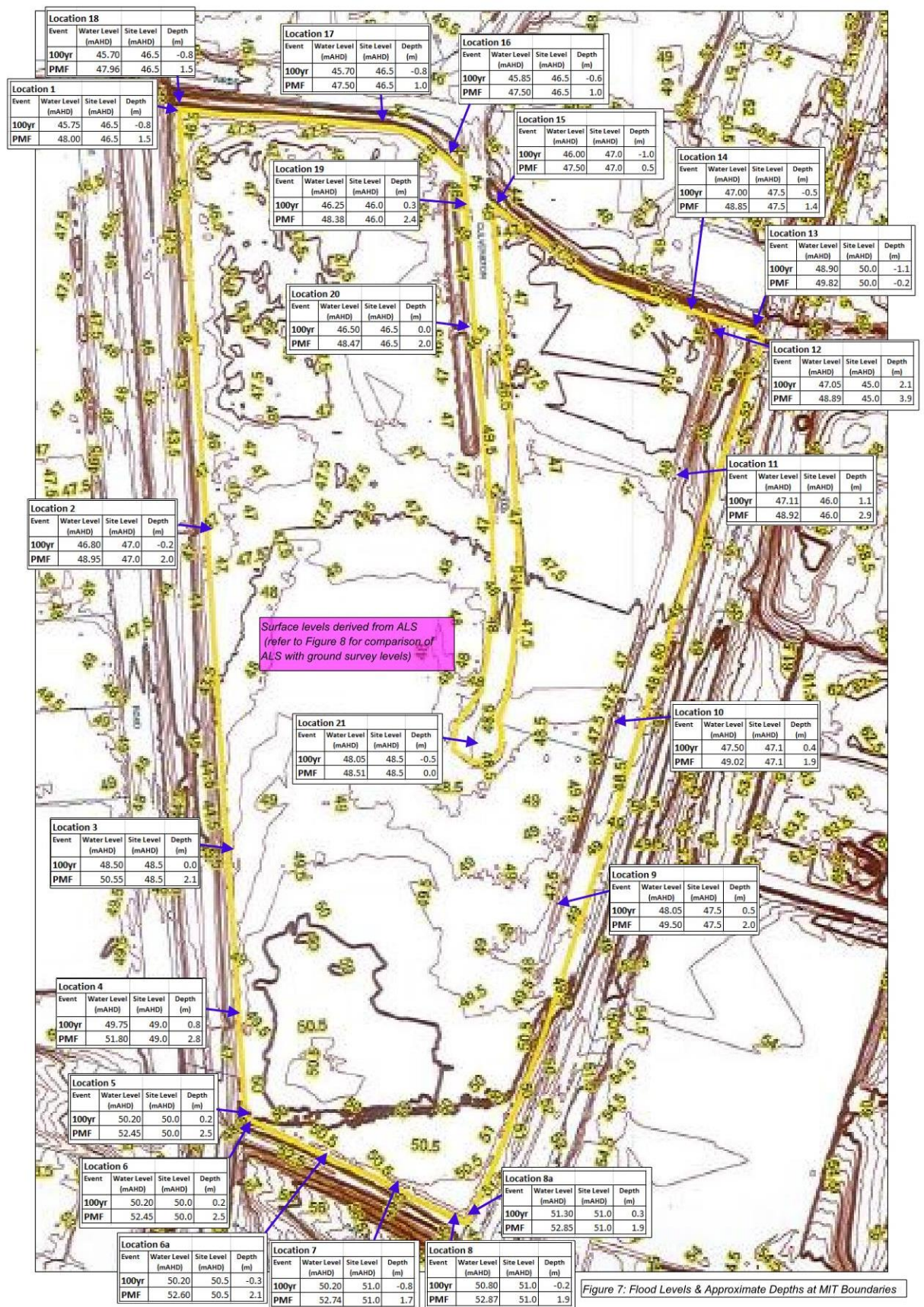


Figure 7: Flood Levels &amp; Approximate Depths at MIT Boundaries

Figure 4.3. 1% AEP and PMF Flood Levels and Depth

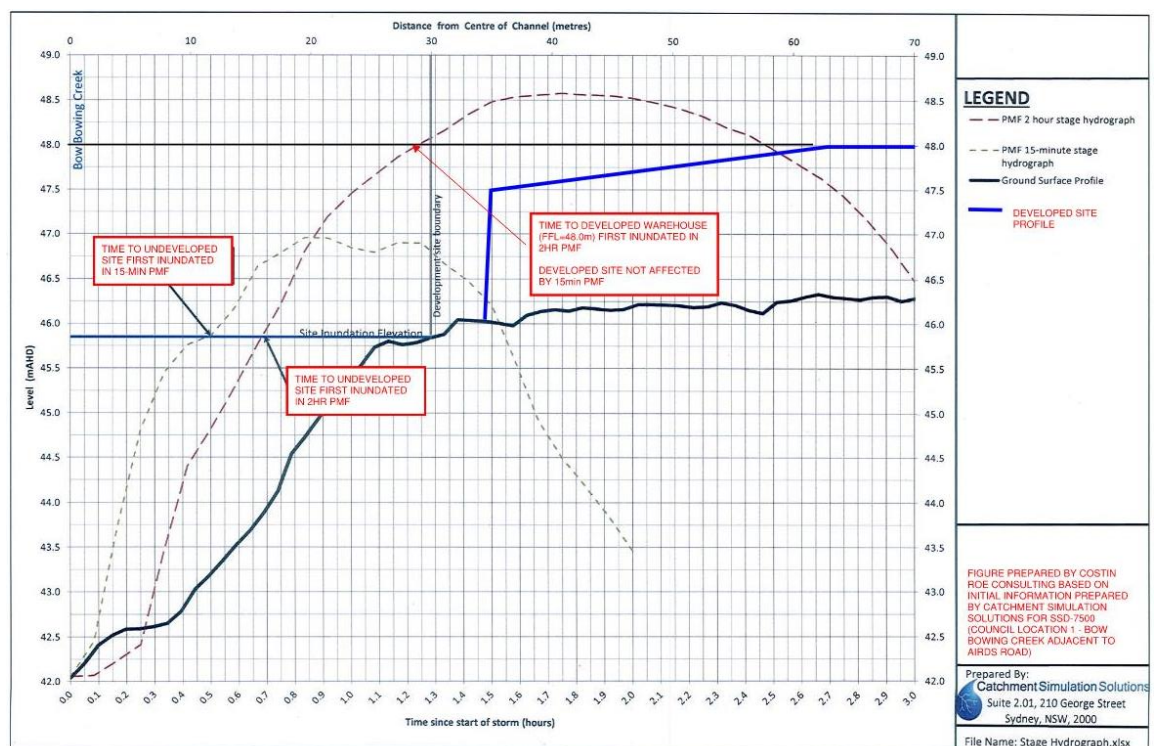
### 4.3 Rate of Rise and Flood Timing

The recommended flood measures and triggers to be adopted on site will be dependent on BOM warning systems in conjunction with water levels within the surrounding watercourses, in particular Bow Bowling Creek, and how they relate to levels within the development site.

As the catchment is relatively small, the rate of rise (and conversely the falling limb) will generally occur over a short period for most flood events.

**Figure 4.4** shows the stage water levels for floodwater in the extreme event at *Location 1* (per **Figure 4.2** and *Location 5* per *Catchment Simulation Solutions*). Figure 4.4 is based on information extracted from Councils regional flood model and provided by Councils regional flood modellers *Catchment Simulation Solutions* (refer letter dated 29 March 2016 in **Appendix B**). The original figure is noted to be modified to include the developed profile and adjusted time of inundation based on the developed conditions.

The approximate maximum rate of rise for the PMF flood events is 5.0 m/hr. The time of inundation could be up to 30 minutes. External roadways, being at lower levels than the site, could be impacted for 1 to 1.5hrs.



**Figure 4.4. Staged Water Levels for the Extreme (PMF) Storm Event**

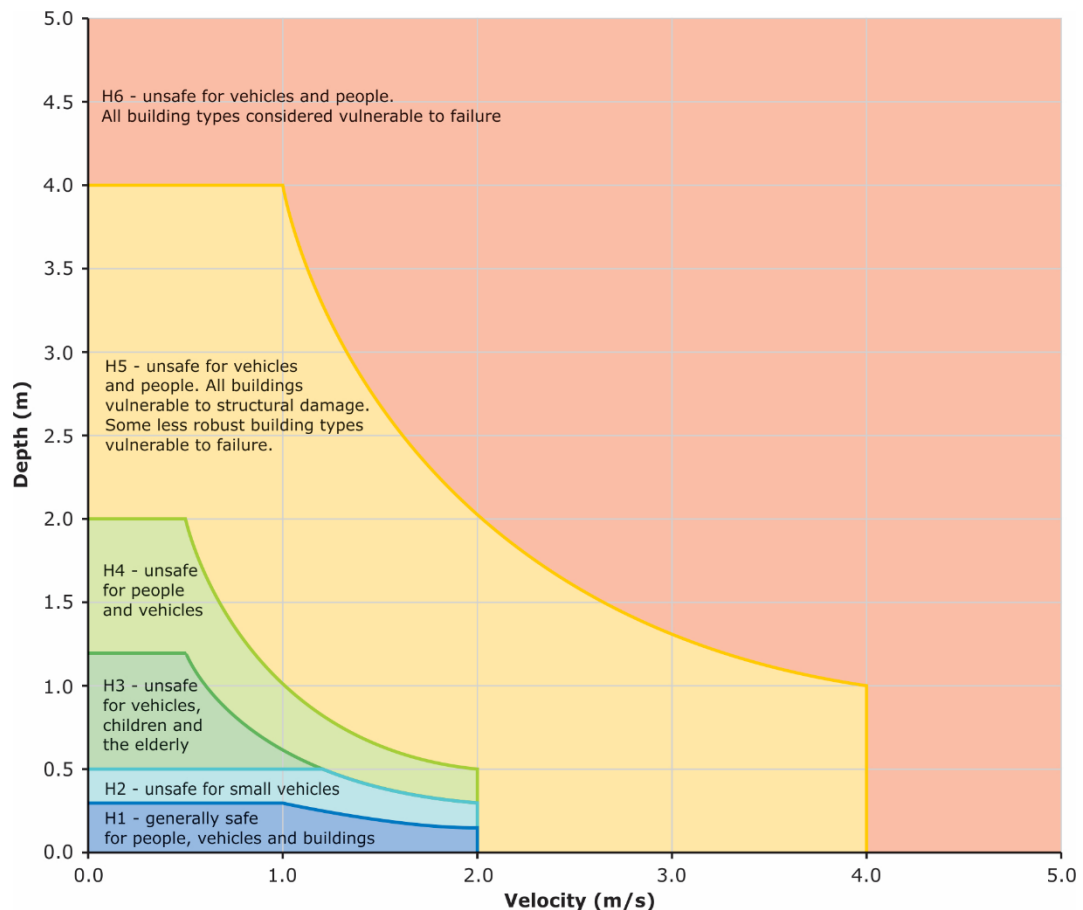


## 5 HAZARD CATERGORIES

### 5.1 Introduction

Flood hazard categories are broken down into H1 to H6 categories depending on depth and velocity, and their interaction with each other as set out in **Figures 5.1a** and **5.1b**.

Flood hazard criteria and mapping has been completed for the 1% AEP and PMF post development conditions as per criteria set out in the *Australian Rainfall and Runoff (2019)*, *A Guide to Flood Estimation – Book 6 – Flood Hydraulics* and *Figure 6.7.9* as included as **Figure 5.1** below.



**Figure 5.1a. Provisional Flood Hazard Chart (AR&R 2019)**

Table 6.7.3. Combined Hazard Curves - Vulnerability Thresholds (Smith et al., 2014)

| Hazard Vulnerability Classification | Description                                                                                                                   |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| H1                                  | Generally safe for vehicles, people and buildings.                                                                            |
| H2                                  | Unsafe for small vehicles.                                                                                                    |
| H3                                  | Unsafe for vehicles, children and the elderly.                                                                                |
| H4                                  | Unsafe for vehicles and people.                                                                                               |
| H5                                  | Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure. |
| H6                                  | Unsafe for vehicles and people. All building types considered vulnerable to failure.                                          |

Table 6.7.4. Combined Hazard Curves - Vulnerability Thresholds Classification Limits (Smith et al., 2014)

| Hazard Vulnerability Classification | Classification Limit (D and V in combination) | Limiting Still Water Depth (D) | Limiting Velocity (V) |
|-------------------------------------|-----------------------------------------------|--------------------------------|-----------------------|
| H1                                  | $D \cdot V \leq 0.3$                          | 0.3                            | 2.0                   |
| H2                                  | $D \cdot V \leq 0.6$                          | 0.5                            | 2.0                   |
| H3                                  | $D \cdot V \leq 0.6$                          | 1.2                            | 2.0                   |
| H4                                  | $D \cdot V \leq 1.0$                          | 2.0                            | 2.0                   |
| H5                                  | $D \cdot V \leq 4.0$                          | 4.0                            | 4.0                   |
| H6                                  | $D \cdot V > 4.0$                             | -                              | -                     |

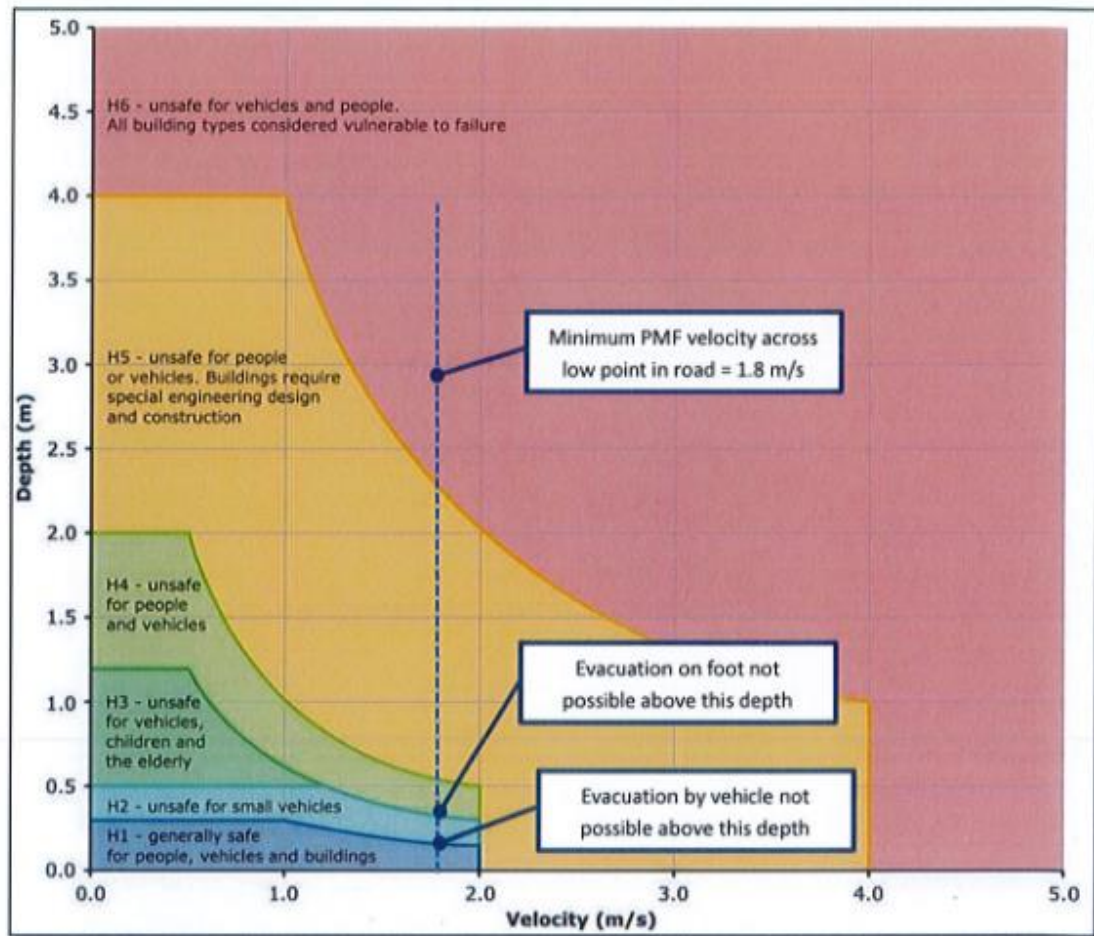
**Figure 5.1b. Adopted Hazard Criteria (AR&R 2019)**

## 5.2 Hazard Categorisation

Flood hazard criteria has been considered for the PMF event within Culverston Road as shown in **Figure 5.2 & 5.3**.

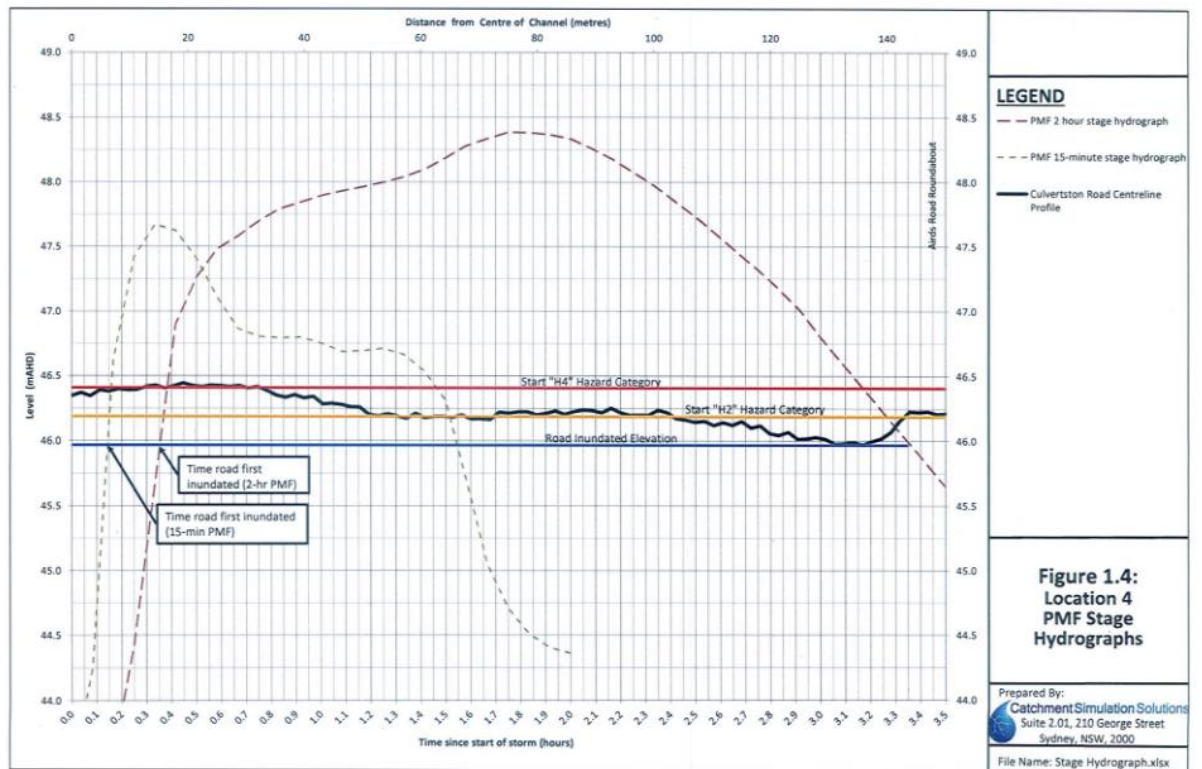
The assessment and hazard categorisation has been completed based on criteria set out in the *Australian Rainfall and Runoff (2019), A Guide to Flood Estimation – Book 6 – Flood Hydraulics* and *Figure 6.7.9*. The hazard categories are included as **Figure 5.1a** and **5.1b**.

As reported by Councils regional flood modellers *Catchment Simulation Solutions (CSS)* (refer letter dated 29 March 2016 in **Appendix B**), the flow velocity across Culverston Road is 1.8m/s, refer **Figure 5.2**.



**Figure 5.2. Culverston Road Flow Velocity and Hazard Criteria (per CSS)**

**Figure 5.3** shows that Culverston Road is inundated for up to 3 hours and has unsafe hazard categorisation for much of that time. Traversing or egress of Culverston Road, once inundated is not recommended. Refer **Sections 6 & 7** for further discussion.



**Figure 5.3. PMF Stage Water Levels and Hazard Cat. At Culverston Rd.**

## 6 FLOOD SAFETY AND EVACUATION

### 6.1 Introduction

This section of the report presents the relevant information in relation to egress and evacuation during the approach of a significant flood event. The information in this report can be used as a framework for the overall precinct and for future more detailed emergency response plans for individual facilities.

This framework has been completed with consideration to the State Emergency and *Rescue Management Act 1989* (NSW), the *State Emergency Service Act 1989* (NSW), and the *Campbelltown City Local Flood Plan 2015* (refer **Appendix D**) which includes the Bow Bowing Creek Catchment.

Based on typical light industrial population rates of 1 employee per 200m<sup>2</sup> GFA, it is expected that approximately 150 people will occupy the Stage 1 & 2 warehouses following completion of the development.

### 6.2 Flood Extent and Timing

The flood behaviour, including flood levels and timing (refer **Figure 4.5**), for the various events and the PMF event is included in **Section 4** of this FERP. The site is noted to be higher than the 1% AEP flood level plus 0.5m freeboard hence has a low residual risk of being inundated frequently.

### 6.3 Preparedness

#### Development of Warning Systems

Each of the Stage 1 and 2 facilities should have a facility specific plan which sets out flood warden, evacuation zones and responsible persons. During Construction, a responsible person (EM or site manager) is to be assigned who understands the flood behaviour of the area, is familiar with this report and flood management responses set out in the FERP.

The NSW SES Local Controller is responsible for monitoring the flood risk over the broader area and for issuing flood warnings to the community. Any person or group occupying the precinct at the time of flood danger should adhere to any warnings issued. The warning message will normally be issued via SMS (phone text) by the SES, and flood alerts would also be provided by the BOM prior to SES flood warning. During periods of heavy or forecast heavy rainfall it is important that one or some of the occupants of a facility should be able to receive such messages. The occupants must then immediately follow the flood evacuation plan in this report or the instructions of the SES controller in the area.

As described below, the SES Warning System is based on predicted rainfall and gauges on the Georges River basin. This river does not directly influence flood levels within Bow Bowing Creek adjacent to the precinct and supplementary information specific to the site should be used for individual flood management plans. The BOM/ SES system will provide good initial guidance, however in addition to the SES flood warning system, it is recommended that monitoring of real time gauges within Bow Bowing Creek and Bunbury Curran Creek be employed to supplement the BOM warnings.

Flood warning and emergency response for the development site will be based on the flood behaviour within surrounding watercourses and rainfall. Whilst it is understood there is no formal flood warning system on these watercourses, there are existing water level and rainfall gauges relevant to the catchment. These gauges include:

- Water level – Bow Bowling Ck. at Redfern Rd Stn. 568145 (Georges River Basin)
- Water level – Bunbury Curran Ck. at Railway Pde Stn. 567088 (Georges River Basin)
- Rainfall – Horsley Park Equestrian AWS BoM Stn. 067119

Real-time data (updated at 15-minute intervals) for these sites can be accessed through the BoM website via the following hyperlink:

<http://www.bom.gov.au/nsw/flood/greatersydney.shtml> .

### Preparation Steps

It is the responsibility of the occupants of each facility to understand the risks and dangers of flooding across the precinct, and the need to evacuate in such an event.

It is recommended that the users of each facility are registered to be able to receive flood warning messages via SMS from the NSW SES.

Lastly, the evacuation framework, including the evacuation route, contained in this report must be understood and adapted to each specific facility. It is recommended that a copy or copies of this route and plan are kept at several locations on site such as the maintenance manager, and office administrator. A thorough understanding of the *SES/ Council Local Flood Plan*, as included in **Appendix D** of this report, should also be made.

It is noted that significant lead warning time would not be required to enable effective flood response plans to be initiated for this site. The freeboard set at 0.5m above the 1% AEP means that all sites are at a level higher than the PMF level and are not flood affected, meaning that safe refuge in major flood events associated with the surrounding waterways is always available.



## 7 FLOOD RESPONSE

### 7.1 Flood Response Introduction

The following sub-sections of the report provide information on flood rate of rise, timing and potential flood triggers that could be utilised by future facility owners (during operation) or by site management (during construction) to be able to prepare their own flood response plans.

The theoretical rate of rise of flood water within Bow Bowing Creek is shown in **Figure 4.5**. The real-time rate of rise can be reviewed directly via the BOM river gauges in Bow Bowing Creek and Bunbury Curran Creek as listed in **Section 6.3** (noting these levels do not correspond to AHD).

### 7.2 Response Triggers

#### 1. **Trigger 1 - A flood alert/watch/advice is issued by the BOM.**

A Flood Watch is a notification of the potential for a flood to occur as a result of a developing weather situation and consists of short, generalised statements about the developing weather including forecast rainfall totals, description of catchment conditions and indicates streams at risk. The Bureau will also attempt to estimate the magnitude of likely flooding in terms of the adopted flood classifications. Flood Watches are normally issued 24 to 36 hours in advance of likely flooding. Flood watches are issued on a catchment wide basis.

A Flood Watch notification provides an early warning that flooding may occur, however is not confirmation that flooding will occur. If this alert is issued then the Flood Warden should be on alert for further BOM, SES or site-specific Triggers.

#### 2. **Trigger 2 – General flood alert issued by the BOM.**

A generalised flood warning would be issued when flooding is expected to occur in a given area. These would generally be provided by the BOM (with approximately three hours warning time is expected) from issue of warning to peak flood level as per the “*Service Level Specification for Flood Forecasting and Warning Services for New South Wales – Version 2.0*” (Bureau of Meteorology, 2013).

It is noted that *Trigger 3* may occur prior to *Trigger 2* and the Flood Warden is required to consider this eventuality.

#### 3. **Trigger 3 - Site flood level gauge achieves flood level in Bow Bowing Creek of 3m.**

This would allow for 30min to evacuation level in a PMF event.

Flood Warden at this point should put building occupants on alert to evacuate or move to on-site refuge with follow up in 1hr or *Trigger 4* being met. Flood warden to contact SES for additional updates and confirmation of road closures.

**4. Trigger 4 – Flood Level is within 0.5m below the Airds Road Bridge Crossing, or >0.3m in Culverston Road or other surrounding roads.**

Flood warden should advise occupants or remaining occupants to move to on-site flood refuge zone. No further vehicular evacuation would be recommended.

Additional directions and confirmation of safety measures from SES to be sought.

Once the Bow Bowing Creek flood height reaches the nominated flood level then warnings will be distributed to all occupiers of the facilities at the time of the warning.

**Table 7.1** provides information relating to differing AEP storm events, SES warnings and the status of the vehicular evacuation route. It is noted that there is no direct correlation data published between AEP events and the SES flood warning levels within the Campbelltown City Council.

| <b>Design Flood (AEP)</b> | <b>Flood Warning (BOM/SES)</b> | <b>Predicted Flood Level at Site<sup>^</sup> (m)</b> | <b>Status of Evacuation Route</b>                          |
|---------------------------|--------------------------------|------------------------------------------------------|------------------------------------------------------------|
| -                         | Minor                          | -                                                    | Not Impacted                                               |
| -                         | Moderate/<br>Level 1           | -                                                    | Not Impacted                                               |
| -                         | Major/<br>Level 2              | -                                                    | Potentially Impacted                                       |
| 20%                       | -                              | 44.5                                                 | Not Impacted                                               |
| 5%                        | -                              | 44.8                                                 | Not Impacted                                               |
| 2%                        | -                              | 45.25                                                | Not Impacted                                               |
| 1%                        | -                              | 45.9                                                 | Not Impacted, though impacted shortly after. <sup>^^</sup> |
| PMF                       | -                              | 48.0                                                 | Cut                                                        |

**Table 7.1. Flood Route Evacuation Status**

<sup>^</sup>: AEP Level taken at upstream end of precinct adjacent to Airds Road bridge crossing of Bow Bowing Creek to nearest 0.1m

<sup>^^</sup>: Culverston Road will be inundated at approximately RL 56.0m AHD.

**Response Strategies**

Following the appropriate warning message or response trigger, response operations should commence. The response requirement for each facility on site would be highly dependent on the specific user and potential of damage from flooding. Normally the response would begin with necessary property protection for each facility. Typical measures could include sandbagging, moving any furniture, machinery or stock that may be affected by flood waters of level greater than flood planning levels. As noted, all developed land has been sited at the 1% AEP flood level plus 0.5m freeboard or higher, so the probability of occurrence

is low and individual plans should be made for each facility to ensure the response measures meet the requirements of that facility.

Occupants are to be mobilised with the level of importance and urgency corresponding to the flood risk. High flood risk areas must be evacuated before medium risk, and finally low risk areas, in line with the Triggers listed earlier in this section of the report.

The preferred evacuation route from the precinct is to be made to the M31 Motorway or as directed by SES.

The transport by which the affected occupants travel along the evacuation route is private vehicle. If one does not own a private vehicle, then on-site refuge is recommended. However, in the event that flood waters have encroached the flood evacuation route, it is important SES warning and road detours are followed. It is recommended that under no circumstances should flood waters be driven through, noting vehicles can be swept away by flood water at depths of only 200mm. On-site refuge is recommended in this instance within the particular facility being occupied which is free from flooding, or other area above the South Creek PMF flood event water level.

#### End of Response Operations

Once the flood levels recede below the trigger level and the danger posed by flooding has passed, the NSW SES Liverpool or Campbelltown Local Controller will issue an “all clear” message which will be conveyed in the same format as the warning message, via SMS. Building occupiers can then leave the precinct if on site refuge was undertaken, or return to the precinct if evacuated.

## **8 CONCLUSION**

Costin Roe Consulting Pty Ltd has been commissioned to develop this FERP for the industrial Stage 1 & 2 development approved under SSD-7500 MOD1 at Culverston Road, Minto, NSW.

The report provides a summary of flood behaviour of local and regional flooding which affects the site, and the different conditions which cause flooding on the site. Flood preparedness and response techniques have been clarified, including warning triggers and distribution and evacuation route and transport. Effective egress paths have been nominated to improve the safe evacuation of users and visitors of the existing and proposed facilities in the event of major rainfall and/or flooding.

## 9 REFERENCES

NSW Floodplain Management Manual 2005

OEH 2007, *Floodplain Risk Management Guidelines*

SES (2015) Campbelltown City Council Flood Sub Plan

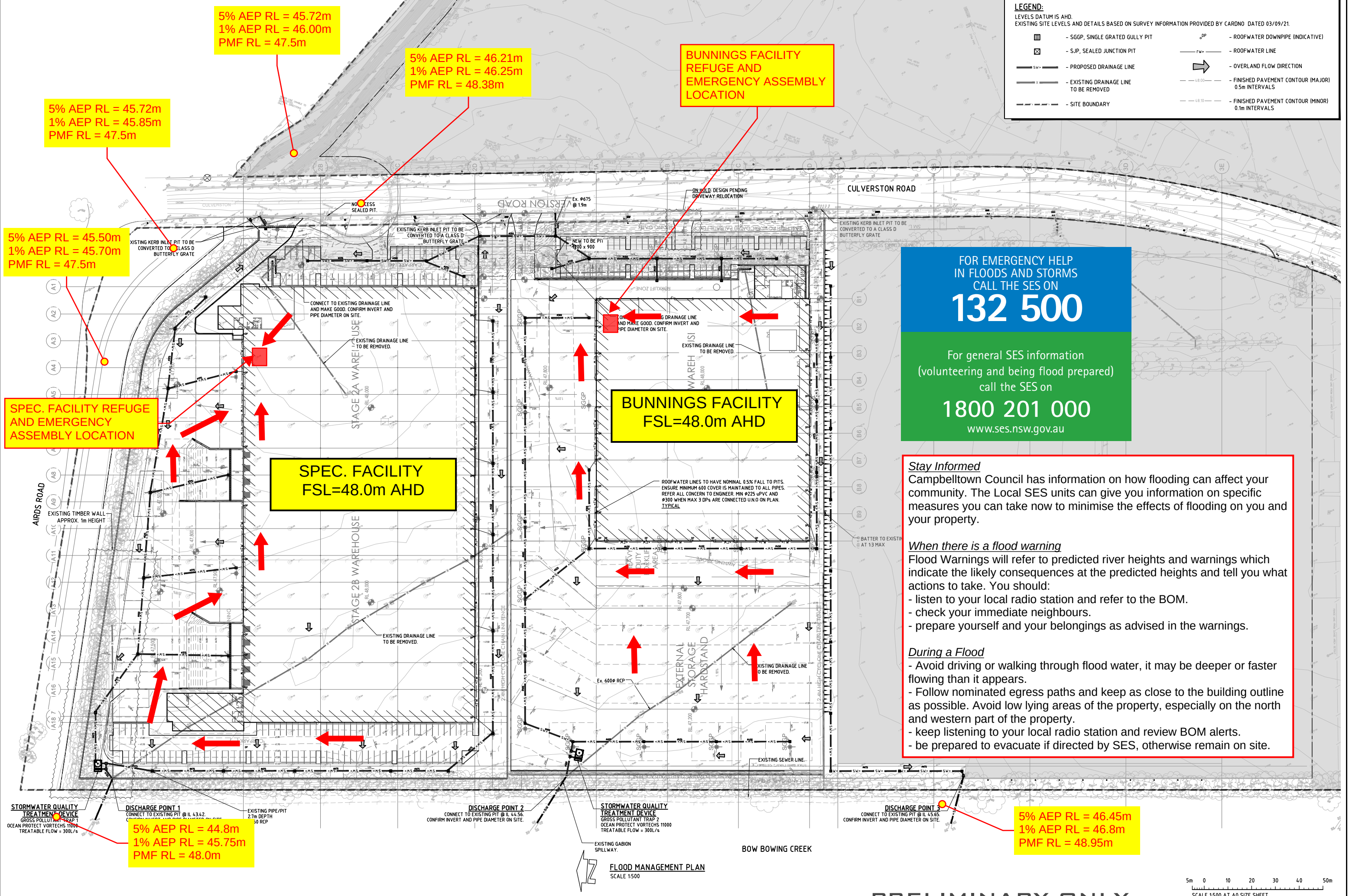
SES (2018). *Provision of and Requirements for Flood Warning*

Bureau of Meteorology (2013). *Service Level Specification for Flood Forecasting and Warning Services for New South Wales – Version 2.0*”

**APPENDIX A**  
**COSTIN ROE CONSULTING DRAWING**

**LEGEND:**  
LEVELS DATUM IS AHD.  
EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY CARDNO DATED 03/09/21.

|  |                                        |  |                                                    |
|--|----------------------------------------|--|----------------------------------------------------|
|  | - SGGP, SINGLE GRATED GULLY PIT        |  | - ROOFWATER DOWNPIPE (INDICATIVE)                  |
|  | - SJP, SEALED JUNCTION PIT             |  | - ROOFWATER LINE                                   |
|  | - PROPOSED DRAINAGE LINE               |  | - OVERLAND FLOW DIRECTION                          |
|  | - EXISTING DRAINAGE LINE TO BE REMOVED |  | - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS |
|  | - SITE BOUNDARY                        |  | - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS |



5% AEP RL = 45.50m  
1% AEP RL = 45.70m  
PMF RL = 47.5m

5% AEP RL = 45.72m  
1% AEP RL = 46.00m  
PMF RL = 47.5m

5% AEP RL = 46.21m  
1% AEP RL = 46.25m  
PMF RL = 48.38m

BUNNINGS FACILITY  
REFUGE AND  
EMERGENCY ASSEMBLY  
LOCATION

SPEC. FACILITY REFUGE  
AND EMERGENCY  
ASSEMBLY LOCATION

SPEC. FACILITY  
FSL=48.0m AHD

BUNNINGS FACILITY  
FSL=48.0m AHD

FOR EMERGENCY HELP  
IN FLOODS AND STORMS  
CALL THE SES ON  
**132 500**

For general SES information  
(volunteering and being flood prepared)  
call the SES on  
**1800 201 000**  
[www.ses.nsw.gov.au](http://www.ses.nsw.gov.au)

**Stay Informed**  
Campbelltown Council has information on how flooding can affect your community. The Local SES units can give you information on specific measures you can take now to minimise the effects of flooding on you and your property.

**When there is a flood warning**  
Flood Warnings will refer to predicted river heights and warnings which indicate the likely consequences at the predicted heights and tell you what actions to take. You should:

- listen to your local radio station and refer to the BOM.
- check your immediate neighbours.
- prepare yourself and your belongings as advised in the warnings.

**During a Flood**

- Avoid driving or walking through flood water, it may be deeper or faster flowing than it appears.
- Follow nominated egress paths and keep as close to the building outline as possible. Avoid low lying areas of the property, especially on the north and western part of the property.
- keep listening to your local radio station and review BOM alerts.
- be prepared to evacuate if directed by SES, otherwise remain on site.

5% AEP RL = 44.8m  
1% AEP RL = 45.75m  
PMF RL = 48.0m

5% AEP RL = 46.45m  
1% AEP RL = 46.8m  
PMF RL = 48.95m



**APPENDIX B**  
**Extreme Flood Assessment Letter (29 March 2016)**  
**Catchment Simulation Solutions**

7 April 2016



Mr Bruce Caldwell  
ARCADIS  
Level 5/141 Walker Street  
**NORTH SYDNEY NSW 2060**

bruce.caldwell@arcadis.com

Dear Mr Caldwell

**Lot 3 DP 817793 (No. 5) and Lot 400 DP 875711 Culverston Road Minto- Flood information.**

Council refers to your letter dated 15 February 2016 requesting flood information for the above properties.

I advise as follows:

1. The above properties are at risk of flooding from a 1% Annual Exceedance Probability (AEP) flood in the Bow Bowing creek to the west, fabriform channel to the north (by the side of Airds Road) and formalised channel to the south (by the side of Rose Payten Drive).

The above properties are affected by flooding from a 1% Annual Exceedance Probability flood due to overland flow from the local catchment traversing lot in the formalised fabriform channel within the site.

2. The minimum fill (1% AEP flood level) and floor level requirement due to 1% AEP flooding in addition to the 20%, 5% and 2% AEP and PMF flood levels are given on the attached table (page 3) corresponding to the locations shown on the attached map (page 4). Please note that the 1% AEP flood levels have been provided for two scenarios. The first assumes that the site is in its current landform. The second assumes that the site has been (and all developable areas in the catchment are) filled to 10m above current levels. This forces all water into the roads, drains, creeks and open space areas and represents the "ideal" development scenario.
3. Please refer to Attachment No.1 for the details of the Culverston Road Box culvert.
4. Please refer to Attachment No. 2 for the contour plans on cadastral/aerial photo base and Council's stormwater network details as requested.
5. Your receipt for payment is enclosed (Attachment No.3).
6. With regard to the blockage factors used in Council Flood study please refer to the extract from the flood study report given below for your information.

### 5.2.5 Pit/Culvert Blockage

As shown in **Plate 7**, stormwater inlets and culverts may become blocked by debris during the course of a flood. As a result, most stormwater inlets and culverts will not operate at full efficiency during most floods. This can increase the severity of flooding across areas located adjacent to this drainage infrastructure.

In recognition of the potential for blockage to occur during a flood, blockage factors were applied to stormwater inlets and culverts. A blockage factor of 50% was applied to all minor (i.e., < 3 metre diameter) culvert crossings. A 50% blockage factor was also applied to all sag stormwater inlets and 20% blockage was applied to on-grade stormwater inlets in accordance with Council's '*Sustainable City Development Control Plan 2009, Volume 2: Engineering Design for Development*' (DCP) (Campbelltown City Council, 2009b).

7. Please refer to attachment No. 4 for the report by Council's consultant in response to point 3 of your above letter.

Council trusts the above information is of assistance. Should you have any further queries, please contact Cathy Kinsey on (02) 4645 4635.

Yours sincerely



Kevin Lynch  
**Manager Technical Services**

*Attachment 1 - Culverston Road culvert details*

*Attachment 2 - Contour & stormwater network detail plans*

*Attachment 3 - Receipt for payment*

*Attachment 4 - Report by Council's consultant*

GH



## Table of flood levels at various locations.

| Detail of the flood way                                        | Location | 1% AEP flood level with current site ground levels [Min. Fill level] (m AHD) | Min. Floor level (m AHD) | 1% AEP flood level with site filled to above flood levels * (m AHD) | 20% AEP flood level (m AHD) | 5% AEP flood level (m AHD) | 2% AEP flood level (m AHD) | PMF (m AHD) |
|----------------------------------------------------------------|----------|------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------|-----------------------------|----------------------------|----------------------------|-------------|
| Bow Bowing Channel                                             | 1        | 45.75                                                                        | 46.25                    | 45.88                                                               | 44.50                       | 44.80                      | 45.25                      | 48.00       |
|                                                                | 2        | 46.80                                                                        | 47.30                    | 47.00                                                               | 46.10                       | 46.45                      | 46.60                      | 48.95       |
|                                                                | 3        | 48.50                                                                        | 49.00                    | 48.73                                                               | 47.80                       | 48.15                      | 48.33                      | 50.55       |
|                                                                | 4        | 49.75                                                                        | 50.25                    | 49.96                                                               | 49.10                       | 49.45                      | 49.60                      | 51.80       |
|                                                                | 5        | 50.20                                                                        | 50.70                    | 50.47                                                               | 49.50                       | 49.85                      | 50.05                      | 52.45       |
| Formalised grass channel to the south (Rose Payten Drive side) | 6        | 50.20                                                                        | 50.70                    | 50.54                                                               | 49.50                       | 49.85                      | 50.05                      | 52.45       |
|                                                                | 6a       | 50.20                                                                        | 50.70                    | 50.62                                                               | 49.70                       | 49.75                      | 49.79                      | 52.60       |
|                                                                | 7        | 50.20                                                                        | 50.70                    | 50.74                                                               | 50.10                       | 50.18                      | 50.19                      | 52.74       |
|                                                                | 8        | 50.80                                                                        | 51.30                    | 51.04                                                               | 50.70                       | 50.76                      | 50.78                      | 52.87       |
|                                                                | 8a       | 51.30                                                                        | 51.30                    | 51.22                                                               | N/A                         | 51.10                      | 51.21                      | 52.85       |
| Formalised fabriform channel within the site                   | 9        | 48.05                                                                        | 48.55                    | 48.54                                                               | 48.00                       | 48.00                      | 48.00                      | 49.50       |
|                                                                | 10       | 47.50                                                                        | 48.00                    | 48.00                                                               | 47.15                       | 47.24                      | 47.38                      | 49.02       |
|                                                                | 11       | 47.11                                                                        | 47.61                    | 47.75                                                               | 46.80                       | 46.86                      | 46.99                      | 48.92       |
|                                                                | 12       | 47.05                                                                        | 47.55                    | 47.63                                                               | 46.60                       | 46.83                      | 46.95                      | 48.89       |
|                                                                | 13       | 48.90                                                                        | 49.40                    | 48.90                                                               | 48.65                       | 48.75                      | 48.82                      | 49.82       |
| Fabriform channel to the north                                 | 14       | 47.00                                                                        | 47.50                    | 47.60                                                               | 46.50                       | 46.75                      | 46.88                      | 48.85       |
|                                                                | 15       | 46.00                                                                        | 46.50                    | 46.46                                                               | 45.45                       | 45.72                      | 45.89                      | 47.50       |
|                                                                | 16       | 45.85                                                                        | 46.35                    | 45.98                                                               | 45.40                       | 45.60                      | 45.72                      | 47.50       |
|                                                                | 17       | 45.70                                                                        | 46.20                    | 45.88                                                               | 45.30                       | 45.50                      | 45.61                      | 47.50       |
|                                                                | 18       | 45.70                                                                        | 46.20                    | 45.88                                                               | 44.55                       | 44.80                      | 45.22                      | 47.96       |
| Culverston Road                                                | 19       | 46.25                                                                        | 46.55                    | 46.47                                                               | 46.10                       | 46.21                      | 46.25                      | 48.38       |
|                                                                | 20       | 46.50                                                                        | 46.80                    | 46.60                                                               | 46.43                       | 46.46                      | 46.47                      | 48.47       |
|                                                                | 21       | 48.05                                                                        | 48.35                    | 48.20                                                               | 47.93                       | 48.02                      | 48.04                      | 48.51       |

Note: 1% AEP flood level at location 1 is due to back water from the downstream culvert.

\* All areas within the flood study area, other than roads, drainage, and open space, have been raised 10m above the current levels.



## Flood level locations





THE ACCURACY OF THE INFORMATION  
PROVIDED ON THIS DRAWING IS NOT  
GUARANTEED. ALL SERVICES TO BE  
CHECKED FOR LEVEL AND LOCATION.

**SIGNED**

DATE



SCANNED  
NOT TO SCALE

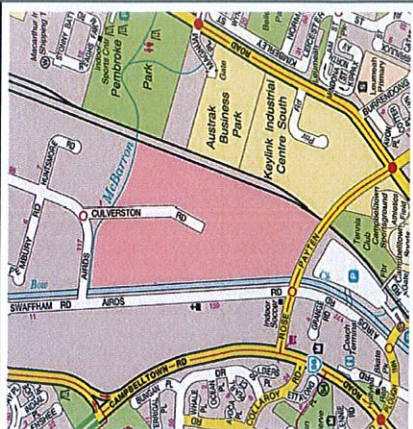




Accuracy of the information shown on this plan is not guaranteed.

**All service levels and locations should be confirmed on site.**

This information shall not be made public without the written permission of Council's Manager Technical Services.



Lot 3 DP817793 and Lot 400 DP875711  
Culverston Road Minto  
14 March 2016

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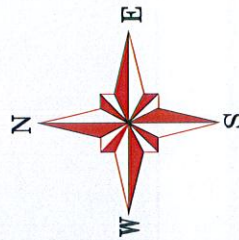
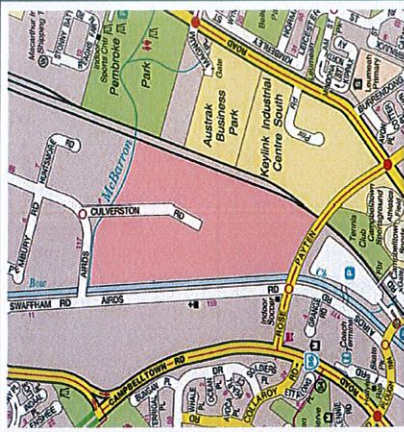






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Lot 3 DP817793 and Lot 400 DP875711  
Culverston Road Minto  
14 March 2016

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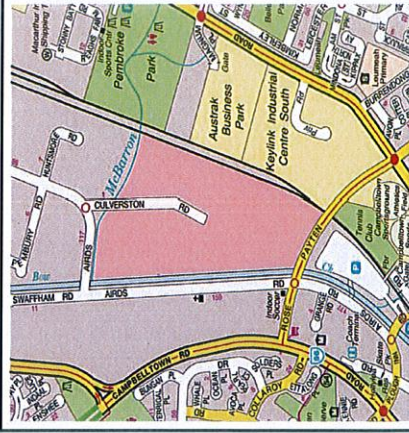


City services  
Level 2, 1000 Centre Street  
PO Box 171, Campbelltown NSW 2560

Accuracy of the information shown on this plan is not guaranteed.

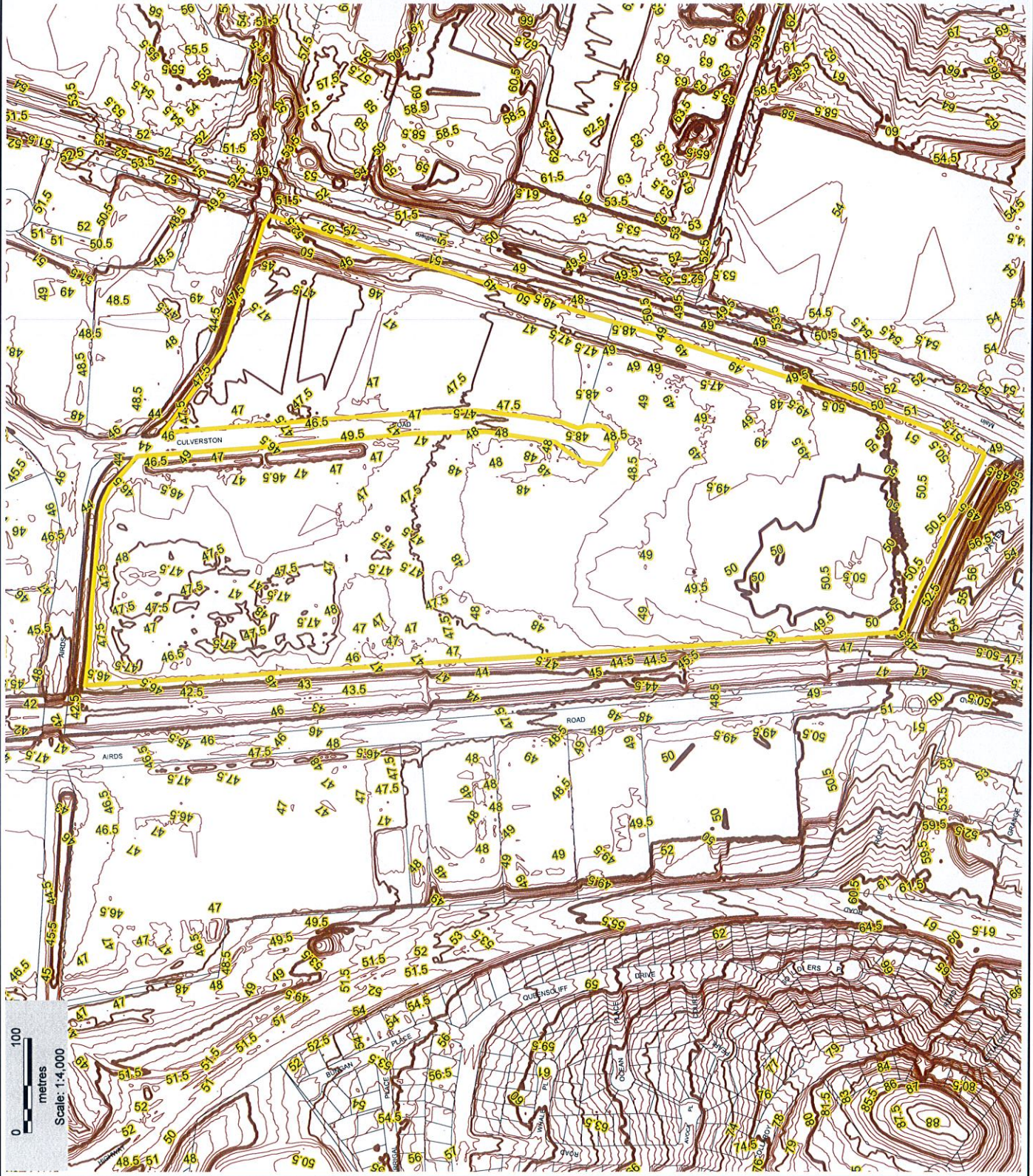
All service levels and locations should be confirmed on site.

This information shall not be made public without the written permission of Council's Manager Technical Services.



**Lot 3 DP817793 and Lot 400 DP875711**  
**Culverston Road Minto**  
**14 March 2016**

File :Stormwater\_Advice\_CulverstonMinto14March2016.vor







## Catchment Simulation Solutions

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(02) 8355 5505  
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Ms Gamini Hattotuwa  
**Campbelltown City Council**  
PO Box 57  
CAMPELLTOWN NSW 2560

29<sup>th</sup> March, 2016

Dear Gamini,

**Lot 3 DP 817793 & Lot 400 DP87511, Culverston Rd, Minto**  
**Extreme Flood Assessment**

I refer to recent correspondence regarding the proposed redevelopment of two lots adjoining Culverston Road at Minto (referred to as Lot 3 DP 817793 & Lot 400 DP87511). The location of the site is shown in **Figure 1**.

As you would be aware, the proposed development site is bordered by a number of open channels/waterways. Accordingly, there is potential for the site to be impacted by flooding during significant rainfall within the catchment. Therefore, we understand that ARCADIS has requested the provision of a range of "extreme flood" information to assist with the design of the proposed development. This includes:

- PMF warning times; and,
- Duration of PMF inundation across Culverston Road culvert, including duration of "high hazard" inundation.

Therefore, Catchment Simulation Solutions (CSS) has extracted Probable Maximum Flood (PMF) information from the results of TUFLOW modelling that was completed across the Minto/McBarron Creek catchment. The outcomes of this data extraction exercise is presented below.

### PMF Assessment

To assess the potential flood warning times that may be available during a PMF, stage hydrographs were extracted from the results of the Minto/McBarron Creek TUFLOW modelling. The stage hydrographs describe the time variation in water level throughout the PMF at discreet locations. The location where stage hydrographs were extracted as part of the assessment is shown in **Figure 1** and includes:

- #1 - Swale near south-western corner of the site (i.e., downstream of railway);
- #2 - Bow Bowing Creek channel at south-western corner of site (i.e., downstream of Rose Payten Drive);
- #3 McBarron Creek near north-western corner of site (i.e., downstream of railway); and,
- #4 - Upstream of Culverston Road Culvert;



● #5 - Bow Bowing Creek channel at north-western corner of site (i.e., upstream of Airds Road)

A review of multiple PMF storm durations was completed to determine the storm durations that would provide the shortest flood warning times as well as the greatest durations of inundation. The stage hydrographs for the 15-minute and 2-hour PMF storm durations were selected for inclusion as:

- The 15-minute storm provides the least amount of warning time while still causing inundation across the site.
- The 2-hour storm duration produces the greatest duration of inundation across Culverston Road.

The stage hydrographs at locations #1 to #5 are provided in **Figures 1.1 to 1.5**.

Also included on a secondary axis in **Figures 1.1 to 1.5** are cross-sections that show the variation in ground surface in the vicinity of each stage hydrograph location. The alignment of each cross-section is shown on **Figure 1**. The cross-section information can be used to determine the elevation at which water would begin to “spill” from the waterways and start to enter the site or cross Culverston Road. This, in turn, can be correlated with the PMF stage hydrographs to determine the amount of warning time that would be available after the initial onset of rainfall before this threshold elevation is exceeded and inundation of the site/road would commence.

The time of first inundation after the initial onset of rainfall at each stage hydrograph location is also summarised in **Table 1**. It should be noted that the warning times are estimates only based upon interrogation of 5 locations around the perimeter of the site. There is potential for inundation of the site during the PMF at other locations at other times. Therefore, the calculated warning times should be considered estimates only.

**Table 1 Inundation Times from Onset of Initial Rainfall**

| Location | Time from Onset of Rainfall (minutes) |            |
|----------|---------------------------------------|------------|
|          | 15-minute PMF                         | 2-hour PMF |
| 1        | 8                                     | 16         |
| 2        | 31                                    | 44         |
| 3        | 9                                     | 22         |
| 4        | 8                                     | 21         |
| 5        | 29                                    | 41         |

**Table 2 Duration of Inundation for Culverston Road**

| Location | Duration of Inundation (hours) |            | Duration of >H1 Inundation (hours) |            | Duration of >H3 Inundation (hours) |            |
|----------|--------------------------------|------------|------------------------------------|------------|------------------------------------|------------|
|          | 15-minute PMF                  | 2-hour PMF | 15-minute PMF                      | 2-hour PMF | 15-minute PMF                      | 2-hour PMF |
| 4        | 1.4                            | 3.0        | 1.35                               | 2.9        | 1.3                                | 2.8        |



The information presented in **Figures 1.1 to 1.5** and **Table 1** shows that:

- Along the main Bow Bowing Creek channel, inundation of the site would occur around 30 minutes after the initial onset of rainfall during a 15-minute PMF. During the 2-hour PMF, inundation of the site would typically occur 40 minutes after the initial onset of rainfall.
- Along the tributaries bordering the northern and southern site boundaries, inundation of the site would commence less than 10 minutes after the initial onset of rainfall during the 15-minute PMF. Inundation of the site would generally occur 20 minutes after the initial onset of rainfall during a 2-hour PMF.

It is noted that an elevated embankment is provided around some sections of the site, which would afford some additional protection across the central sections of the site. However, in most cases, this will only afford an additional ~5 minutes of warning time.

The receding limb of the hydrograph was also interrogated at Culverston Road to determine how long the road would remain inundated. This information is presented in **Figure 1.4** and **Table 2** and shows:

- Inundation of Culverston Road will occur ~10 minutes after the initial onset of rainfall and will remain inundated for approximately 1.5 hours during the 15-minute PMF.
- Inundation of Culverston Road will occur ~20 minutes after the initial onset of rainfall during the 2-hour PMF and will remain inundated for approximately 3 hours.

The outputs from the TUFLOW model were also interrogated to determine the period that Culverston Road would be exposed to a high flood hazard (i.e., where evacuation from the site along Culverston Road would not be possible). For the purposes of this assessment, the duration of “high hazard” inundation was defined based upon hazard definitions presented in the Australian Government’s *Technical Flood Risk Management Guideline: Flood Hazard* (2014). The hazard categories are reproduced in **Plate 1** and quantify the potential vulnerability of people, cars and structures based upon the depth and velocity of floodwaters at a particular location.

As shown in **Plate 1**, floodwater depths and velocities within the “H2” category (or higher) would mobilise small vehicles (i.e., evacuation by vehicles would not be possible) and the floodwater depths and velocities within the “H4” category (or higher) would be dangerous to able bodies adults (i.e., evacuation on foot would not be possible). Accordingly, the peak PMF velocities and depths were interrogated to determine the water level at which both of these hazard categories would be initiated, which is superimposed on **Figure 1.4**. This information, was then used to determine the duration that the roadway would be exposed to a hazard categorisation equal to or greater than the H2 and H4 designation. This information is summarised in **Table 2**.

As shown in **Table 2**, vehicular evacuation along Culverston Road unlikely to be possible for a period of between 1.35 and 2.9 and evacuation on foot is unlikely to be achievable for a period of between 1.3 and 2.8.



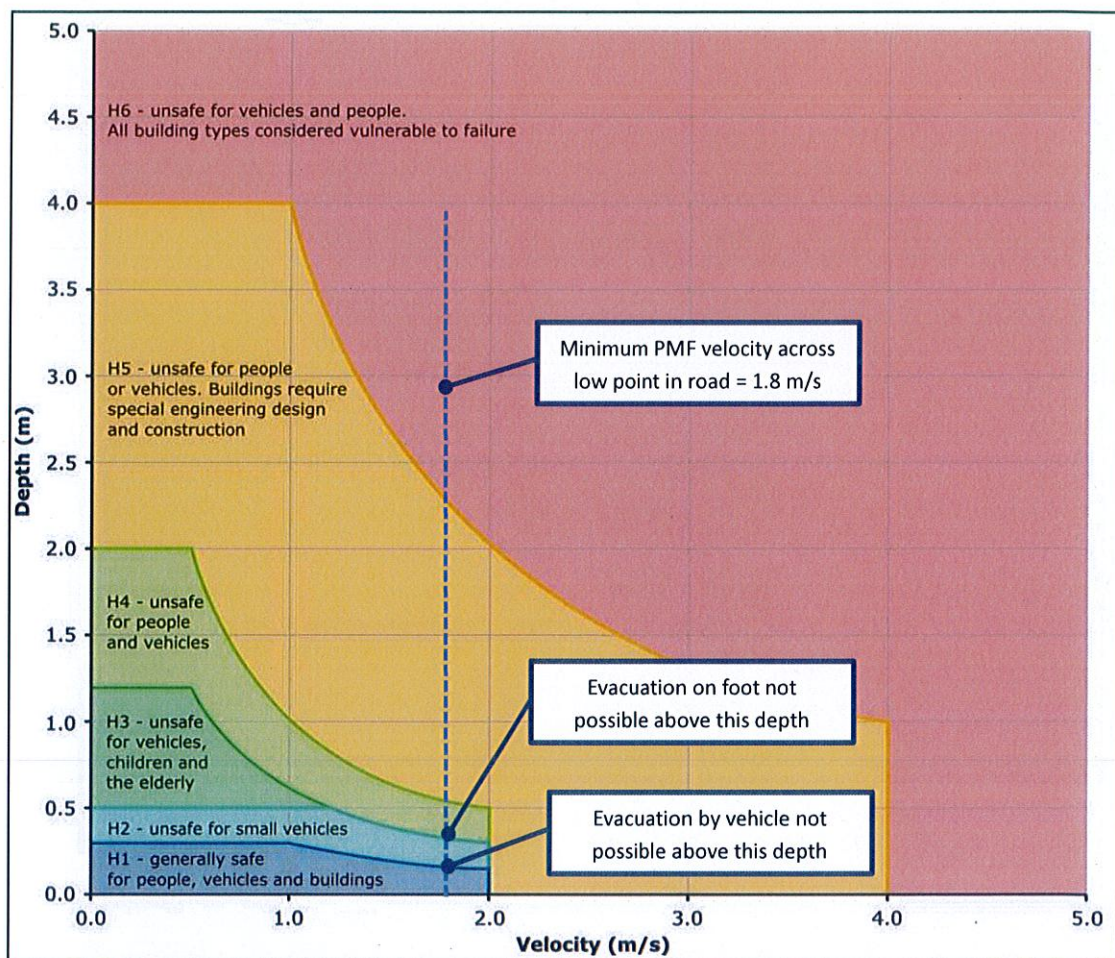


Plate 1 Flood hazard vulnerability curves (Australian Government, 2014)

We trust that the above report suitably summarises the outcomes of the extreme flood assessment. If you have any questions, please do not hesitate to contact the undersigned.

Kind Regards,

David Tetley

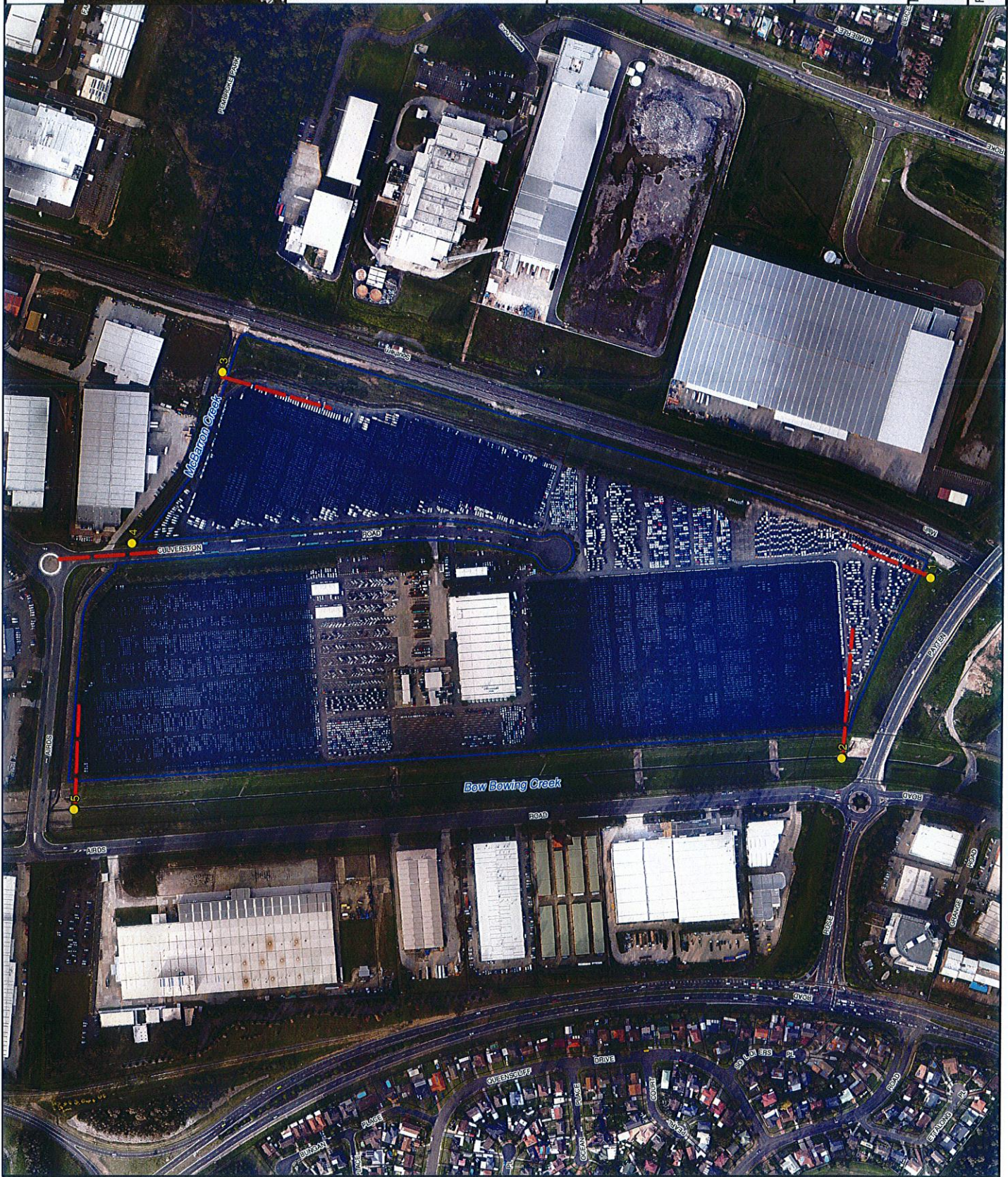
Catchment Simulation Solutions

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## Figures

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**LEGEND**

- Site Boundary
- Stage Hydrograph Location
- Cross Section Alignment

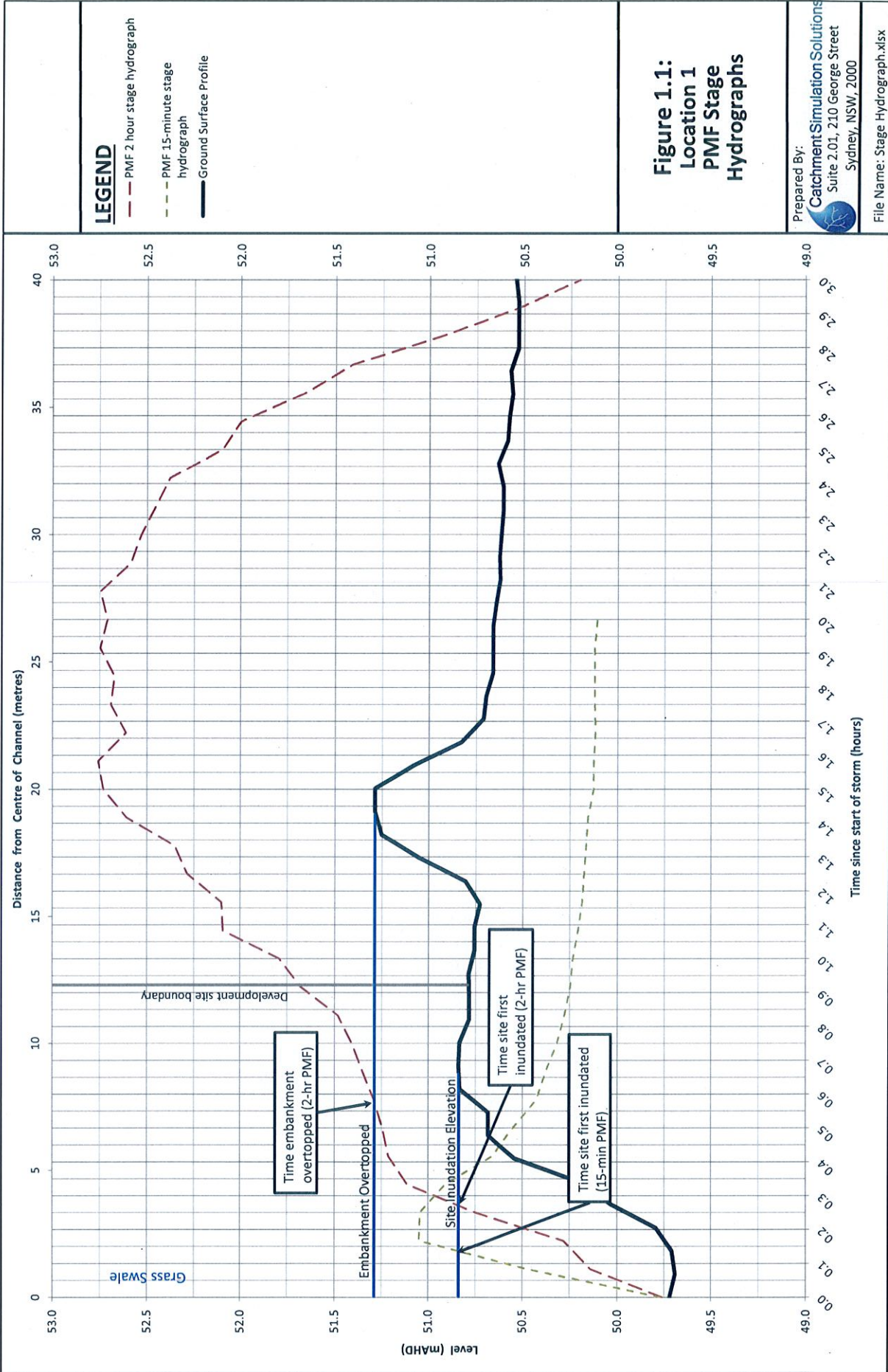
Notes:  
Aerial photo taken in 2014.

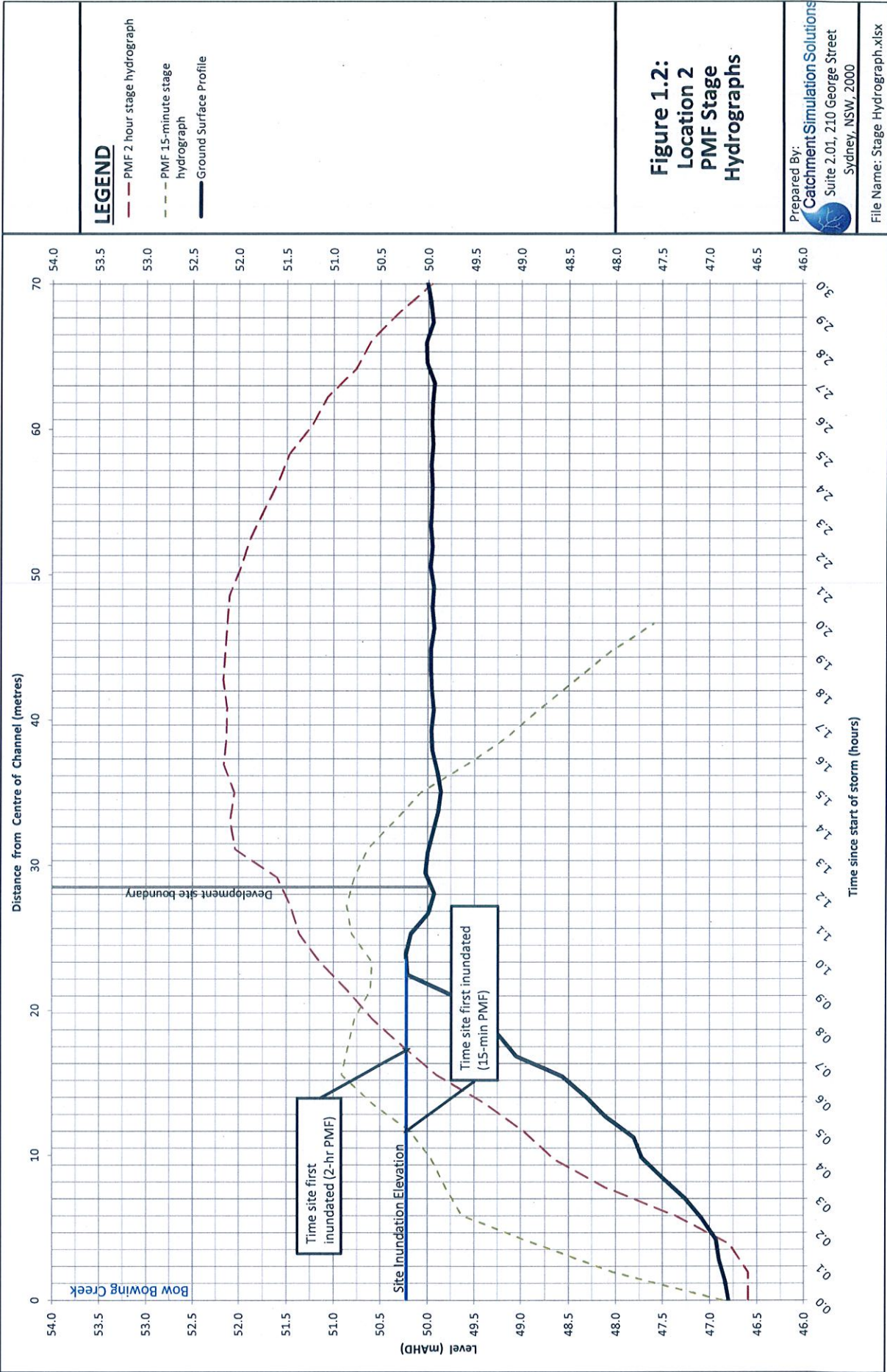


Scale 1:4,000 (at A3)  
0 100 200 m

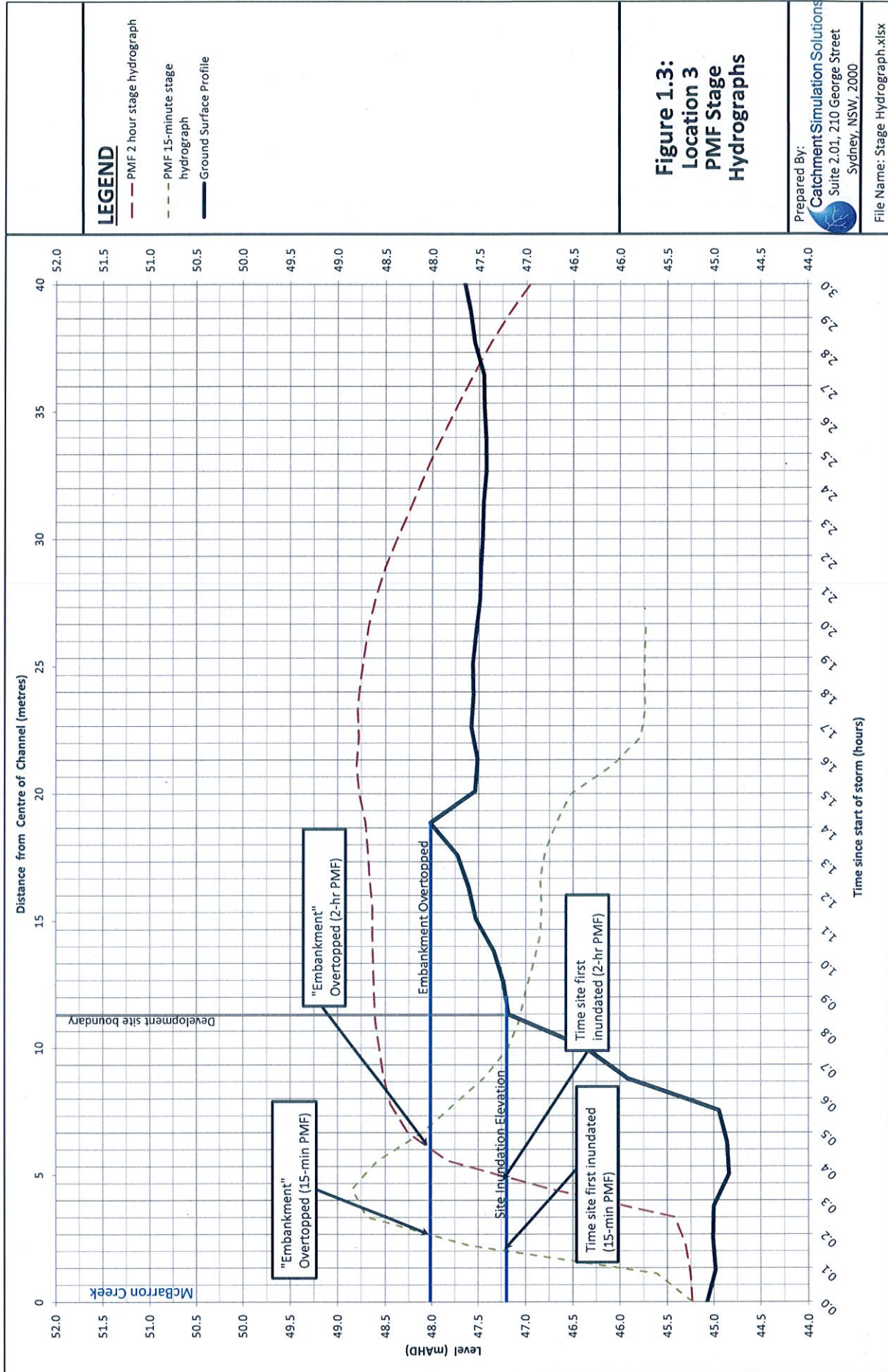
**Figure 1:  
Stage Hydrograph  
Locations**

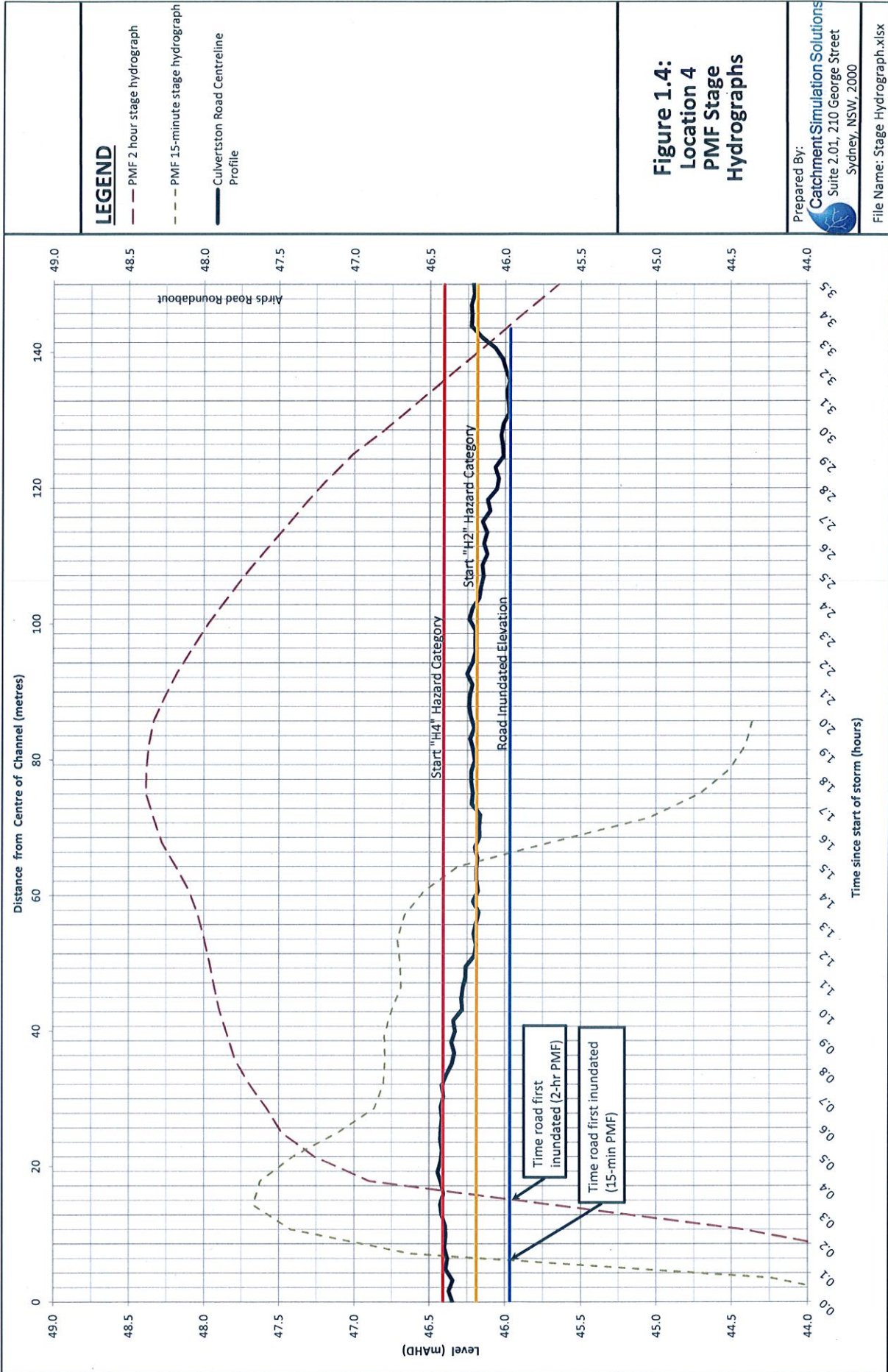




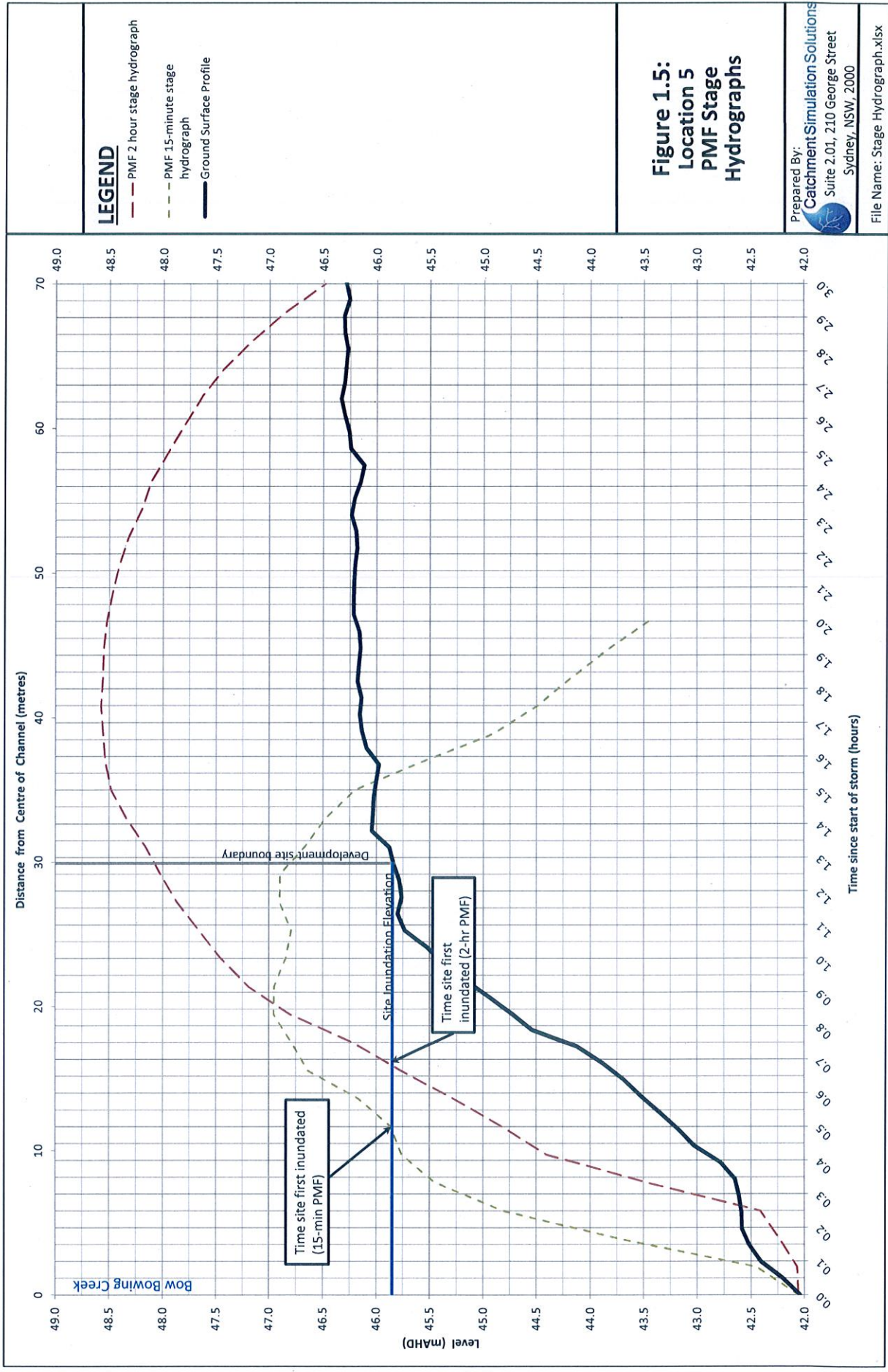














## **APPENDIX C**

### **Monthly Rainfall Data & Climate Statistics**

| Statistics                              | Jan  | Feb   | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Annual | Years | Plot         | Map |
|-----------------------------------------|------|-------|------|------|------|------|------|------|------|------|------|------|--------|-------|--------------|-----|
| Temperature                             |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| Mean maximum temperature (°C)           | 30.1 | 28.8  | 26.8 | 23.9 | 20.6 | 17.7 | 17.4 | 19.0 | 22.4 | 24.8 | 26.6 | 28.5 | 23.9   | 23    | 1997<br>2020 |     |
| Mean minimum temperature (°C)           | 18.0 | 17.8  | 16.1 | 12.9 | 9.0  | 7.2  | 5.8  | 6.4  | 9.3  | 11.8 | 14.4 | 16.2 | 12.1   | 23    | 1997<br>2020 |     |
| Rainfall                                |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| Mean rainfall (mm)                      | 73.7 | 119.2 | 84.8 | 69.5 | 42.7 | 72.6 | 39.5 | 38.2 | 37.1 | 61.1 | 76.1 | 63.6 | 748.4  | 22    | 1997<br>2020 |     |
| Decile 5 (median) rainfall (mm)         | 64.2 | 92.2  | 60.8 | 58.0 | 21.6 | 52.0 | 26.0 | 26.6 | 26.2 | 48.7 | 57.2 | 61.4 | 714.7  | 23    | 1997<br>2020 |     |
| Mean number of days of rain $\geq 1$ mm | 7.6  | 7.2   | 8.1  | 6.7  | 5.1  | 6.2  | 5.1  | 4.0  | 4.8  | 5.8  | 7.0  | 6.9  | 74.5   | 23    | 1997<br>2020 |     |
| Other daily elements                    |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| Mean daily sunshine (hours)             |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| Mean number of clear days               |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| Mean number of cloudy days              |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| 9 am conditions                         |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| Mean 9am temperature (°C)               | 22.0 | 21.5  | 19.4 | 17.5 | 13.8 | 11.1 | 10.3 | 12.0 | 15.6 | 18.1 | 19.2 | 20.9 | 16.8   | 13    | 1997<br>2010 |     |
| Mean 9am relative humidity (%)          | 73   | 77    | 81   | 76   | 77   | 80   | 78   | 70   | 65   | 61   | 70   | 71   | 73     | 13    | 1997<br>2010 |     |
| Mean 9am wind speed (km/h)              | 10.1 | 9.7   | 8.9  | 10.5 | 10.7 | 10.3 | 10.8 | 11.7 | 12.2 | 12.5 | 11.8 | 10.7 | 10.8   | 13    | 1997<br>2010 |     |
| 9am wind speed vs direction plot        |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| 3 pm conditions                         |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |
| Mean 3pm temperature (°C)               | 28.2 | 27.1  | 25.3 | 22.2 | 19.2 | 16.6 | 16.1 | 17.8 | 20.8 | 22.5 | 24.2 | 26.5 | 22.2   | 13    | 1997<br>2010 |     |
| Mean 3pm relative humidity (%)          | 49   | 53    | 54   | 53   | 52   | 55   | 50   | 42   | 42   | 45   | 50   | 48   | 49     | 13    | 1997<br>2010 |     |
| Mean 3pm wind speed (km/h)              | 19.4 | 17.0  | 14.8 | 14.4 | 13.0 | 12.9 | 13.9 | 16.1 | 18.1 | 19.8 | 19.5 | 19.9 | 16.6   | 13    | 1997<br>2010 |     |
| 3pm wind speed vs direction plot        |      |       |      |      |      |      |      |      |      |      |      |      |        |       |              |     |

## HORSLEY PARK EQUESTRIAN CENTRE AWS

### Mean rainfall (mm)

#### Site details

Site name: HORSLEY PARK EQUESTRIAN CENTRE A  
Latitude: 33.85 °S

Longitude: 150.86 °E

Site number: 067119  
Elevation: 100 m

Commenced: 1997  
Operational status: Still Open

#### Yearly data

#### 30 year statistics

#### Comparison site

#### First statistic

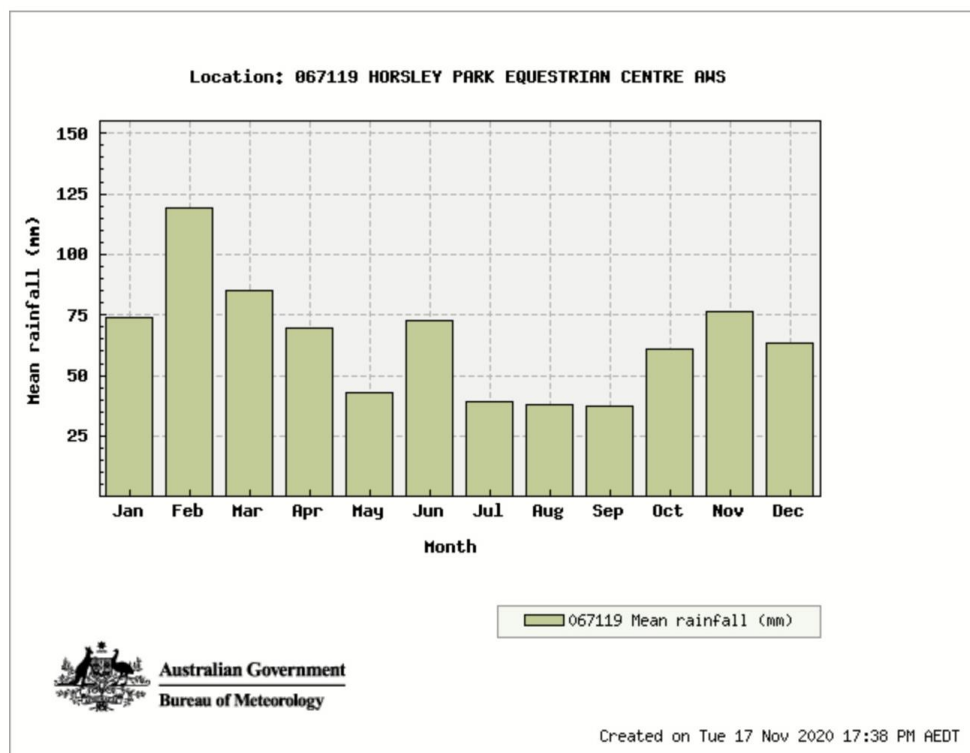
#### Second statistic

Note: Only one option can be redrawn at a time

Include data for the year:

2020

Redraw



#### Statistics

|                                           | Jan  | Feb   | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Annual | Years |
|-------------------------------------------|------|-------|------|------|------|------|------|------|------|------|------|------|--------|-------|
| Mean rainfall (mm) for years 1997 to 2020 | 73.7 | 119.2 | 84.8 | 69.5 | 42.7 | 72.6 | 39.5 | 38.2 | 37.1 | 61.1 | 76.1 | 63.6 | 778.1  | 23    |

12.3 = Not quality controlled

Page created: Tue 17 Nov 2020 17:38:15 PM AEDT

**APPENDIX D**  
**Campbelltown City Local SES Flood Plan**  
**June 2015**

June 2015

To be reviewed no later than June 2020

---

# **CAMPBELLTOWN CITY FLOOD EMERGENCY SUB PLAN**

---

**A Sub-Plan of the Campbelltown Local Emergency Management Plan (EMPLAN)**

**Volume 1 of the Campbelltown City Local Flood Plan**

## AUTHORISATION

The Campbelltown City Flood Emergency Sub Plan is a sub plan of the Campbelltown Local Emergency Management Plan (EMPLAN). It has been prepared in accordance with the provisions of the **State Emergency Service Act 1989 (NSW)** and is authorised by the Local Emergency Management Committee in accordance with the provisions of the **State Emergency and Rescue Management Act 1989 (NSW)**.

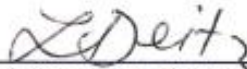
Recommended



NSW SES Campbelltown City Local Controller

Date: 24th MARCH 2015.

Approved



Chair, Local Emergency Management Committee

Date: 24 JUNE 2015



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## DISTRIBUTION LIST

| Recipient                                                                              | Number of Copies |
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| NSW SES Campbelltown City Local Controller                                             | 1                |
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| NSW SES State Headquarters                                                             | 1                |
| Campbelltown, Local Emergency Operations Controller                                    | 1                |
| NSW Police Force, Campbelltown and Macquarie Fields Local Area Commands                | 1 each           |
| Campbelltown, Local Emergency Management Committee Members                             | 4                |
| Campbelltown, Local Emergency Management Officer                                       | 1                |
| Campbelltown, Local Emergency Operations Centre                                        | 1                |
| Campbelltown City Council, Mayor                                                       | 1                |
| Campbelltown City Council, General Manager                                             | 1                |
| Campbelltown City Council, Emergency Management and Facilities Services Department     | 1                |
| Campbelltown City Council, Technical Services Department                               | 1                |
| Fire and Rescue NSW, Campbelltown, Ingleburn, Macquarie Fields, Rosemeadow, St Andrews | 1 each           |
| NSW Rural Fire Service, Macarthur                                                      | 1                |
| Ambulance Service of NSW, Campbelltown and Macquarie Fields                            | 1 each           |
| Office of Environment and Heritage                                                     | 1                |
| Evacuation Centres                                                                     | 1 each           |
| Hospitals                                                                              | 1 each           |
| Schools                                                                                | 1 each           |
| Council Libraries                                                                      | 1 each           |
| <b>Total</b>                                                                           |                  |

## VERSION HISTORY

The following table lists all previously endorsed versions of this plan.

| Description | Date |
|-------------|------|
|             |      |
|             |      |
|             |      |
|             |      |
|             |      |

## AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

The Campbelltown City Local Controller  
 NSW State Emergency Service  
 Cnr Alderney & Townson Avenue, MINTO, NSW 2566

Amendments promulgated in the amendments list below have been entered in this plan.

| Amendment Number | Description | Updated by | Date |
|------------------|-------------|------------|------|
|                  |             |            |      |
|                  |             |            |      |
|                  |             |            |      |
|                  |             |            |      |
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|                  |             |            |      |
|                  |             |            |      |

*Document Issue: V1-30122014*

## LIST OF ABBREVIATIONS

The following abbreviations have been used in this plan:

|               |                                                       |
|---------------|-------------------------------------------------------|
| <b>AEP</b>    | Annual Exceedance Probability                         |
| <b>AHD</b>    | Australian Height Datum                               |
| <b>AIIMS</b>  | Australasian Inter-service Incident Management System |
| <b>ARI</b>    | Average Recurrence Interval (Years)                   |
| <b>ALERT</b>  | Automated Local Evaluation in Real Time               |
| <b>AWRC</b>   | Australian Water Resources Council                    |
| <b>BUREAU</b> | Australian Government Bureau of Meteorology           |
| <b>CBRN</b>   | Chemical, Biological, Radiological or Nuclear         |
| <b>DCF</b>    | Dam Crest Flood                                       |
| <b>DSC</b>    | Dams Safety Committee                                 |
| <b>DSEP</b>   | Dam Safety Emergency Plan                             |
| <b>DVR</b>    | Disaster Victim Registration                          |
| <b>EMPLAN</b> | Emergency Management Plan                             |
| <b>FRNSW</b>  | Fire and Rescue New South Wales (NSW)                 |
| <b>GIS</b>    | Geographic Information System                         |
| <b>GRN</b>    | Government Radio Network                              |
| <b>IAP</b>    | Incident Action Plan                                  |
| <b>IFF</b>    | Imminent Failure Flood                                |
| <b>LEMC</b>   | Local Emergency Management Committee                  |
| <b>LEOCON</b> | Local Emergency Operations Controller                 |
| <b>LO</b>     | Liaison Officer                                       |
| <b>LGA</b>    | Local Government Area                                 |
| <b>MHL</b>    | Manly Hydraulics Laboratory                           |
| <b>NOW</b>    | NSW Office of Water                                   |

|                |                                                       |
|----------------|-------------------------------------------------------|
| <b>NSW RFS</b> | NSW Rural Fire Service                                |
| <b>NSW SES</b> | NSW State Emergency Service                           |
| <b>NSW VRA</b> | NSW Volunteer Rescue Association                      |
| <b>OEH</b>     | Office of Environment and Heritage (previously DECCW) |
| <b>PMF</b>     | Probable Maximum Flood                                |
| <b>PMR</b>     | Private Mobile Radio                                  |
| <b>PMP</b>     | Probable Maximum Precipitation                        |
| <b>PIIC</b>    | Public Information and Inquiry Centre                 |
| <b>REMC</b>    | Region Emergency Management Committee                 |
| <b>REMO</b>    | Regional Emergency Management Officer                 |
| <b>RMS</b>     | Roads and Maritime Services                           |
| <b>SEOCON</b>  | State Emergency Operations Controller                 |
| <b>SERCON</b>  | State Emergency Recovery Controller                   |
| <b>SEWS</b>    | Standard Emergency Warning Signal                     |
| <b>SITREPs</b> | Situation Reports                                     |
| <b>WICEN</b>   | Wireless Institute Civil Emergency Network            |



## GLOSSARY

**Annual Exceedance Probability (AEP).** The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. For example, if a peak flood level (height) has an AEP of 5%, there is a 5% chance (that is, a one-in-20 chance) of such a level or higher occurring in any one year (see also Average Recurrence Interval).

**Assistance Animal.** A guide dog, a hearing assistance dog or any other animal trained to assist a person to alleviate the effect of a disability (Refer to Section 9 of the Disability Discrimination Act 1992).

**Assembly Area.** An assembly area is a designated location used for the assembly of emergency-affected persons before they move to temporary accommodation or a nominated evacuation centre. As such these areas do not provide welfare assistance nor are they used for long term sheltering or provision of meals. An assembly area may also be a prearranged, strategically placed area, where support response personnel, vehicles and other equipment can be held in readiness for use during an emergency.

**Australian Height Datum (AHD).** A common national surface level datum approximately corresponding to mean sea level.

**Average Recurrence Interval (ARI).** The long-term **average** number of years between the occurrence of a flood as big as, or larger than, the selected event. For example, floods reaching a height as great as, or greater than, the 20 year ARI flood event will occur **on average** once every 20 years.

**Catchment (River Basin).** The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location.

**Coastal Erosion.** The loss of land along the shoreline predominantly by the offshore movement of sand during storms.

**Coastal Flooding.** Flooding due to tidal or storm-driven coastal events, including storm surges in lower coastal waterways. This can be exacerbated by wind-wave generation from storm events (1).

**Dambreak Study.** A Dambreak Study is undertaken to determine the likely downstream inundation areas in case of a dam failure. Modelling is undertaken for a range of dam breach possibilities and design floods. The dambreak study includes information such as the extent of flooding, flood travel times and flood water velocities. The study can assist dam owners, regulators, and emergency agencies in

the preparations of evacuation plans, dam break and other flood warning systems, and hazard classification of affected areas.

**Dam Failure.** The uncontrolled release of a water storage. The failure may consist of the collapse of the dam or some part of it, or excessive seepage or discharges. The most likely causes of dam failure are;

- **Flood Induced Dam Failure:** Dam failure caused by flood, either due to overtopping erosion or by subsequent structural failure.
- **Sunny Day Dam Failure:** Dam Failure as a result of factors other than flood i.e. other than flood flow into the reservoir. Causes of "Sunny Day" dam failure can include internal erosion, landslide, piping, earthquake or sabotage.

**Dam Safety Emergency Plan (DSEP).** A DSEP outlines the required actions of owners and their personnel at dams in response to a range of possible emergency situations. The NSW Dam Safety Committee requires a quality controlled DSEP, with associated dambreak warning procedures to be prepared for prescribed dams where persons may be at risk downstream, if the dam failed.

**Design Flood (or Flood Standard).** A flood of specified magnitude that is adopted for planning purposes. Selections should be based on an understanding of flood behaviour and the associated flood risk, and take account of social, economic and environmental considerations. There may be several design floods for an individual area.

**Emergency Alert.** The national telephone warning system used by emergency services to send voice messages to landlines and text messages to mobile phones within a defined area, about likely or actual emergencies.

**EMPLAN (Emergency Management Plan).** The object of an EMPLAN is to ensure the coordinated response by all agencies having responsibilities and functions in emergencies.

**Essential Services.** Those services, often provided by local government authorities, that are considered essential to the life of organised communities. Such services include power, lighting, water, gas, sewerage and sanitation clearance.

**Evacuation.** The temporary movement of people from a dangerous or potentially dangerous place to a safe location, and their eventual return. It is a safety strategy which uses distance to separate people from the danger created by the hazard.

**Evacuation Order.** Notification to the community, authorised by the NSW SES, when the intent of an Incident Controller is to instruct a community to immediately evacuate in response to an imminent threat.

**Evacuation Warning.** Notification to the community, authorised by the NSW SES, when the intent of an Incident Controller is to warn a community of the need to prepare for a possible evacuation.

**Flash Flooding.** Flooding which is sudden and often unexpected because it is caused by sudden local or nearby heavy rainfall. It is sometimes defined as flooding which occurs within six hours of the rain that causes it.

**Flood.** Relatively high water level which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences, including Tsunami.

**Flood Classifications.** Locally defined flood levels used in flood warnings to give an indication of the severity of flooding (minor, moderate or major) expected. These levels are used by the State Emergency Service and the Australian Government Bureau of Meteorology in flood bulletins and flood warnings.

**Flood Intelligence.** The product of collecting, collating, analysing and interpreting flood-related data to produce meaningful information (intelligence) to allow for the timely preparation, planning and warning for and response to a flood.

**Flood Fringe.** The remaining area of flood prone land after floodway and flood storage have been defined.

**Flood Liable Land (also referred to as Flood Prone Land).** Land susceptible to flooding by the Probable Maximum Flood (PMF) event. This term also describes the maximum extent of a **floodplain** which is an area of a river valley, adjacent to the river channel, which is subject to inundation in floods up to this event.

**Flood of Record.** Maximum observed historical flood.

**Floodplain.** Area of land which is subject to inundation by floods up to and including the probable maximum flood event, that is, flood prone land (2).

**Floodplain Management Plan.** A plan developed in accordance with the principles and guidelines in the New South Wales Floodplain Development Manual. Such a plan usually includes both written and diagrammatic information describing how particular areas of flood prone land can be used and managed to achieve defined objectives.

**Flood Plan.** A response strategy plan that deals specifically with flooding and is a sub-plan of an Emergency Management Plan. Flood plans describe agreed roles, responsibilities, functions, strategies and management arrangements for the

conduct of flood operations and for preparing for them. A flood plan contains information and arrangements for all floods whereas an IAP is for a specific flood/event.

**Flood Rescue.** The rescue or retrieval of persons trapped by floodwaters.

**Flood Storage Areas.** Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. The extent and behaviour of flood storage areas may change with flood severity, and loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation.

**Floodway.** An area where a significant volume of water flows during floods. Such areas are often aligned with obvious naturally-defined channels and are areas that, if partially blocked, would cause a significant redistribution of flood flow which may in turn adversely affect other areas. They are often, but not necessarily, the areas of deeper flow or the areas where higher velocities occur.

**Flood Watch.** A Flood Watch is a notification of the potential for a flood to occur as a result of a developing weather situation and consists of short generalised statements about the developing weather including forecast rainfall totals, description of catchment conditions and indicates streams at risk. The Bureau will also attempt to estimate the magnitude of likely flooding in terms of the adopted flood classifications. Flood Watches are normally issued 24 to 36 hours in advance of likely flooding. Flood watches are issued on a catchment wide basis.

**Flood Warning.** A Flood Warning is a gauge specific forecast of actual or imminent flooding. Flood Warnings specify the river valley, the locations expected to be flooded, the likely severity of flooding and when it will occur.

**Functional Area.** A category of services involved in the preparations for an emergency, including the following:

- Agriculture and Animal Services;
- Energy and Utility Services;
- Engineering Services;
- Environmental Services;
- Health Services;
- Public Information Services;
- Telecommunication Services;
- Transport Services; and
- Welfare Services.

**Geographic Information System (GIS).** A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analysing, and displaying all forms of geographically referenced information.

**Incident Action Plan (IAP).** An action plan for managing a specific event. Information from the Local Flood Plan is used to develop the flood IAP.

**Indirect Effect.** Indirect effects are generally a consequence of infrastructure damage or interruption of services and can affect communities distant from the actual flood footprint i.e. floodplain. Indirect effects can also refer to indirect losses due to disruption of economic activity, both in areas which are inundated or isolated. Indirect effects are one of the three primary sources of risk in the context of flooding (the other two are inundation and isolation).

**Inundation.** See definition for Flood.

**Isolation.** Properties and/or communities where flooding cuts access to essential services or means of supply. Isolation is one of the three primary sources of risk in the context of flooding (the other two are inundation and indirect effects).

**Liaison Officer (LO).** A person, nominated or appointed by an organisation or functional area, to represent that organisation or functional area at a control centre, emergency operations centre, or coordination centre. A liaison officer maintains communications with and conveys directions/requests to their organisation or functional area, and provides advice on the status, capabilities, actions and requirements of their organisation or functional area (3).

**Local Emergency Management Committee (LEMC).** The LEMC is responsible for the preparation of plans in relation to the prevention of, preparation for, response to and recovery from emergencies in the local government area for which it is constituted. In the exercise of its functions, the Committee is responsible to the Region Emergency Management Committee (REMC) and may communicate with the REMC for matters associated with Functional Areas that are not represented at the local Level.

**Local Overland Flooding.** Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.

**Major Flooding.** Flooding which causes inundation of extensive rural areas, with properties, villages and towns isolated and/or appreciable urban areas flooded.

**Minor Flooding.** Flooding which causes inconvenience such as closing of minor roads and the submergence of low-level bridges. The lower limit of this class of flooding, on the reference gauge, is the initial flood level at which landholders and/or townspeople begin to be affected in a significant manner that necessitates the

issuing of a public flood warning by the Australian Government Bureau of Meteorology.

**Moderate Flooding.** Flooding which inundates low-lying areas, requiring removal of stock and/or evacuation of some houses. Main traffic routes may be covered.

**Moveable Dwellings.** Any tent, or any caravan or other van or other portable device (whether on wheels or not), used for human habitation; or a manufactured home; or any conveyance, structure or thing of a class or description prescribed by the (Local Government) regulations (4).

**Peak Height.** The highest level reached, at a nominated gauging station, during a particular flood event.

**Prescribed Dam.** "Prescribed" dams are those listed in Schedule 1 of the Dams Safety Act 1978. The NSW Dam Safety Committee will prescribe those dams with the potential for a failure which could have a significant adverse effect on community interests.

**Probable Maximum Flood (PMF).** The largest flood that could conceivably be expected to occur at a particular location, usually estimated from probable maximum precipitation. The PMF defines the maximum extent of flood prone land, that is, the floodplain. It is difficult to define a meaningful Annual Exceedance Probability for the PMF, but it is commonly assumed to be of the order of  $10^4$  to  $10^7$  (once in 10,000 to 10,000,000 years).

**Rescue.** The safe removal of persons or domestic animals from actual or threatened danger of physical harm.

**Riverine Flooding.** Inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam. Riverine flooding generally excludes watercourses constructed with pipes or artificial channels considered as stormwater channels (1).

**Runoff.** The amount of rainfall which ends up as stream flow, also known as 'rainfall excess' since it is the amount remaining after accounting for other processes such as evaporation and infiltration.

**Stage Height.** A level reached, at a nominated gauging station, during the development of a particular flood event.

**Stream Gauging Station.** A place on a river or stream at which the stage height is routinely measured, either daily or continuously, and where the discharge is measured from time to time so as to develop a relationship between stage and discharge or rating curve.



**Total Flood Warning System.** A flood warning system is made up of components which must be integrated if the system is to operate effectively. Components of the total flood warning system include monitoring rainfall and river flows, prediction, interpretation of the likely impacts, construction and dissemination of warning messages, response by agencies and community members, and review of the warning system after flood events (5).

## PART 1 - INTRODUCTION

### 1.1 PURPOSE

- 1.1.1 This plan covers preparedness measures, the conduct of response operations and the coordination of immediate recovery measures from flooding within the Campbelltown LGA. It covers operations for all levels of flooding within the council area.

### 1.2 AUTHORITY

- 1.2.1 This plan is issued under the authority of the *State Emergency and Rescue Management Act 1989* (NSW) and the *State Emergency Service Act 1989* (NSW). It has been approved by the NSW SES Campbelltown City Local Controller and the NSW SES Sydney Southern Region Controller as a NSW SES plan and endorsed by the Campbelltown Local Emergency Management Committee as a sub plan of the Local EMPLAN.

### 1.3 AREA COVERED BY THE PLAN

- 1.3.1 The area covered by the plan is the Campbelltown LGA which includes: Georges River, Nepean River, Woronora River, O'Hares Creek, Punchbowl Creek, Gunyah Creek, Williams Creek, Smith Creek, Bow Bowling Creek, and Bunbury Curran Creek.
- 1.3.2 The council area and its principal rivers and creeks are shown in Attachment 3.
- 1.3.3 The council area is in the NSW SES Sydney Southern Region and for emergency management purposes is part of the South West Metropolitan Emergency Management Region.

### 1.4 DESCRIPTION OF FLOODING AND ITS EFFECTS

- 1.4.1 The NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Campbelltown LGA.

### 1.5 RESPONSIBILITIES

- 1.5.1 The general responsibilities of emergency service organisations and supporting services (functional areas) are listed in the Local and State Emergency Management Plans (EMPLAN). Some specific responsibilities are expanded upon in the following paragraphs. The extent of their implementation will depend on the severity of the flooding.
- 1.5.2 **NSW SES Campbelltown City Local Controller.** The NSW SES Campbelltown City Local Controller is responsible for dealing with floods as detailed in the State Flood Plan, and will;

### Preparedness

- a. Maintain a Local Headquarters at Cnr Alderney and Townson Street Minto in accordance with the NSW SES Controllers' Guide and the NSW SES Operations Manual.
- b. Ensure that NSW SES members are trained to undertake operations in accordance with current policy as laid down in the NSW SES Controllers' Guide and the NSW SES Operations Manual.
- c. Coordinate the development and operation of a flood warning service for the community.
- d. Participate in floodplain risk management initiatives organised by the Campbelltown City Council.
- e. Coordinate a community engagement and capacity building program regarding local flood issues and associated risks to assist communities in building resilience to floods.
- f. Identify and monitor people and/or communities at risk of flooding.
- g. Ensure that the currency of this plan is maintained.

### Response

- h. Appoint an appropriate Incident Controller to undertake response roles. The Incident Controller will;
  - Control flood and storm response operations. This includes;
    - Directing the activities of the NSW SES units operating within the council area.
    - Coordinating the activities of supporting agencies and organisations and ensuring that liaison is established with them.
    - Contribute to preparation of Region IAP.
  - Coordinate the provision of an information service in relation to;
    - Flood heights and flood behaviour.
    - Road conditions and closures.
    - Advice on methods of limiting property damage.
    - Confirmation of evacuation warnings and evacuation orders.
  - Direct the conduct of flood rescue operations.
  - Direct the evacuation of people and/or communities.
  - Coordinate the provision of immediate welfare support for evacuated people.
  - Coordinate the provision of emergency food and medical supplies to isolated people and/or communities.

- Coordinate operations to assist the community to protect property. This may include;
  - Arranging resources for sandbagging operations.
  - Lifting or moving household furniture.
  - Lifting or moving commercial stock and equipment.
- Where possible, arrange for support (for example, accommodation and meals) for emergency service organisation members and volunteers assisting them.
- Ensure that the managers of caravan parks are advised of flood warnings and the details of any evacuation order.
- If NSW SES resources are available, assist with emergency fodder supply operations conducted by Agriculture and Animal Services.
- If NSW SES resources are available, assist the NSW Police Force, RMS and Council with road closure and traffic control operations.
- Exercise financial delegations relating to the use of emergency orders as laid down in the NSW SES Controllers' Guide.
- Coordinate the collection of flood information for development of intelligence.
- Submit Situation Reports to the NSW SES Sydney Southern Region Headquarters and agencies assisting within the council area. These will contain information on;
  - Road conditions and closures.
  - Current flood behaviour.
  - Current operational activities.
  - Likely future flood behaviour.
  - Likely future operational activities.
  - Probable resource needs.
- Keep the Local Emergency Operations Controller advised of the flood situation and the operational response.
- Issue the 'All Clear' when flood operations have been completed.

### Recovery

- i. Ensure that appropriate After Action Reviews are held after floods.
- j. Provide appropriate representation to the recovery committee for the duration of the response phase of an event and as agreed during the recovery phase.

#### 1.5.3 NSW SES Campbelltown City Unit Members

- a. Assist with preparedness activities.
- b. Undertake training in flood and storm response operations.

- c. Carry out flood response tasks. These may include;
  - The management of the NSW SES Campbelltown City Local and Unit Headquarters Operations Centres.
  - Assist in the collection of flood information for the development of intelligence.
  - Flood rescue.
  - Evacuation.
  - Providing immediate welfare for evacuated people.
  - Delivery of warnings and information.
  - Resupply.
  - Sandbagging.
  - Lifting and/or moving household furniture and commercial stock.
  - Animal rescue.
  - Assisting with road closure and traffic control operations.
- d. Assisting with emergency fodder supply operations.

#### 1.5.4 **Campbelltown Local Emergency Operations Controller (LEOCON)**

- a. Monitor flood operations.
- b. Request and coordinate support to the NSW SES Campbelltown City Local Controller if requested to do so.

#### 1.5.5 **Campbelltown Local Emergency Management Officer**

- a. Provide executive support to the LEMC and LEOCON in accordance with the Campbelltown Local Emergency Management Plan.
- b. At the request of the NSW SES Campbelltown City Local Controller, advise appropriate agencies and officers of the start of response operations.

#### 1.5.6 **Campbelltown City Council**

##### **Preparedness**

- a. Develop and implement floodplain risk management plans in accordance with the NSW Government's Flood Prone Land Policy and the Floodplain Development Manual.
- b. Establish and maintain floodplain risk management committees and ensure that key stakeholders are represented on such committees.
- c. Provide levee studies, flood studies and floodplain management studies to the NSW SES.
- d. Maintain Dam Safety Emergency Plans for the Campbelltown Link Area Basin 1, Campbelltown North Detention Basin, Smiths Creek Retention Basin 1, Smiths Creek Retention Basin 2, and Smiths Creek Retention Basin 3 dams and provide copies to the NSW SES.

- e. Provide information on the consequences of dam failure to the NSW SES for incorporation into planning and flood intelligence.
- f. Maintain a plant and equipment resource list for the council area.
- g. Work with NSW SES on the development and implementation of a community engagement and capacity building program.
- h. Coordinate the development of warning services for catchments prone to flash flooding (small catchments), where appropriate.
- i. Maintain and operate council-owned flood warning systems.

#### Response

- j. At the request of the NSW SES Incident Controller, deploy personnel and resources for flood related activities.
- k. Close and reopen council roads (and other roads nominated by agreement with the RMS) and advise the NSW SES Incident Controller and the Police.
- l. Provide information on the status of roads.
- m. Provide filled sandbags to urban and village areas in which flooding is expected.
- n. Assist with the removal of caravans from caravan parks.
- o. Provide back-up radio communications.
- p. In the event of evacuations, assist with making facilities available for the domestic pets and companion animals of evacuees.

#### Recovery

- q. Provide for the management of health hazards associated with flooding. This includes removing debris and waste.
- r. Ensure premises are fit and safe for reoccupation and assess any need for demolition.
- s. Arrange for storage of evacuees' furniture as required.

#### 1.5.7 Agriculture and Animal Services Functional Area

- a. Activate the Agriculture and Animal Services Supporting Plan as required and coordinate the provision of required services which may include;
  - Coordinate response for animal welfare including pets, livestock and wildlife;
  - Supply and delivery of emergency fodder;
  - Emergency water replacement in certain circumstances;
  - Identify at risk animals and agriculture and support warning and preparedness measures;



- Coordinate the assessment, care, humane destruction and disposal of affected animals;
- Financial, welfare and damage assessment assistance to flood affected farmers;
- Coordinate support to primary producers, animal holding establishments, evacuees and the community in emergencies, including rescue, evacuation and emergency care of animals; and
- Support recovery arrangements including:
  - Provide impact assessments;
  - Contribute to recovery centres and recovery committees;
  - Deliver recovery information including workshops; and
  - Administer transport subsidies to primary producers.

#### 1.5.8 The **New South Wales Ambulance**

- a. Assist with the evacuation of at risk communities (in particular elderly and/or infirm people).
- b. Deploy ambulance resources to appropriate locations if access is expected to be lost.
- c. Assist the NSW SES with flood rescue operations.

#### 1.5.9 **Australian Government Bureau of Meteorology (The Bureau)**

- a. Provide Flood Watches for the Georges River and Hawkesbury-Nepean River Basins.
- b. Provide Flood Warnings, incorporating height-time predictions, for Menangle gauge.
- c. Provide severe weather warnings when flash flooding is likely to occur.

#### 1.5.10 **Caravan Park Proprietor(s)**

- a. Prepare a flood emergency plan for the Caravan Park.
- b. Ensure that owners and occupiers moveable dwellings are aware that the caravan park is flood liable by;
  - Providing a written notice to occupiers taking up residence. The notice will indicate that the caravan park is liable to flooding and designate the location of flood liable land within the park.
  - Displaying this notice and the emergency arrangements for the Caravan Park prominently in the park.
- c. Ensure that owners and occupiers of moveable dwellings are aware that if they are expecting to be absent for extended periods, they should:
  - Provide the manager of the caravan park with a contact address and telephone number in case of an emergency.

- Leave any moveable dwelling in a condition allowing it to be relocated in an emergency (i.e. should ensure that the wheels, axles and draw bar of the caravans are not removed, and are maintained in proper working order) (6).
- d. Ensure that occupiers are informed of Flood Information. At this time, occupiers should be advised to;
  - Ensure that they have spare batteries for their radios.
  - Listen to a local radio station for updated flood information.
  - Prepare for evacuation and moveable dwelling relocation.
- e. Ensure that owners and occupiers of caravans are aware of what they must do to facilitate evacuation and moveable dwelling relocation when flooding occurs.
- f. Coordinate the evacuation of people and the relocation of moveable dwellings when floods are rising and their return when flood waters have subsided. Moveable dwellings will be relocated back to the caravan park(s) by owners or by vehicles and drivers arranged by the park managers.
- g. Secure any moveable dwellings that are not able to be relocated to prevent floatation.
- h. Inform the NSW SES of the progress of evacuation and/or moveable dwellings relocation operations and of any need for assistance in the conduct of these tasks.

#### 1.5.11 **Child Care Centres and Preschools**

- a. Childcare Centres are to be contacted by the NSW SES in the event of possible flooding or isolation.
- b. When notified the child care centres and preschools should;
  - Liaise with the NSW SES and arrange for the early release of children whose travel arrangements are likely to be disrupted by flooding and/or road closures.
  - Assist with coordinating the evacuation of preschools and child care centres.

#### 1.5.12 **Energy and Utility Services Functional Area**

- a. When requested by NSW SES;
  - Implement the Energy and Utilities Services Functional Area Supporting Plan.
  - Where required, coordinate energy and utility services emergency management planning, preparation, response and recovery, including the restoration of services following a flood event.

- Coordinate advice to the NSW SES of any need to disconnect electricity, gas, water or wastewater services.
  - Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.
  - Identify interdependencies between flooding and utility services due to secondary impacts of flooding and advise the NSW SES.
  - Assist the NSW SES with advisory notices relating to hazards from utility services during flooding.
  - Coordinate with utilities on restoration of services, including advisory notices relating to estimated time for restoration and mandatory safety checks prior to reconnection. Advise the NSW SES and the relevant recovery committee and coordinator of the timetable for restoration.
- b. Local utility service distribution providers (electricity, gas, water, waste water):
- Provide advice to the NSW SES Campbelltown City Local Controller of any need to disconnect power/gas/water/waste water supplies or of any timetable for reconnection.
  - Advise the NSW SES of any hazards from utility services during flooding.
  - Advise the public with regard to electrical hazards during flooding and to the availability or otherwise of the electricity supply.
  - Clear or make safe any hazard caused by power lines or electricity distribution equipment.
  - Reconnect customers' electrical/ gas/ water/waste water installations, when certified safe to do so and as conditions allow.
  - Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

#### 1.5.13 Engineering Services Functional Area

- a. When requested by NSW SES;
- Provide engineering advice regarding the integrity of damaged structures.
  - Assist the NSW SES with damage assessment.
  - Acquire and/or provide specialist technical engineering expertise.
  - Assist the NSW SES and councils with the assessment and operation of flood protection levees when requested.
  - Assist with property protection, including the construction or repair of levees.
  - Coordinate the restoration of critical public facilities.

- b. When requested by the Recovery Coordinator:
  - Establish Recovery Centres by the procurement and fit-out of suitable properties.

#### 1.5.14 **Environmental Services Functional Area**

- a. When requested by NSW SES;
  - Implement the Environmental Services Functional Area (Enviroplan) Supporting Plan if required.

#### 1.5.15 **Fire and Rescue NSW, Campbelltown, Ingleburn, Macquarie Fields, Rosemeadow, and St Andrews**

- a. FRNSW responsibilities are primarily confined to the FRNSW Fire District. Any deployment of FRNSW resources to assist NSW SES in flood events rests with the respective FRNSW Commander which must be a Senior Officer.
- b. The FRNSW Commander will assess the capability of FRNSW to assist NSW SES in the following tasks:
  - Warning and/or evacuation of at risk communities.
  - Monitoring / reconnaissance of flood prone areas.
  - Resupply of isolated communities and/or properties.
  - Property protection tasks including sandbagging.
  - Provide resources for pumping flood water out of buildings and from low-lying areas.
  - Clean-up operations, including the hosing out of flood affected properties.
  - Coordinate the deployment of fire resources to communities within Fire and Rescue NSW fire districts if access is expected to be lost in consultation with the NSW SES.
- c. FRNSW will use its best endeavours to deploy appliances and or resources into locations where access is expected to be lost.

#### 1.5.16 **Forestry Corporation of NSW**

- a. Close and evacuate at risk camping grounds in State Forest managed areas.
- b. Close and reopen Forestry Corporation of NSW roads when affected by flood waters and advise the NSW SES of its status.
- c. Facilitate the safe reliable access of emergency resources on Forestry Corporation managed roads.
- d. Assist the NSW SES with identification of road infrastructure at risk of flooding.
- e. Manage traffic in Forestry Corporation of NSW roads.

- f. Assist the NSW SES with the communication of warnings and information provision to the public through variable message signs and other appropriate means.

#### 1.5.17 Health Services Functional Area

- a. When requested by NSW SES;
  - Activate Healthplan if required.
  - Ensure that appropriate business continuity plans are developed for essential health infrastructure and are activated during floods.
  - Provide medical support to the NSW SES.
  - Establish health surveillance in affected areas.
  - Assess potential public health risks that either acutely endanger the health of human populations or are thought to have longer term consequences.
  - Provide environmental health advice.
  - Provide public health warnings and advice to affected communities.
  - Provide psychological counselling support to the community and emergency response workers impacted, via NSW Health Mental Health Division.
  - Assist the NSW SES with the warning and evacuation of public hospitals, private hospitals and residential aged care facilities.
  - Undertake vulnerable persons assessment for mental health and drug and alcohol dependant persons, dialysis, frail and/or aged and oxygen dependant persons in the community, known to the health service.

#### 1.5.18 NSW Office of Water

- a. Collect and maintain flood data including data relating to flood heights, velocities and discharges.
- b. Provide the Bureau of Meteorology and NSW SES real-time or near real-time access to river height gauges and height data for the development of official flood warnings.
- c. Provide flow rating charts for river height gauges.
- d. Manage (with technical support from OEH) the approval process under the Water Act 1912 and Water Management Act 2000 for flood control works (earthworks, embankments and levees which can affect the distribution of floodwaters) including;
  - Assessment and approval of flood control works (including flood mitigation works) in rural areas designated under the Acts.
  - Use of floodplain management plans prepared by OEH in rural areas designated under the Acts to assess flood control work approvals.

- Giving the NSW SES access to relevant studies regarding flooding and studies supporting floodplain management plans prepared by OEH including flood studies, floodplain risk management studies and flood behaviour investigations.

**1.5.19 NSW Police Force, Campbelltown and Macquarie Fields Local Area Commands (LAC)**

- Assist the NSW SES with the delivery of evacuation warnings and evacuation orders.
- Assist the NSW SES with the conduct of evacuation operations.
- Conduct road and traffic control operations in conjunction with council and/or RMS.
- Coordinate the registration of evacuees.
- Secure evacuated areas.

**1.5.20 NSW Rural Fire Service (RFS Macarthur)**

- Provide personnel in rural areas and villages to;
  - Inform the NSW SES Campbelltown City Local Controller about flood conditions and response needs in their own communities, and
  - Disseminate flood information.
- Provide personnel and high-clearance vehicles for flood related activities.
- Assist the NSW SES with the delivery of evacuation warnings and evacuation orders.
- Assist the NSW SES with the conduct of evacuations.
- Provide equipment for pumping flood water out of buildings and from low-lying areas.
- Assist with the removal of caravans.
- Provide back-up radio communications.
- Assist with clean-up operations, including the hosing of flood affected properties.
- Deploy fire resources to appropriate locations if access is expected to be lost.

**1.5.21 Office of Environment and Heritage**

- Assist the NSW SES gain access to relevant studies regarding flooding, including Flood Studies and Floodplain Risk Management Studies undertaken under the Floodplain Management Program.
- Assist the NSW SES in obtaining required outputs (Section 3.1.4) from Flood Studies and Floodplain Risk Management Studies under the Floodplain Management Program which assist the NSW SES in effective



emergency response planning and incorporating information into the NSW Floods Database.

- c. Coordinate the collection of post event flood data, in consultation with the NSW SES.
- d. Provide specialist advice to the NSW SES on flood related matters on;
  - The identification of flood risks.
- e. Collect and maintain flood data relating to flood heights, velocities and discharges in coastal areas of NSW (through a contract with MHL as discussed separately).
- f. Provide data to the Bureau of Meteorology and NSW SES real-time or near real-time access to river height gauges and height data for the development of official flood warnings (through a contract with MHL as described in the Response section of this plan).
- g. Assist the NSW SES in the exercising of this Flood Sub Plan.
- h. **Parks and Wildlife Service**
  - Close and reopen Parks and Wildlife Service roads when affected by flood waters and advise the NSW SES of its status.
  - Facilitate the safe reliable access of emergency resources on National Parks and Wildlife Service managed roads.
  - Assist the NSW SES with identification of road infrastructure at risk of flooding.
  - Manage traffic on Parks and Wildlife Service roads.
  - Assist the NSW SES with the communication of warnings and information provision to the public through variable message signs and other appropriate means.

#### 1.5.22 Owners of Prescribed Dams within or upstream of Campbelltown City

| Dam                                 | Owner                     |
|-------------------------------------|---------------------------|
| Campbelltown Link Area Basin 1      | Campbelltown City Council |
| Campbelltown, North Detention Basin | Campbelltown City Council |
| Smiths Creek Ret Basin 1            | Campbelltown City Council |
| Smiths Creek Ret Basin 2            | Campbelltown City Council |
| Smiths Creek Ret Basin 3            | Campbelltown City Council |

- a. Maintain and operate the Dam Failure Warning System for their Dam(s).
- b. Contribute to the development and implementation of community engagement and capacity building programs on flooding.

- c. Consult with NSW SES on the determination of dam failure alert levels and notification arrangements when developing Dam Safety Emergency Plans.
- d. Maintain a Dam Safety Emergency Plan and provide copies to the NSW SES.
- e. Provide information on the consequences of dam failure to the NSW SES for incorporation into planning and flood intelligence.
- f. Close and evacuate at risk camping grounds/recreational areas within their managed areas.

#### 1.5.23 **Public Information Services Functional Area**

- a. When requested by NSW SES;
  - Assist the NSW SES in the establishment and operation of a Joint Media Information Centre.

#### 1.5.24 **Roads and Maritime Services**

- a. Manage traffic on state roads, state highways and waterways affected by flood waters and advise the NSW SES of their status.
- b. Facilitate the safe reliable access of emergency resources on RMS managed roads.
- c. Assist the NSW SES with identification of road infrastructure at risk of flooding.
- d. Assist in Traffic management associated with evacuations where necessary.
- e. Enter state road closure information into the Live Traffic site.
- f. Assist the NSW SES and local councils with the communication of warnings and information provision to the public through variable message signs.
- g. Cooperate with the Transport Services Functional Area Coordinator.

#### 1.5.25 **School Administration Offices (including Catholic Education Office Catholic Diocese of Wollongong, Department of Education Campbelltown Principal Network and Private Schools)**

- a. Liaise with the NSW SES and arrange for the early release of students whose travel arrangements are likely to be disrupted by flooding and/or road closures (or where required, for students to be moved to a suitable location until normal school closing time).
- b. Pass information to school bus drivers/companies and/or other schools on expected or actual impacts of flooding.
- c. Assist with coordinating the evacuation of schools when flooding or isolation is expected to occur.
- d. Provide space in schools for evacuation centres where necessary.

**1.5.26 Telecommunication Services Functional Area**

- a. When requested by NSW SES;
  - Coordinate the restoration of telephone facilities damaged by flooding.
  - Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

**1.5.27 The South West Metropolitan Transport Services Functional Area Coordinator (TSFAC)**

- a. The TSFAC will assist NSW SES, emergency services and other functional areas through the provision and coordination of traffic and transport operations as consistent with the roles of transport organisations, including;
  - The movement of emergency equipment and personnel.
  - The movement of emergency supplies and goods, including water, fuel and food.
  - The evacuation of people and animals.
  - Assistance for medical transport.
  - Transportation of animals and infectious material/dangerous goods.
  - Maintaining and operating a transport route advisory service to the NSW SES, emergency services organisations and other Functional Areas and members of the community.

**1.5.28 NSW Train Link and Sydney Trains**

- a. Operate NSW regional, interstate and urban rail services through the Campbelltown including the management of railway services affected by flood waters and advise the NSW SES.
- b. Assist the NSW SES with the movement or evacuation of people during flood response operations if required.
- c. Convey flood information and flood warnings to passengers and travellers on NSW and Sydney trains.
- d. Cooperate with, and assist the NSW SES Local Controller in relation to public safety during flood emergencies.
- e. Cooperate with the South West Metropolitan Transport Services Functional Area Coordinator.

**1.5.29 Welfare Services Functional Area**

- a. When requested by NSW SES;
  - Establish and manage evacuation centres, and provide disaster welfare services from recovery centres.
  - Administer the Personal Hardship and Distress component of the NSW Disaster Relief Scheme established to provide financial assistance to people affected by emergencies.

## PART 2 - PREPAREDNESS

### 2.1 MAINTENANCE OF THIS PLAN

- 2.1.1 The NSW SES Campbelltown City Local Controller will maintain the currency of this plan by;
- a. Ensuring that all agencies, organisations and officers mentioned in it are aware of their roles and responsibilities.
  - b. Conducting exercises to test arrangements.
  - c. Reviewing the contents of the plan;
    - After each flood operation.
    - When significant changes in land-use or community characteristics occur.
    - When new information from flood studies become available.
    - When flood control or mitigation works are implemented or altered.
    - When there are changes that alter agreed plan arrangements.
- 2.1.2 The plan is to be reviewed no less frequently than every five years.

### 2.2 FLOODPLAIN RISK MANAGEMENT

- 2.2.1 The NSW SES Campbelltown City Local Controller will ensure that;
- a. NSW SES participates in local floodplain risk management committee activities when those committees are formed, in accordance with the protocols outlined in the NSW SES Controllers' Guide.
  - b. The NSW SES Sydney Southern Region Headquarters is informed of involvement in floodplain risk management activities.

### 2.3 DEVELOPMENT OF FLOOD INTELLIGENCE

- 2.3.1 Flood intelligence describes flood behaviour and its effects on the community.
- 2.3.2 The NSW SES maintains a centralised flood intelligence system.

### 2.4 DEVELOPMENT OF WARNING SYSTEMS

- 2.4.1 The NSW SES establishes total flood warning systems for areas affected by flooding. This requires;
- a. An identification of the potential clients of flood warning information at different levels of flooding (i.e. who would be affected in floods of differing severities).
  - b. Available information about the estimated impacts of flooding at different heights.

- c. Identification of required actions and the amounts of time needed to carry them out.
  - d. Appropriate means of disseminating warnings to different clients and at different flood levels.
- 2.4.2 Council and the Bureau have installed hardware and software to monitor water levels in the Georges River and Hawkesbury-Nepean River catchments. Data gathered informs Flood Warnings issued by the Bureau and is provided to the NSW SES.

## 2.5 COMMUNITY RESILIENCE

- 2.5.1 The community needs to be as prepared as emergency agencies for the impact of all hazards (5) including flooding. . This may include:
- a. Understanding the potential risk and impact of flooding;
  - b. Preparing homes and property to reduce the impact of flooding;
  - c. Understanding warnings and other triggers for action and the safest actions to take in a flood;
  - d. Households, institutions and businesses developing plans to manage flood risks, sharing and practicing this with family, friends, employees and neighbours;
  - e. Having an emergency kit;
  - f. Being involved in local emergency planning processes.
- 2.5.2 As the combat agency, NSW SES has the primary responsibility for the collation, assessment and public dissemination of information relating to flooding (3). To do this, NSW SES will require assistance from other agencies, particularly local government councils, dam owners, and the Bureau in the development and delivery of materials.
- 2.5.3 The NSW SES Campbelltown City Local Controller, with the assistance of the Campbelltown City Council, the NSW SES Sydney Southern Region Headquarters and NSW SES State Headquarters, is responsible for the collation, assessment and public dissemination of information relating to flooding (3).
- 2.5.4 A range of tailored strategies to be employed with NSW communities include:
- a. Dissemination of flood-related brochures and booklets in flood liable areas.
  - b. Talks and displays orientated to at-risk groups, community organisations, businesses and schools.
  - c. Publicity given to this plan and to flood-orientated NSW SES activities through local media outlets, including articles in local newspapers about the flood threat and appropriate responses.



## **2.6 TRAINING**

- 2.6.1 Throughout this document there are references to functions that must be carried out by the members of the NSW SES Campbelltown City Unit. The NSW SES Campbelltown City Local Controller is responsible for ensuring that the members are;
- a. Familiar with the contents of this plan.
  - b. Trained in the skills necessary to carry out the tasks allocated to the NSW SES.

## **2.7 RESOURCES**

- 2.7.1 The NSW SES Campbelltown City Local Controller is responsible for maintaining the condition and state of readiness of NSW SES equipment and the NSW SES Campbelltown City Local Headquarters.

## PART 3 - RESPONSE

### CONTROL

#### 3.1 CONTROL ARRANGEMENTS

- 3.1.1 The NSW SES is the legislated Combat Agency for floods and is responsible for the control of flood operations. This includes the coordination of other agencies and organisations for flood management tasks.
- 3.1.2 The Local EMPLAN will operate to provide support as requested by the NSW SES Incident Controller.

#### 3.2 OPERATIONAL MANAGEMENT

- 3.2.1 NSW SES utilises the Australasian Inter-service Incident Management System (AIIMS), which is based on five principles;
  - a. Flexibility;
  - b. Functional management;
  - c. Management by objectives;
  - d. Unity of Command; and
  - e. Span of control.
- 3.2.2 AIIMS provides for different incident levels based on the complexity of management.
- 3.2.3 The Local Government Area may be divided into sectors and divisions to manage the flood event (divisions are usually a group of sectors).
- 3.2.4 Sectors and divisions may be based on floodplain classifications, geographical, physical or functional boundaries. A town, city or suburb may be one sector or split into several sectors and divisions.

#### 3.3 START OF RESPONSE OPERATIONS

- 3.3.1 This plan is always active to ensure that preparedness actions detailed in this plan are completed.
- 3.3.2 Response operations will begin;
  - a. On receipt of a Bureau of Meteorology Preliminary Flood Warning, Flood Warning, Flood Watch, Severe Thunderstorm Warning or a Severe Weather Warning for flash flooding.
  - b. On receipt of a dam failure alert.
  - c. When other evidence leads to an expectation of flooding within the council area.

- 3.3.3 Contact with the Bureau of Meteorology to discuss the development of flood warnings will normally be through the NSW SES Sydney Southern Region Headquarters and/or NSW SES State Headquarters.
- 3.3.4 The following persons and organisations will be advised of the start of response operations regardless of the location and severity of the flooding anticipated:
- a. NSW SES Sydney Southern Region Headquarters.
  - b. NSW SES Campbelltown City Unit.
  - c. Campbelltown Local Emergency Operations Controller (for transmission to the NSW Police Force Local Area Command Headquarters).
  - d. Campbelltown Local Emergency Management Officer (for transmission to appropriate council officers and departments).
  - e. Campbelltown City Council Mayor.
  - f. Other agencies listed in this plan will be advised by the Local Emergency Management Officer on the request of the NSW SES Campbelltown City Incident Controller and as appropriate to the location and nature of the threat.

### 3.4 RESPONSE STRATEGIES

- 3.4.1 The main response strategies for NSW SES flood operations include;
- a. Information Provision and Warning
    - Provision of warnings, information and advice to communities.
    - Inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for flooding.
    - Provide timely and accurate information to the community.
  - b. Property protection
    - Protect the property of residents and businesses at risk of flood damage where time and resources permit including:
      - ◆ Assistance with property protection by way of sandbagging and the lifting or transporting of furniture, personal effects, commercial stock and caravans.
      - ◆ Assistance with the protection of essential infrastructure.
  - c. Evacuation
    - Evacuation is a risk management strategy that may be used to mitigate the effects of an emergency on a community. It involves the movement of people to a safer location and their return. For an evacuation to be effective it must be appropriately planned and implemented (7).

- d. Flood Rescue
    - The rescue or safe retrieval of persons or animals trapped by floodwaters.
  - e. Resupply
    - Minimise disruption upon the community by resupplying towns and villages which have become isolated as a consequence of flooding.
    - Ensure supplies are maintained to property owners by coordinating the resupply of properties which have become isolated as a consequence of flooding.
- 3.4.2 The NSW SES Incident Controller will select the appropriate response strategy to deal with the expected impact of the flood in each sector and/or community. The impact may vary so a number of different strategies may need to be selected and implemented across the whole operational area. The available strategies for each sector and/or community are maintained by the NSW SES.
- 3.4.3 Supporting agency strategies may include;
- a. Protect the community from incidents involving fire and hazardous materials.
  - b. Maintain the welfare of communities and individuals affected by the impact of a flood.
  - c. Minimise disruption to the community by ensuring supply of essential energy and utility services.
  - d. Ensure coordinated health services are available to and accessible by the flood affected communities.
  - e. Maintain the welfare of animals affected by the impact of a flood.

### **3.5 OPERATIONS CENTRES**

- 3.5.1 The NSW SES Campbelltown City Operations Centre is located at Cnr Alderney and Townson Avenue, Minto.
- 3.5.2 Supporting EOCs are located at;
- a. The Campbelltown Emergency Operations Centre is located at Campbelltown City Council, Sark Grove, Minto NSW.

### **3.6 LIAISON**

- 3.6.1 Any agency with responsibilities identified in this plan may be requested by the NSW SES to provide liaison (including a liaison officer where necessary) to the NSW SES Campbelltown City Operations Centre, or designated Emergency Operations Centre.
- 3.6.2 In accordance with NSW EMPLAN, Liaison Officers will;

- a. Maintain communication with and convey directions/requests to their organisation or functional area;
- b. Provide advice on the status, resource availability, capabilities, actions and requirements of their organisation or functional area, and
- c. Where appropriate, have the authority to deploy the resources of their parent organisation at the request of the NSW SES Incident Controller.

### 3.7 END OF RESPONSE OPERATIONS

- 3.7.1 When the immediate danger to life and property has passed the NSW SES Incident Controller will issue an 'All Clear' message signifying that response operations have been completed. The message will be distributed through the same media outlets as earlier evacuation messages. The relevant Controller will also advise details of recovery coordination arrangements, arrangements made for clean-up operations prior to evacuees being allowed to return to their homes, and stand-down instructions for agencies not required for recovery operations.

## PLANNING

### 3.8 COLLATING SITUATIONAL INFORMATION

#### Strategy

- 3.8.1 The NSW SES maintains and records situational awareness of current impacts and response activities.

#### Actions

- 3.8.2 The NSW SES Campbelltown City Local Headquarters collates information on the current situation in the Campbelltown LGA and incorporates in Situation Reports.
- 3.8.3 The NSW SES Sydney Southern Region Headquarters collates Region-wide information for inclusion in NSW SES Region Situation Reports.
- 3.8.4 Sources of situational information during times of flooding are;
- a. **Agency Situation Reports.** Agencies and functional areas provide regular situation reports (SITREPs) to the NSW SES.
  - b. **Active Reconnaissance.** The NSW SES Incident Controller is responsible for coordinating the reconnaissance of impact areas, recording and communicating observations. Reconnaissance can be performed on the ground and using remote sensing (more commonly aerial).
  - c. The **Bureau of Meteorology's Flood Warning Centre** provides river height and rainfall information, data is available on the website <http://www.bom.gov.au/nsw/flood/>.

- d. **Manly Hydraulics Laboratory (a business unit within NSW Public Works)** automated river watch system funded by the Office of Environment and Heritage. This system provides river height and rainfall readings for a number of gauges in the Campbelltown LGA. Recent data from this system is available on the Manly Hydraulic Laboratory website: <http://www.mhl.nsw.gov.au>. A history of area floods is also available upon request via the website.
  - e. **NSW Office of Water.** This office advises flow rates and rates of rise for the Georges and Nepean Rivers. Daily river reports containing information on gauge heights and river flows are available from the website: <http://waterinfo.nsw.gov.au/>.
  - f. **NSW SES Sydney Southern Region Headquarters.** The Region Headquarters provides information on flooding and its consequences, including those in nearby council areas (this information is documented in Bulletins and Situation Reports).
  - g. **Campbelltown City Council.** Council may assist by providing information including, property use and ownership, road conditions and closures, geographic information and mapping services.
- 3.8.5 During flood operations sources of information on roads closed by flooding include;
- a. Campbelltown City Council website;  
<http://www.campbelltown.nsw.gov.au/>
  - b. Campbelltown and Macquarie Fields Police Local Area Commands.
  - c. Roads and Maritime Services;  
<http://www.rms.nsw.gov.au/> or telephone 131700
  - d. NSW SES Sydney Southern Region Headquarters.
  - e. NSW SES Campbelltown City Local Headquarters.
- 3.8.6 Situational information relating to consequences of flooding should be used to verify and validate NSW SES Flood Intelligence records.

### 3.9 PROVISION OF FLOOD INFORMATION AND WARNINGS

#### Strategy

- 3.9.1 The NSW SES Campbelltown City Local Headquarters provides advice to the NSW SES Sydney Southern Region Headquarters on current and expected impacts of flooding in the Campbelltown LGA.
- 3.9.2 The NSW SES Sydney Southern Region Headquarters issues NSW SES Flood Bulletins, NSW SES Livestock and Equipment Warnings, Evacuation Warnings and Evacuation Orders to media outlets and agencies on behalf of all NSW SES units in the Region.



## Actions

- 3.9.3 **The NSW SES Incident Controller** will ensure that the NSW SES Sydney Southern Region Controller is regularly briefed on the progress of operations.
- 3.9.4 **NSW SES Campbelltown City Local Headquarters** operations staff will be briefed regularly so that they can provide information in response to inquiries received in person or by other means such as phone or fax.
- 3.9.5 **Bureau of Meteorology Severe Thunderstorm Warning.** These are issued direct to the media by the Bureau when severe thunderstorms are expected to produce dangerous or damaging conditions, including flash flooding. Severe thunderstorms are usually smaller in scale than events covered by Flood Watches and Severe Weather Warnings.
- 3.9.6 **Bureau of Meteorology Severe Weather Warnings for Flash Flooding.** These are issued direct to the media by the Bureau and provide a warning of the possibility for flash flooding as a result of intense rainfall. These warnings are issued when severe weather is expected to affect land based communities with 6 to 24 hours. Severe Weather Warnings may also include other conditions such as Damaging Winds.
- 3.9.7 **Bureau of Meteorology Flood Watches.** Flood Watches are issued by the Bureau to advise people of the potential for flooding in a catchment area based on predicted or actual rainfall. Flood Watches will be included in NSW SES Flood Bulletins issued by the NSW SES Sydney Southern Region Headquarters.
- 3.9.8 **Bureau of Meteorology Flood Warnings.** The NSW SES Sydney Southern Region Headquarters will send a copy of Bureau Flood Warnings to the NSW SES Campbelltown City Unit. On receipt the NSW SES Incident Controller will provide the NSW SES Sydney Southern Region Headquarters with information on the estimated impacts of flooding at the predicted heights for inclusion in NSW SES Region Flood Bulletins.
- 3.9.9 **NSW SES Livestock and Equipment Warnings.** Following heavy rain or when there are indications of significant creek or river rises (even to levels below Minor Flood heights), the NSW SES Incident Controller will advise the NSW SES Sydney Southern Region Headquarters which will issue NSW SES Livestock and Equipment Warnings.
- 3.9.10 **NSW SES Local Flood Advices.** The NSW SES Incident Controller may issue Local Flood Advices for locations not covered by Bureau Flood Warnings. They may be provided verbally in response to phone inquiries but will normally be incorporated into NSW SES Region Flood Bulletins.
- 3.9.11 **NSW SES Flood Bulletins.** The NSW SES Sydney Southern Region Headquarters will regularly issue NSW SES Flood Bulletins which describe information on the estimated impacts of flooding at the predicted heights (using information from Bureau Flood Warnings and NSW SES Local Flood Advices) to NSW SES units, media outlets and agencies on behalf of all NSW SES units in the Region.

- 3.9.12 **NSW SES Evacuation Warnings and Evacuation Orders.** These are usually issued to the media by the NSW SES Region Controller on behalf of the NSW SES Incident Controller.
- 3.9.13 **Special Warnings.** Campbelltown City Council operates and maintains a flood warning system at the causeway at Cambridge Avenue, Glenfield.
- 3.9.14 **Dam Failure Alerts.** Dam failure alerts are issued to NSW SES by the dam owner, in accordance with arrangements in the Dam Safety Emergency Plan (DSEP), the system involves the Dam Owner notifying NSW SES State Headquarters Operations Communications Centre, who in turn distribute the warning to the NSW SES Region Headquarters and NSW SES Unit Headquarters.
- 3.9.15 A flow chart illustrating the notification arrangements for potential dam failure is shown in Attachment 2.
- 3.9.16 Dam failure alert levels are set in consultation with the NSW SES and are used to trigger appropriate response actions. The conditions that define each of the alert levels are listed in the relevant DSEP. Responses escalate as the alert level migrates from white to amber to red. Table 1 briefly outlines example defining conditions and appropriate NSW SES responses associated with each alert.

| Alert Level | Example Defining Condition                                                                            | NSW SES Response                                                                                    | NSW SES Warning Product                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| White       | May be a structural anomaly.<br><br>May be increased monitoring in response to a heavy rainfall event | Implements notification flowchart.<br><br>Check operational readiness.                              | This is a preliminary alert to assist the NSW SES in its preparation. This is not a public alert. |
| Amber       | Failure possible if storage level continues to rise or structural anomaly not fixed                   | Implements notification flowchart.<br><br>Warn downstream population at risk to prepare to evacuate | NSW SES Evacuation Warning                                                                        |
| Red         | Failure imminent or occurred                                                                          | Implements notification flowchart.<br><br>Evacuation of downstream populations                      | NSW SES Evacuation Order                                                                          |

Table 1: Dam Failure Alert Levels

Note: Some DSEPs will have alert levels that proceed directly from White to Red. This is the case if adequate time does not exist between the three alert levels to evacuate the downstream population at risk. The decision to omit the Amber Alert level, and the general setting of Alert levels should be undertaken in consultation with the NSW SES.

- 3.9.17 The NSW SES / Dam Owner will disseminate warnings to the population at risk of dam failure (these arrangements are specific to each dam, are negotiated between the Dam Owner and NSW SES, and are documented in the DSEP).
- 3.9.18 **Standard Emergency Warning Signal (SEWS).** This signal may be played over radio and television stations to alert communities to Evacuation Warnings, Evacuation Orders, Special Warnings or Dam-Failure Warnings. Approval to use the signal is associated with who approves the warning/order message.
- 3.9.19 **The Public Information and Inquiry Centre (PIIC)** (operated by the NSW Police Force) will answer calls from the public regarding registered evacuees.
- 3.9.20 **The Disaster Welfare Assistance line** is a central support and contact point for disaster affected people inquiring about welfare services advice and assistance. This normally operates during business hours, but can be extended when required.
- 3.9.21 **The RMS Transport Information Line** will provide advice to callers on the status of roads. The RMS website also lists road closure information.
- 3.9.22 **Campbelltown City Council** will provide information on the status of roads.
- 3.9.23 Collation and dissemination of road information is actioned as follows:
  - a. As part of Situation Reports, the NSW SES Incident Controller provides road status reports for main roads in the council area to the NSW SES Sydney Southern Region Headquarters.
  - b. The NSW SES Sydney Southern Region Headquarters distributes information on main roads to NSW SES units, media outlets and agencies as part of NSW SES Flood Bulletins.

## OPERATIONS

### 3.10 AIRCRAFT MANAGEMENT

- 3.10.1 Aircraft can be used for a variety of purposes during flood operations including evacuation, rescue, resupply, reconnaissance and emergency travel.
- 3.10.2 Air support operations will be conducted under the control of the NSW SES Region Headquarters, which may allocate aircraft to units if applicable.
- 3.10.3 NSW SES maintains the following information for the Campbelltown Council area;
  - a. Locations of suitable helicopter landing points.
  - b. Locations of suitable airports and records detailing aircraft size and type that can land at airports.
  - c. Intelligence on when access to these locations is expected to be lost.

### **3.11 ASSISTANCE FOR ANIMALS**

- 3.11.1 Matters relating to the welfare of livestock, companion animals and wildlife are to be referred to Agriculture and Animal Services Functional Area.
- 3.11.2 Requests for emergency supply and/or delivery of fodder to stranded livestock, or for livestock rescue, are to be referred to Agriculture and Animal Services Functional Area.
- 3.11.3 Requests for domestic animal rescue should be referred to the NSW SES.

### **3.12 COMMUNICATION SYSTEMS**

- 3.12.1 The primary means of communications between fixed locations is by telephone, email and facsimile.
- 3.12.2 The primary means of communication to and between deployed NSW SES resources is by GRN and mobile phone.
- 3.12.3 All liaison officers will provide their own communication links back to their parent agencies.
- 3.12.4 All other organisations will provide communications as necessary to their deployed field teams.
- 3.12.5 Back-up communications should be requested from the Local Emergency Operations Controller.

### **3.13 PRELIMINARY DEPLOYMENTS**

- 3.13.1 When flooding is expected to be severe enough to cut road access to towns, within towns and/or rural communities, the NSW SES Incident Controller will ensure that resources are in place for the distribution of foodstuffs and medical supplies to the areas that could become isolated.
- 3.13.2 When access between locations is expected to be cut, the NSW SES Incident Controller will advise appropriate agencies so that resources (including sandbags, fire fighting appliances, ambulances, etc.) are deployed to ensure that operational capability is maintained.

### **3.14 ROAD AND TRAFFIC CONTROL**

- 3.14.1 A number of roads within the council area are affected by flooding. NSW SES maintains details of these roads.
- 3.14.2 The council closes and re-opens its own roads.
- 3.14.3 The NSW Police Force has the authority to close and re-open roads but will normally only do so (if the Council or the RMS have not already acted) if public safety requires such action.
- 3.14.4 When resources permit, the NSW SES assists Council, RMS or the Police by erecting road closure signs and barriers.

- 3.14.5 In flood events, the NSW SES Incident Controller may direct the imposition of traffic control measures. The entry into flood affected areas will be controlled in accordance with the provisions of the State Emergency Service Act, 1989 (Part 5, Sections 19, 20, 21 and 22) and the State Emergency Rescue Management Act, 1989 (Part 4, Sections 60KA, 60L and 61).
- 3.14.6 Police, RMS or Council officers closing or re-opening roads or bridges affected by flooding are to advise the NSW SES Campbelltown City Local Headquarters, which will then provide a road information service to local emergency services, the public and the NSW SES Sydney Southern Region Headquarters. All such information will also be passed to the Police, RMS and the Council.

### **3.15 STRANDED TRAVELLERS**

- 3.15.1 Flood waters can strand travellers. Travellers seeking assistance will be referred to the Welfare Services Functional Area for the arrangement of emergency accommodation.

### **3.16 MANAGING PROPERTY PROTECTION OPERATIONS**

#### **Strategy**

- 3.16.1 Protect the property of residents and businesses at risk of flood damage.

#### **Actions**

- 3.16.2 The NSW SES is the responsible agency for the coordination of operations to protect property.
- 3.16.3 Property may be protected from floods by;
- a. Lifting or moving of household furniture.
  - b. Lifting or moving commercial stock and equipment.
  - c. Sandbagging to minimise entry of water into buildings.
- 3.16.4 The NSW SES maintains stocks of sandbags and a small amount of the Pallet Barrier System.
- 3.16.5 Property protection options are however very limited in the Campbelltown LGA due to the large number of properties that can be affected.

### 3.17 MANAGING FLOOD RESCUE OPERATIONS

#### Strategy

- 3.17.1 Rescue of people and animals from floods.

#### Actions

- 3.17.2 The NSW SES Sydney Southern Controller controls flood rescue in Campbelltown LGA during a flood emergency.
- 3.17.3 Flood rescues, may be carried out by accredited units in accordance with appropriate standards.
- 3.17.4 Additional flood boats and crews can be requested through the NSW SES Sydney Southern Region Headquarters.
- 3.17.5 There may be some residual population which did not evacuate during the early stages of flooding and which require rescue.

### 3.18 MANAGING EVACUATION OPERATIONS

#### Strategy

- 3.18.1 When there is a risk to public safety, evacuation is the primary strategy. Circumstances may include;
- a. Evacuation of people when their homes or businesses are likely to flood.
  - b. Evacuation of people who are unsuited to living in isolated circumstances, due to flood water closing access.
  - c. Evacuation of people where essential energy and utility services are likely to fail, have failed or where buildings have been made uninhabitable.

#### Actions

- 3.18.2 The evacuation operation will have the following stages:
- a. Decision to evacuate.
  - b. Mobilisation (mobilisation may begin prior to the decision to evacuate).
  - c. Evacuation Warning delivery.
  - d. Evacuation Order delivery.
  - e. Withdrawal.
  - f. Shelter.
  - g. Return.



- 3.18.3 During floods evacuations will be controlled by the NSW SES. Small-scale evacuations will be controlled by the NSW SES Incident Controller. Should the scale of evacuation operations be beyond the capabilities of local resources control may be escalated to the NSW SES Sydney Southern Region Controller.

### **Decision to evacuate**

- 3.18.4 In most cases the decision to evacuate rests with the NSW SES Incident Controller who exercises his/her authority in accordance with Section 22(1) of The State Emergency Service Act 1989. However, the decision to evacuate will usually be made after consultation with the NSW SES Sydney Southern Region Controller and the Local Emergency Operations Controller.
- 3.18.5 In events that require large scale evacuations, the decision to evacuate may be escalated to the Region or the State Controller.
- 3.18.6 Some people will make their own decision to evacuate earlier and move to alternate accommodation, using their own transport. This is referred to as self-managed evacuation (8).

### **Mobilisation**

- 3.18.7 The NSW SES Incident Controller will request the following personnel for doorknock teams for designated Sectors/locations:
- a. NSW SES Campbelltown City Unit members.
  - b. NSW RFS Macarthur District members via the NSW RFS Fire Control Officer.
  - c. Local Police Force officers via the local area commands.
- 3.18.8 The NSW SES Sydney Southern Region Controller will request any additional personnel required to assist with doorknock teams using;
- a. NSW SES members from the NSW SES Sydney Southern Region and surrounding NSW SES Regions.
  - b. FRNSW personnel arranged via the FRNSW Liaison Officer.
  - c. NSW RFS personnel arranged via the NSW RFS Liaison Officer.
- 3.18.9 The NSW SES Incident Controller will request the Chairperson of the LEMC to provide Council personnel to assist with traffic coordination within Sector(s)/Community.
- 3.18.10 The NSW SES Incident Controller will arrange liaison officers for Sector Command Centres.
- 3.18.11 The NSW SES Sydney Southern Region Operations Controller will request the required number of buses for Sectors via the Transport Services Functional Area.

## Delivery of Evacuation Warnings and Evacuation Orders

- 3.18.12 The NSW SES will advise the community of the requirements to evacuate. The NSW SES will issue an **Evacuation Warning** when the intent of an NSW SES Incident Controller is to warn the community of the need to prepare for a possible evacuation.
- 3.18.13 The NSW SES will issue an **Evacuation Order** when the intent of the NSW SES Incident Controller is to instruct a community to immediately evacuate in response to an imminent threat.
- 3.18.14 The NSW SES Incident Controller will distribute Evacuation Warnings and Evacuation Orders to;
- a. Sector/Division Command Centres (where established).
  - b. Campbelltown Local Emergency Operations Centre.
  - c. Campbelltown City Council.
  - d. Campbelltown and Macquarie Fields Police Local Area Commands.
  - e. Macarthur Rural Fire Service Control Centre.
  - f. Local radio Stations.
  - g. Other local agencies and specified individuals.
- 3.18.15 The NSW SES Sydney Southern Region Controller will distribute Evacuation Warnings and Evacuation Orders to;
- a. The NSW SES State Operations Centre.
  - b. The NSW SES Incident Controller.
  - c. Metropolitan media outlets via the Joint Media Information Centre.
  - d. Affected communities via dial-out warning systems where installed or applicable.
  - e. Relevant media outlets and agencies.
- 3.18.16 Evacuation Warnings and Evacuation Orders may be delivered through;
- a. Radio and television stations.
  - b. Doorknocking by emergency service personnel.
  - c. Public address systems (fixed or mobile).
  - d. Telephony-based systems (including Emergency Alert).
  - e. Two-way Radio.
- 3.18.17 The Standard Emergency Warning Signal (SEWS) may be used to precede all Evacuation Orders broadcast on Radio Stations.
- 3.18.18 Sector Commanders, where established, will distribute Evacuation Orders via Emergency Service personnel in doorknock teams to areas under threat of inundation.

- 3.18.19 Doorknock teams will work at the direction of;
- The Sector Commander if a Sector Command Centre is established.
  - The relevant Division Commander where a Sector Command Centre has not been established.
  - The Incident Controller.
- 3.18.20 Field teams conducting doorknocks will record and report back the following information to their Sector Commander/Division Commander/ Incident Controller;
- Addresses and locations of houses doorknocked and/or evacuated.
  - The number of occupants.
  - Details of support required (such as transport, medical evacuation, assistance to secure house and/or property and raise or move belongings).
  - Details of residents who refuse to comply with the Evacuation Order.
- 3.18.21 Refusal to evacuate. Field teams should not waste time dealing with people who are reluctant or refuse to comply with any Evacuation Order. These cases are to be referred to the NSW Police Force.

## Withdrawal

- 3.18.22 Evacuations will generally be carried out in stages starting from the lowest areas, low flood islands and low trapped perimeters; and progressively from higher areas.
- 3.18.23 The most desirable method of evacuation is via road using private transport. This may be supplemented by buses for car-less people. However, other means of evacuation may also be used if available and as necessary (e.g. by foot, rail, air).
- 3.18.24 Evacuees who require emergency accommodation or disaster welfare assistance will be directed to designated evacuation centres. Evacuees who have made their own accommodation arrangements will not be directed to evacuation centres. It is not possible to determine in advance how many will fall into this category.
- 3.18.25 Evacuees will:
- Move under local traffic arrangements from the relevant Sectors/Community via managed evacuation routes;
  - Continue along the suburban/regional/rural road network to allocated Evacuation Centres.
- 3.18.26 **Health Services.** The Health Services Functional Area will coordinate the evacuation of hospitals, health centres and aged care facilities (including nursing homes).

- 3.18.27 **Schools.** School administration offices (Department of Education, Catholic Education Office and Private Schools) will coordinate the evacuation of schools if not already closed.
- 3.18.28 If there is sufficient time between the start of response operations and the evacuation of communities, the NSW SES Sydney Southern Region Controller will discuss the temporary closure of appropriate schools with the Regional Director, Campbelltown Principal Network, Department of Education. This will enable pupils to stay at home or be returned home so they can be evacuated (if required) with their families.
- 3.18.29 Note that in the Campbelltown LGA, school principals may close some schools affected by flooding in the early stages of flooding.
- 3.18.30 **Caravan parks.** When an evacuation order is given occupiers of moveable dwellings should:
- a. Isolate power to movable dwellings.
  - b. Collect personal papers, medicines, a change of clothing, toiletries and bedclothes.
  - c. Lift the other contents in any remaining dwellings as high as possible.
  - d. Move to friends, relatives or a designated evacuation centre if they have their own transport, or move to the caravan office to await transport.
  - e. If undertaking self-managed evacuation, register their movements with the caravan park management upon leaving the park.
- 3.18.31 Where possible, dwellings that can be moved will be relocated by their owners. Park managers will arrange for the relocation of moveable dwellings as required. Council and NSW SES personnel may assist if required.
- 3.18.32 Caravan park managers will ensure that their caravan park is capable of being evacuated in a timely and safe manner.
- 3.18.33 Advise the NSW SES Incident Controller of:
- a. The number of people requiring transport.
  - b. Details of any medical evacuations required.
  - c. Whether additional assistance is required to effect the evacuation.
- 3.18.34 Check that all residents and visitors are accounted for.
- 3.18.35 Inform the NSW SES Incident Controller when the evacuation of the caravan park has been completed.
- 3.18.36 Provide the NSW SES Incident Controller with a register of people that have been evacuated.

- 3.18.37 **Assistance Animals, Pets and Companion Animals of Evacuees:** Assistance animals (guide dogs, hearing assistance animals, etc.) will remain in the care of their owners throughout the evacuation. This includes transport and access into evacuation centres etc.
- 3.18.38 Where possible owners should take their companion animals with them when they are asked to evacuate. Due to safety restrictions, it may not be possible to allow companion animals to accompany their owners when being transported via aircraft or flood rescue boat. In such circumstances Agriculture and Animal Services will coordinate separate arrangements for evacuation and care of companion animals
- 3.18.39 **Transport and storage:** Transport and storage of furniture from flood threatened properties will be arranged as time and resources permit.
- 3.18.40 **Security:** The NSW Police Force will coordinate the provision of overall security for evacuated areas.
- 3.18.41 The NSW SES Incident Controller is to provide the following reports to the NSW SES Sydney Southern Region Headquarters:
- a. Advice of commencement of the evacuation of each Sector,
  - b. Half-hourly progress reports (by Sectors) during evacuations,
  - c. Advice of completion of the evacuation of each Sector.
- 3.18.42 **Assembly areas:** An assembly area is a designated location used for the assembly of emergency-affected persons before they move to temporary accommodation or a nominated evacuation centre. As such these areas do not provide welfare assistance nor are they used for long term sheltering or provision of meals. An assembly area may also be a prearranged, strategically placed area, where support response personnel, vehicles and other equipment can be held in readiness for use during an emergency.

## Shelter

- 3.18.43 **Evacuation Centres:** Evacuees will be advised to go to friends or relatives, or else be taken to the nearest accessible evacuation centre, which may initially be established at the direction of the NSW SES Incident Controller, but managed as soon as possible by Welfare Services.
- 3.18.44 **Registration:** The NSW Police Force will facilitate the requirement of Disaster Victim Registration for people evacuated to designated evacuation centres.
- 3.18.45 **Animal shelter:** Facilities to hold and care for companion animals of evacuees will be coordinated by Agriculture and Animal Services if required. If required Agriculture and Animal Services will also coordinate refuge areas for livestock (e.g. horses) where feasible.

## Return

- 3.18.46 The NSW SES Incident Controller will advise when return to evacuated areas is safe after flood waters have receded and reliable access is available.
- 3.18.47 The NSW SES Incident Controller will determine when it is safe for evacuees to return to their homes in consultation with:
- a. The Recovery Coordinating Committee (if established)
  - b. Welfare Services Functional Area Coordinator (welfare of evacuees)
  - c. Engineering Services Functional Area Co-ordinator (safety of buildings, structural integrity of levees/dams)
  - d. Health Service Functional Area Coordinator (public health)
  - e. Transport Services Functional Areas Coordinator (arrangement of transport)
  - f. The Campbelltown LEOCON
  - g. The Campbelltown City Council
  - h. NSW SES Region Controller
  - i. Other appropriate agencies/functional areas as required (mitigation and advice regarding identified risks resulting from the flood event).



- 3.18.48 Once it is considered safe to do so, the NSW SES Incident Controller will authorise the return of evacuees.
- 3.18.49 The return will be controlled by the NSW SES Incident Controller and may be conducted, at their request, by the Recovery Coordinator.

### **3.19 MANAGING RESUPPLY OPERATIONS**

- 3.19.1 The NSW SES is responsible for the coordination of the resupply of isolated communities and properties.
- 3.19.2 If isolation is expected to occur, residents should be encouraged to consider their needs and suitability for an unknown period of isolation.
- 3.19.3 If properties/communities are going to remain in locations expected to become isolated, households/retailers should be encouraged to stock up on essential supplies.
- 3.19.4 Where practicable, once supplies are delivered to the NSW SES designated loading point, the NSW SES Incident Controller will arrange for the delivery of essential foodstuffs, fuels or urgent medical supplies required by an isolated property or community.
- 3.19.5 All reasonable effects will be made to deliver supplies, however where necessary the NSW SES will prioritise the delivery of items.

#### **Resupply of Isolated Towns and Villages**

##### **Strategy**

- 3.19.6 Minimise disruption upon the community by resupplying towns and villages which have become isolated as a consequence of flooding.

##### **Actions**

- 3.19.7 The NSW SES is responsible for the coordination of the resupply of isolated communities.
- 3.19.8 If flood predictions indicate that areas are likely to become isolated, the NSW SES Incident Controller should advise retailers that they should stock up.
- 3.19.9 When isolation occurs, retailers will be expected to place orders with suppliers where they have a line of credit and to instruct those suppliers to package their goods and deliver them to loading points designated by the NSW SES.
- 3.19.10 The NSW SES is prepared to deliver mail to isolated communities but may not be able to do so according to normal Australia Post timetables.
- 3.19.11 The NSW SES will assist hospitals with resupply of linen and other consumables where able.

## Resupply of Isolated Properties

### Strategy

- 3.19.12 Ensure supplies are maintained to properties by coordinating the resupply of properties which have become isolated as a consequence of flooding.

### Actions

- 3.19.13 The resupply of isolated properties is a common requirement during floods and coordination can be difficult because requests can emanate from a variety of sources. Isolated properties may call their suppliers direct, place their orders through their own social networks or contact the NSW SES.
- 3.19.14 The principles to be applied when planning for the resupply of isolated properties are;
- a. The NSW SES will coordinate resupply and establish a schedule.
  - b. Some isolated households will not have the ability to purchase essential grocery items due to financial hardship. If an isolated household seeks resupply from the NSW SES and claims to be, or is considered to be, in dire circumstances, he/she is to be referred to Welfare Services for assessment of eligibility. Where financial eligibility criteria are met, Welfare Services will assist with the purchase of essential grocery items. Welfare Services will deliver the essential grocery items to the NSW SES designated loading point for transport.
  - c. Local suppliers will liaise with the NSW SES regarding delivery of resupply items to the designated loading point.
  - d. Local suppliers are responsible for packaging resupply items for delivery.
- 3.19.15 A flowchart illustrating the Resupply process is shown in Attachment 1. Please note that the flowchart outlines the resupply process but does not encompass all potential situations and/or outcomes.

## PART 4 - RECOVERY

### 4.1 RECOVERY COORDINATION AT THE LOCAL LEVEL

- 4.1.1 The NSW SES Campbelltown City Local Controller will ensure that planning for long-term recovery operations begins at the earliest opportunity, initially through briefing the Local Emergency Management Committee (LEMC). As soon as possible the LEMC will meet to discuss recovery implications including the need for a Local Recovery Committee. The LEMC will consider any impact assessment in determining the need for recovery arrangements. This is conveyed in the first instance to the State Emergency Operations Controller (SEOCN) for confirmation with the State Emergency Recovery Controller (SERCON).
- 4.1.2 Once the need for recovery has been identified, the SERCON, in consultation with the SEOCN, may recommend the appointment of a Local Recovery Coordinator and nominate an appropriate candidate to the Minister for Emergency Services.
- 4.1.3 The SERCON may send a representative to the LEMC and subsequent recovery meetings to provide expert recovery advice and guidance.
- 4.1.4 The NSW SES Campbelltown City Local Controller and Local Emergency Operations Controller (LEOCN) attend recovery meetings to provide an overview of the emergency response operation.
- 4.1.5 The NSW SES Region Controller, the Regional Emergency Management Officer and appropriate Regional Functional Area Coordinators will be invited to the initial local meeting and to subsequent meetings as required.
- 4.1.6 The recovery committee will:
  - a. Develop and maintain a Recovery Action Plan with an agreed exit strategy.
  - b. Monitor and coordinate the activities of agencies with responsibility for the delivery of services during recovery.
  - c. Ensure that relevant stakeholders, especially the communities affected, are involved in the development and implementation of recovery objectives and strategies and are informed of progress made.
  - d. Provide the SERCON with an end of recovery report.
  - e. Ensure the recovery is in line with the National Principles of Disaster Recovery and the NSW tenets.

### 4.2 RECOVERY COORDINATION AT THE REGION AND STATE LEVEL

- 4.2.1 In the event that an emergency affects several local areas, a Region Emergency Management Committee (REMC) will meet to discuss recovery implications including the need for a Region Recovery Committee. This is

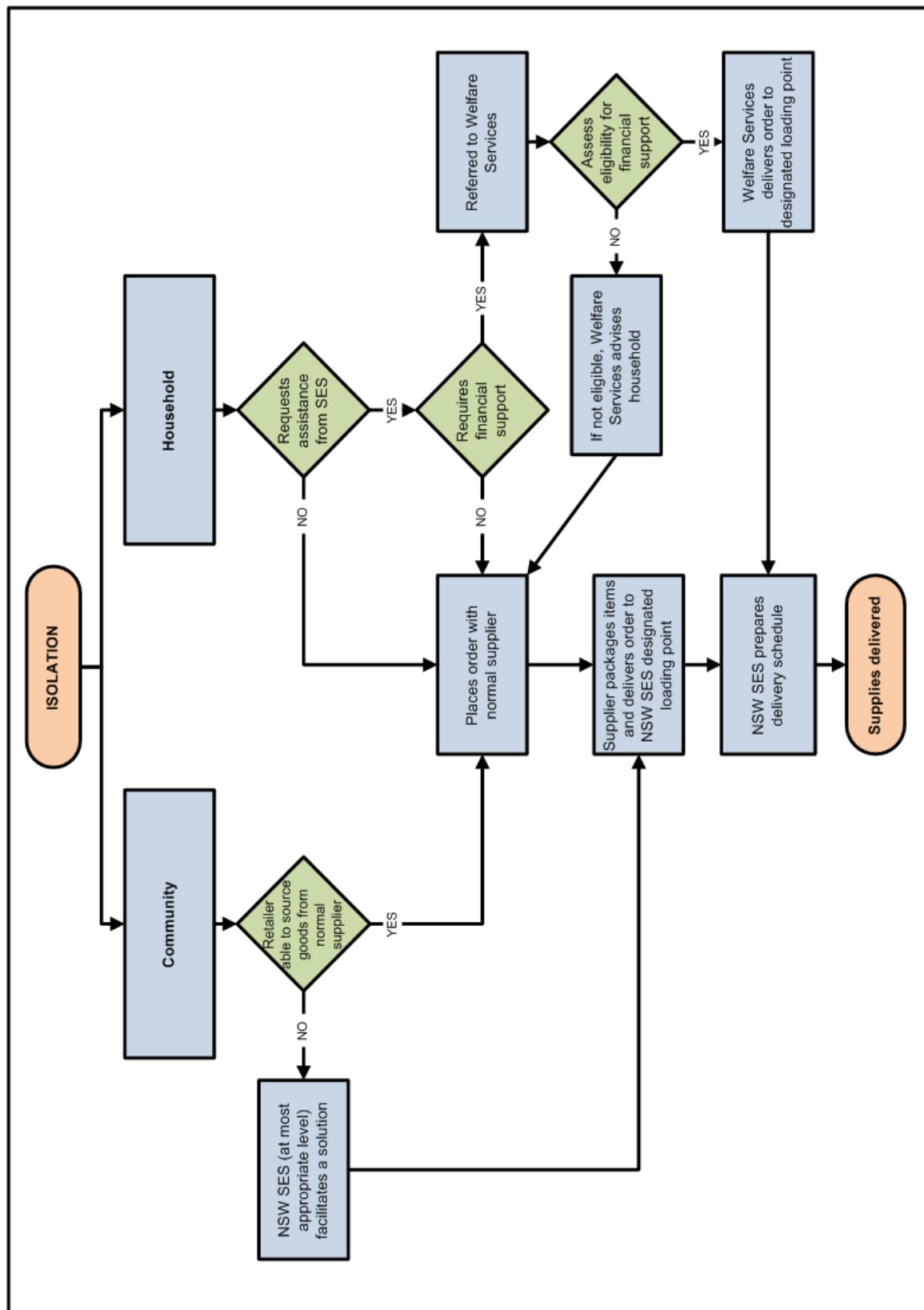
conveyed in the first instance to the SEOCON for confirmation with the SERCON.

- 4.2.2 In the event of an emergency which affects multiple regions, or is of state or national consequence, or where complex, long term recovery and reconstruction is required, it may be necessary to establish a State Recovery Committee and the appointment of a State Recovery Coordinator.

#### **4.3 ARRANGEMENTS FOR DEBRIEFS / AFTER ACTION REVIEWS**

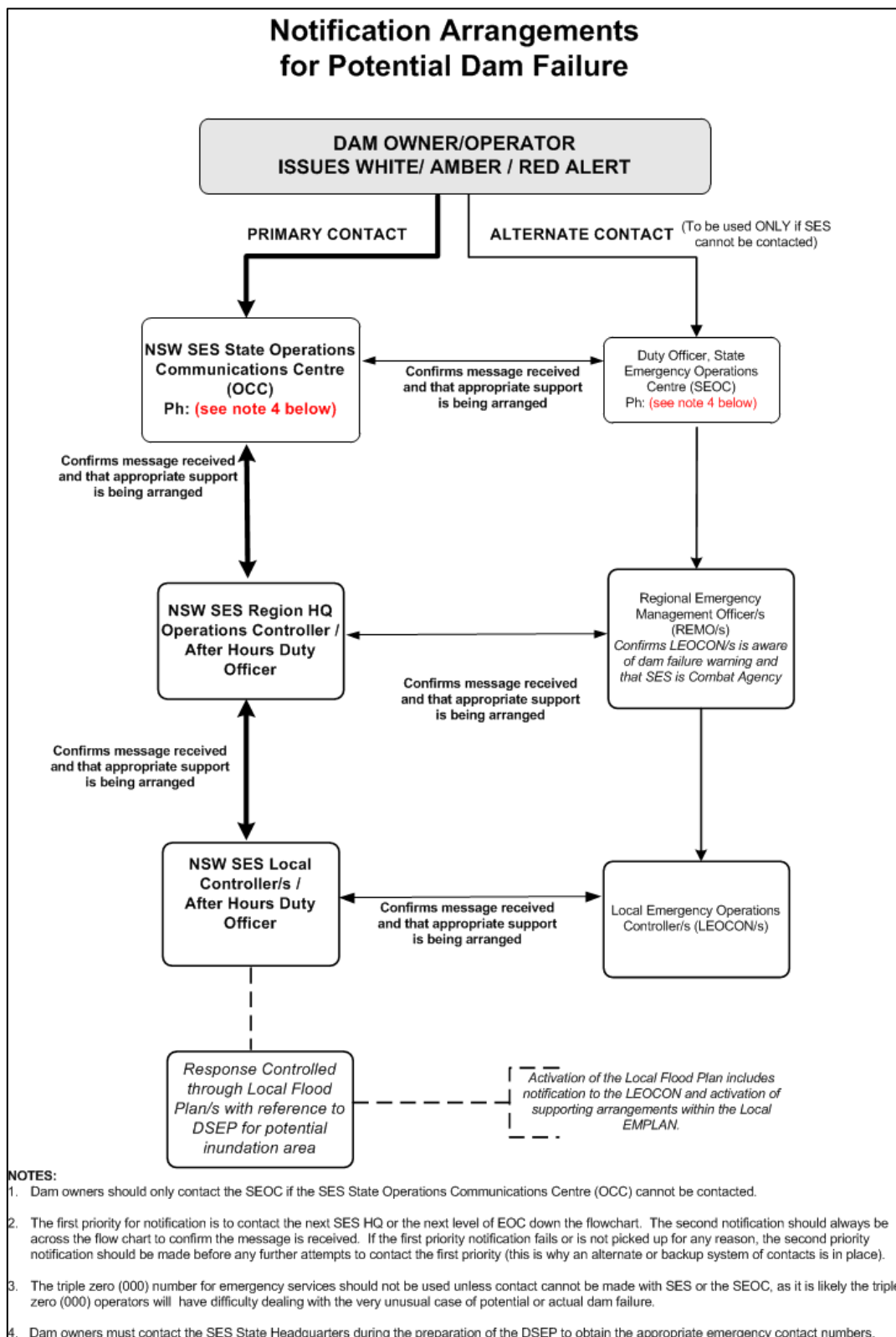
- 4.3.1 As soon as possible after flooding has abated, the NSW SES Campbelltown City Local Controller will advise participating organisations of details of response operation after action review arrangements.
- 4.3.2 The NSW SES Campbelltown City Local Controller will ensure that adequate arrangements are in place to record details of the after action review and each item requiring further action is delegated to an organisation or individual to implement.
- 4.3.3 Follow-up to ensure the satisfactory completion of these actions will be undertaken by the Campbelltown Local Emergency Management Committee.

## ATTACHMENT 1 - RESUPPLY FLOWCHART



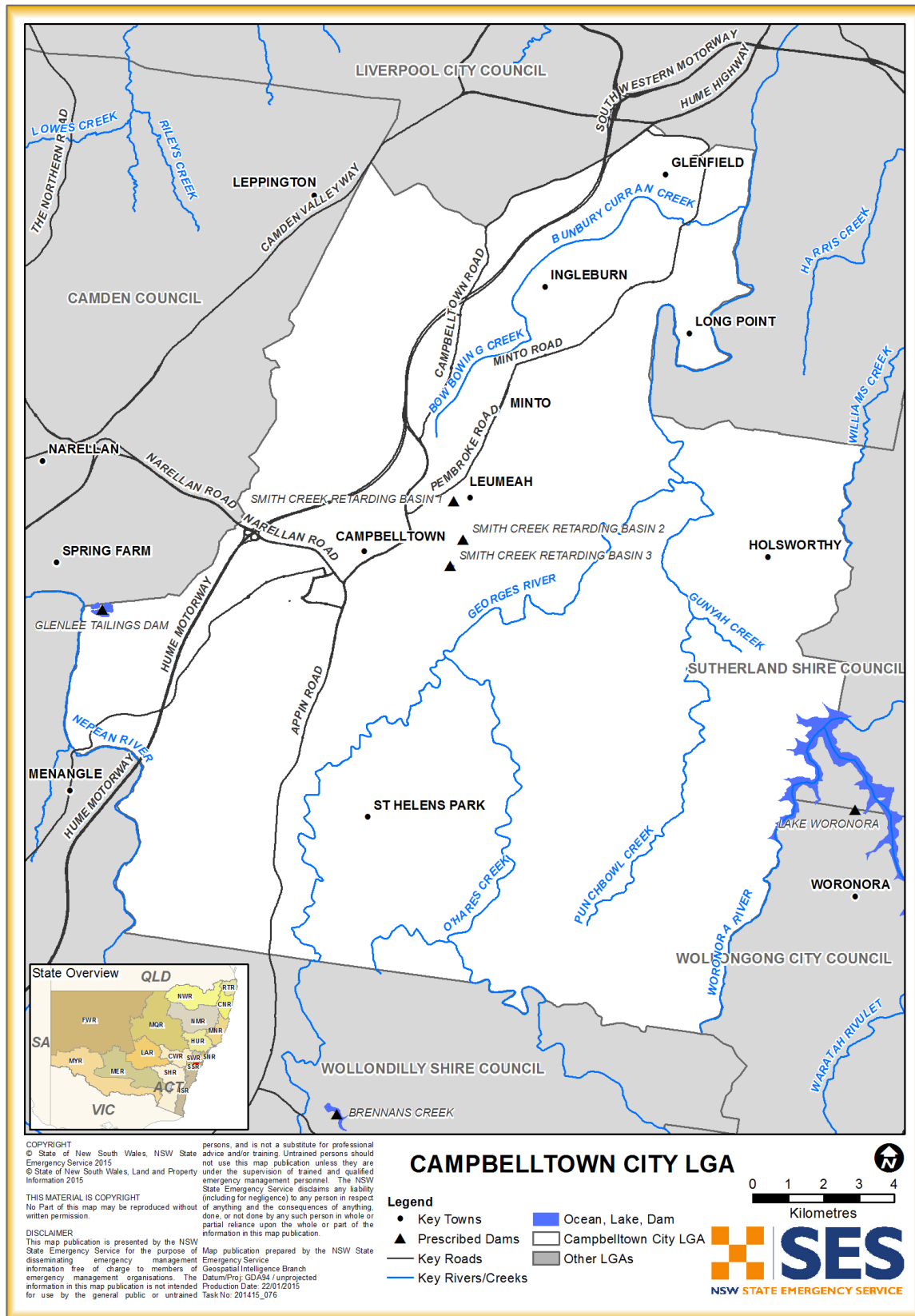
**Please Note:** The chart outlines the resupply process, but does not encompass all potential situations and outcomes.

## ATTACHMENT 2 - DAM FAILURE ALERT NOTIFICATION ARRANGEMENTS FLOWCHART





## ATTACHMENT 3 - CAMPBELLTOWN LGA MAP



## LIST OF REFERENCES

1. **Emergency Management Australia.** *Managing the floodplain: a guide to best practice in flood risk management in Australia.* s.l. : Attorney-General's Department, 2013.
2. **Department of Infrastructure, Planning and Natural Resources.** *Floodplain Development Manual.* 2005.
3. **Ministry for Police and Emergency Services (MPES).** *New South Wales State Emergency Management Plan (EMPLAN).* 2012.
4. **NSW Government.** *Local Government Act 1993 No 30.* 1993.
5. **Emergency Management Australia.** *Flood Warning: Australian Emergency Manuals Series Manual 21.* s.l. : Attorney-General's Department, 2009.
6. **NSW Government Local Government.** *Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings Regulation.* 2005.
7. **Emergency Management Australia.** *Evacuation Planning: Australian Emergency Management Handbook Series Handbook 4.* s.l. : Attorney-General's Department, 2013.
8. **SEMC Evacuations Working Group.** *Evacuation Management Guidelines.* 2014.

## **APPENDIX E**

### **SES Consultation**

Our Ref: ID1548

Your Ref:

25 January 2022

Mr Mark Wilson  
Costin Roe Consulting  
PO Box N419  
Sydney NSW 1220

email: Mark@costinroe.com.au

Dear Mr Wilson,

**Re: Flood Emergency Response Plan, 3-5 Culverston Road, Minto**

I refer to your correspondence dated 21 January 2022 regarding Flood Emergency Response Plan, 3-5 Culverston Road, Minto.

The NSW State Emergency Service (NSW SES) often receives requests for comment on private flood evacuation plans in instances where, in granting development consent, a condition requiring a private flood evacuation plan has been imposed.

In accordance with sections 3.6, A-5, L-5, L-6.9.6 and N-7 of the NSW Floodplain Development Manual the NSW SES is opposed to the use of private flood evacuation plans as a condition of development consent. Furthermore, the NSW SES does not have the statutory authority to endorse private flood evacuation plans.

Accordingly, the NSW SES is unable to provide comment on your plan, however we will include the at-risk community in developing the local flood plan and associated emergency management strategies for the area. For this to be effectively completed, NSW SES requests that the data from flood studies and floodplain risk management studies (including Bow Bowing Creek and McBarron Creek spatial data) is uploaded to the [NSW Flood Data Portal](#).

Further useful information can be found:

- NSW SES website (<https://www.ses.nsw.gov.au/disaster-tabs-header/flood/>)
- Home Emergency Plan (<http://www.seshomeemergencyplan.com.au/>)
- Emergency Business Continuity Plan  
(<http://www.sesemergencyplan.com.au/business/>)
- The Department of Planning Industry and Environment website

(<https://www.environment.nsw.gov.au/research-and-publications/publications-search/floodplain-development-manual>)

Please feel free to contact me via email at [rra@ses.nsw.gov.au](mailto:rra@ses.nsw.gov.au) should you wish to discuss any of the matters raised in this correspondence.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Elspeth O'Shannessy', is written over a faint, circular, scribbled background.

Elspeth O'Shannessy  
Planning Coordinator, Metro Zone  
**NSW State Emergency Service**

## **APPENDIX F**

### **Council Consultation**



**From:** Mark Wilson <Mark@costinroe.com.au>  
**Sent:** Monday, 14 February 2022 1:00 PM  
**To:** Ellise Mangion <Ellise.Mangion@campbelltown.nsw.gov.au>  
**Cc:** Cathy Kinsey <cathy.kinsey@campbelltown.nsw.gov.au>; Thomas Bertwistle <Thomas.Bertwistle@planning.nsw.gov.au>; Justin Crameri <jcrameri@texco.net.au>  
**Subject:** RE: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan )

Ellise,

Thanks for the comments – you are correct in the FERP is required of the consent conditions. We confirm the design has been completed based on setting floor levels greater than 0.5m above the 1%AEP as noted. The FERP considers safety for the full range of flood levels to the PMF.

We are now finalising the document and provide the following response to clarify your points. If you require anything further please let me know.

| Page | Council Comment – 10 Feb 2022                                                                                                                                                                                                                   | CRC Response – 14 Feb 2022                                                                                                                                                                                                                                                                                                                                                      |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6    | <ul style="list-style-type: none"> <li>Comment in B14 states pad levels are above the 1%, no levels have been given in the report. “infrastructure has no information on floor levels but has no reason to disbelieve the statement.</li> </ul> | <ul style="list-style-type: none"> <li>The Stage 1 and 2 building floor levels are confirmed in Section 2.2 of the document at RL 48.0m, and confirmation of the development meeting the flood planning requirements is confirmed in Section 4.2.</li> <li>Additional cross referencing has been included in the document to confirm the 1% AEP level and freeboard.</li> </ul> |
| 9    | <ul style="list-style-type: none"> <li>The defined flow path along the northern side of Rose Peyton Dr is also located on the site.</li> </ul>                                                                                                  | <ul style="list-style-type: none"> <li>The FERP covers Stage 1 and 2 development only. The flow Path on Rose Payton is relevant to overall SSD-7500 development (Stage 3 &amp; 4) however the Stage 1 and 2 development extent. No change is proposed.</li> </ul>                                                                                                               |
| 10   | <ul style="list-style-type: none"> <li>The Bow Bowing Creek AHD are RL47 AHD, not RL45 AHD.</li> </ul>                                                                                                                                          | <ul style="list-style-type: none"> <li>The invert of Bow Bowing Creek at the limit of the FERP (i.e. Stage 1 and 2) is RL 45m as quoted and confirmed by survey. The invert of 47m AHD is correct at the extent of the overall SSD7500 approval (ie near Rose Payton Drive)</li> </ul>                                                                                          |

|    |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                                                                                                                                                                                                                                                                       | however not relevant to the Stage 1 and 2 document.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 11 | <ul style="list-style-type: none"> <li>The floor level variance of 0.5m is a large variance. No issue if the proposed levels still comply with the performance criteria with respect to flooding 1%AEP + freeboard.</li> </ul>                                                                                                        | <ul style="list-style-type: none"> <li>The floor variance reference has been removed from the document. We confirm the proposed floor level of RL 48.0m is consistent with the approved SSD-7500 MOD1.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 13 | <ul style="list-style-type: none"> <li>2.6 discharge should be to Bow Bowing Creek wherever possible. Any flows excess of current discharges to other locations will require assessment and may require system upgrades.</li> </ul>                                                                                                   | <ul style="list-style-type: none"> <li>The drainage layout is consistent with the approved SSD-7500 and SSD-7500 MOD1 and proposed the majority of the site discharge via the existing .</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 18 | <ul style="list-style-type: none"> <li>3.6 this document appears to cover more than just flooding. The development footprint is &gt;2,500m<sup>2</sup> and triggers the need to include water quality treatment as set out in Council's Engineering Design Guide for Development. It is unclear if this has been included.</li> </ul> | <ul style="list-style-type: none"> <li>The document is noted to address condition B13 of SSD-7500 for the FERP only.</li> <li>As part of the reporting requirements of the conditions, Condition C7 requires detailed baseline data, contingency, incident reporting, protocols for periodic review be included in the document. The document as such includes discussion on ground conditions, drainage, climate etc have been included in the document.</li> <li>In relation to water quality, we note this document does not include water quality treatment measures (noting a separate stormwater management plan has been provided to Council). We confirm however that water quality measures have been provided for the development as set out in the approved SSD-7500 Mod1 and original SSD-7500 approvals. Refer separate submission and the approved EIS documents.</li> </ul> |
| 24 | <ul style="list-style-type: none"> <li>Figure 4.3 it should be noted that the depths shown are in the adjacent channel which is why</li> </ul>                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Noted.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | some locations show negative depths                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 31 | <ul style="list-style-type: none"> <li>• None of the locations are upstream of the site. Further with the time to peak and real time data only updated every 15 minutes, such a system is unlikely to work.</li> <li>• Detail on where the evacuation routes first cut off, this will be critical to evacuation timing and effectiveness.</li> <li>• Would the SES issue site specific warnings or simply regional messaging, regional messaging may not be relevant.</li> <li>• The PMF level is significantly greater than the 1% flood levels plus freeboard. Appendix B clearly shows the PMF is 2+m higher than the 1%AEP flood levels for Bow Bowing Creek. As such the buildings will be impacted in the event of a PMF event. The hazard category is H5 which means the buildings are at risk of structural damage.</li> </ul> | <ul style="list-style-type: none"> <li>• Real time water level gauge locations have been provided for information, noting that these gauges are not being relied on for formal warning systems. Although downstream of the catchment, the flood response in these sections of the watercourse are similar to those at the subject site.</li> <li>• Evacuation routes will be cut firstly at road crossings.</li> <li>• SES issue regional warnings based on BOM and local conditions. Although not site specific we consider the warnings relevant for the project.</li> <li>• As noted building levels are RL 48.0m. The PMF level in Bow Bowing Creek and McBarry Creek are noted to be at or below the building level (ie Location 1 - 48.0m, Location 17 - RL47.5) and up to 0.5m higher on Culverston Road (Location 20 – 48.47m). It is agreed that the PMF levels are 2+m higher than the 1%, however extremely rare for this event to occur. Further in regard to structural damage, the requirement of consent (B15) is for the building design to be such that “<i>Any structures below the 1% Annual Exceedance Probability plus 500 mm of freeboard must be constructed from flood compatible building components.</i>” The building design meets acceptable flood requirements, per the BCA and conditions of consent.</li> </ul> |
| 32 | <p>Trigger 3.</p> <ul style="list-style-type: none"> <li>• By the time the flood level is at 3m there will be inadequate time to</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• The points are noted.</li> <li>• On-site refuge is noted to be required following external evacuation routes being cut-off.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p>evacuate and Culverston Road may be cut off.</p> <ul style="list-style-type: none"> <li>• There are many possible critical events in the PMF.</li> <li>• Figure 5.3 shows that there is less than 0.35hr or 21 minutes from the start of the critical PMF event until H2 category (non trafficable by vehicles in Culverston Road). This is insufficient time to evacuate.</li> </ul>                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 33 | <p>Trigger 4.</p> <ul style="list-style-type: none"> <li>• Too late to seek this during an event. The required actions should be built into this plan. Additional in an event of this magnitude the SES is going to be very busy elsewhere.</li> <li>• These regional warning levels are unlikely to be specific enough for a small site in a relatively small catchment.</li> <li>•</li> </ul>                                                                                                                                                          | <p>The action is for on-site refuge to be undertaken until direction by SES is made.</p> <p>Refer previous comments regarding regional SES warnings.</p>                                                                                                                                                                                                                                                                                                |
| 34 | <ul style="list-style-type: none"> <li>• This site is currently very flat (east to west) and does not represent this evacuation sequence. There is also at least 3 separate flood aspects to the site, any one of which may be critical in a real event. As there are located to the south, north/north-east and west of the site, it is considered that this approach is too simplistic.</li> <li>• M5 to be replaced with M31</li> <li>• Surely they can fit more than one in a car if evacuation is the safest option. If shelter in place</li> </ul> | <ul style="list-style-type: none"> <li>• The descriptions noted are general in nature. Reference to specific parts of the site have been removed to ensure the comments remain general for the occupants.</li> <li>• M31 has been updated.</li> <li>• The number of persons in a car is not specified and does not form part of the FERP. Evacuation would be made, or on-site refuge undertaken, as set out in earlier parts of the report.</li> </ul> |

|    |                                                                         |                                                    |
|----|-------------------------------------------------------------------------|----------------------------------------------------|
|    | is safe why is everyone evacuation.                                     |                                                    |
| 37 | <ul style="list-style-type: none"> <li>Nothing in Appendix A</li> </ul> | <ul style="list-style-type: none"> <li></li> </ul> |

Best Regards,

**Mark Wilson**  
Director



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**From:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>

**Sent:** Thursday, 10 February 2022 8:53 AM

**To:** Mark Wilson <[Mark@costinroe.com.au](mailto:Mark@costinroe.com.au)>

**Cc:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>; Thomas Bertwistle <[Thomas.Bertwistle@planning.nsw.gov.au](mailto:Thomas.Bertwistle@planning.nsw.gov.au)>

**Subject:** SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan )

Hi Mark,

Cathy has reviewed the information submitted and has provided the following comments:

*It should be noted that Council's requirements for this site (and all sites in Campbelltown) is for any floor levels to be located above the 1% AEP flood level plus the appropriate freeboard. This FERP addresses flooding up to the PMF and this appears to be as a result of a SSD condition of consent, not set by Council.*

*Please note that I have reviewed this document only and none of the other documents referenced in the Plan.*

I have detailed the comments in the document in a table below, however, please review the comments in the context of the document submitted:

| Page | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6    | <ul style="list-style-type: none"> <li>Comment in B14 states pad levels are above the 1%, no levels have been given in the report. "infrastructure has no information on floor levels but has no reason to disbelieve the statement.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 9    | <ul style="list-style-type: none"> <li>The defined flow path along the northern side of Rose Peyton Dr is also located on the site.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10   | <ul style="list-style-type: none"> <li>The Bow Bowing Creek AHD are RL47 AHD, not RL45 AHD.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 11   | <ul style="list-style-type: none"> <li>The floor level variance of 0.5m is a large variance. No issue if the proposed levels still comply with the performance criteria with respect to flooding 1%AEP + freeboard.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 13   | <ul style="list-style-type: none"> <li>2.6 discharge should be to Bow Bowing Creek wherever possible. Any flows excess of current discharges to other locations will require assessment and may require system upgrades.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 18   | <ul style="list-style-type: none"> <li>3.6 this document appears to cover more than just flooding. The development footprint is &gt;2,500m<sup>2</sup> and triggers the need to include water quality treatment as set out in Council's Engineering Design Guide for Development. It is unclear if this has been included.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                             |
| 24   | <ul style="list-style-type: none"> <li>Figure 4.3 it should be noted that the depths shown are in the adjacent channel which is why some locations show negative depths</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 31   | <ul style="list-style-type: none"> <li>None of the locations are upstream of the site. Further with the time to peak and real time data only updated every 15 minutes, such a system is unlikely to work.</li> <li>Detail on where the evacuation routes first cut off, this will be critical to evacuation timing and effectiveness.</li> <li>Would the SES issue site specific warnings or simply regional messaging, regional messaging may not be relevant.</li> <li>The PMF level is significantly greater than the 1% flood levels plus freeboard. Appendix B clearly shows the PMF is 2+m higher than the 1%AEP flood levels for Bow Bowing Creek. As such the buildings will be impacted in the event of a PMF</li> </ul> |



|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | event. The hazard category is H5 which means the buildings are at risk of structural damage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 32 | <p>Trigger 3.</p> <ul style="list-style-type: none"> <li>• By the time the flood level is at 3m there will be inadequate time to evacuate and Culverston Road may be cut off.</li> <li>• There are many possible critical events in the PMF.</li> <li>• Figure 5.3 shows that there is less than 0.35hr or 21 minutes from the start of the critical PMF event until H2 category (non trafficable by vehicles in Culverston Road). This is insufficient time to evacuate.</li> </ul>                                                                                                         |
| 33 | <p>Trigger 4.</p> <ul style="list-style-type: none"> <li>• Too late to seek this during an event. The required actions should be built into this plan. Additional in an event of this magnitude the SES is going to be very busy elsewhere.</li> <li>• These regional warning levels are unlikely to be specific enough for a small site in a relatively small catchment.</li> <li>•</li> </ul>                                                                                                                                                                                              |
| 34 | <ul style="list-style-type: none"> <li>• This site is currently very flat (east to west) and does not represent this evacuation sequence. There is also at least 3 separate flood aspects to the site, any one of which may be critical in a real event. As there are located to the south, north/north-east and west of the site, it is considered that this approach is too simplistic.</li> <li>• M5 to be replaced with M31</li> <li>• Surely they can fit more that one in a car if evacuation is the safest option. If shelter in place is safe why is everyone evacuation.</li> </ul> |
| 37 | <ul style="list-style-type: none"> <li>• Nothing in Appendix A</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Please contact me for any further enquiries, I'm available Monday, Tuesday and Thursday.

**Ellise Mangion**

Senior Development Planner

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Campbelltown City Council acknowledges and respects the Dharawal people as traditional custodians of this land, and extends these respects to all Aboriginal Elders, past and present, and people from all Aboriginal nations.

**From:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>  
**Sent:** Tuesday, 8 February 2022 9:28 AM  
**To:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>  
**Subject:** FW: SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan )  
**Importance:** High

Hi Ellise

Please find attached comments on the FERP (also attached). Please note that I have reviewed this document only and none of the other documents referenced in the Plan.

It should be noted that Council's requirements for this site (and all sites in Campbelltown) is for any floor levels to be located above the 1% AEP flood level plus the appropriate freeboard. This FERP addresses flooding up to the PMF and this appears to be as a result of a SSD condition of consent, not set by Council.

Comments are offered as a commentary on the document as provided.

Happy to discuss if necessary.

Kind regards

Cathy Kinsey

Strategic Infrastructure and Transport Coordinator

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**From:** Mark Wilson <[Mark@costinroe.com.au](mailto:Mark@costinroe.com.au)>  
**Sent:** Thursday, 20 January 2022 6:38 PM  
**To:** Cathy Kinsey <[cathy.kinsey@campbelltown.nsw.gov.au](mailto:cathy.kinsey@campbelltown.nsw.gov.au)>  
**Cc:** Ellise Mangion <[Ellise.Mangion@campbelltown.nsw.gov.au](mailto:Ellise.Mangion@campbelltown.nsw.gov.au)>; Xavier Cure <[Xavier.Cure@costinroe.com.au](mailto:Xavier.Cure@costinroe.com.au)>; Justin Crameri <[jcrameri@texco.net.au](mailto:jcrameri@texco.net.au)>  
**Subject:** SSD7500 Mod1 (3-5 Culverston Road, Minto) - Condition B13 Consultation (Flood Emergency Response Plan )  
**Importance:** High

Cathy,

I spoke to you briefly regarding the SSD7500 MOD1 development at the above site late last year. I hope you had a great Christmas and new year.

We have prepared the Flood Emergency Response Plan (FERP) required to be included in the Construction Environmental Management Plan under Consent Condition B13 of SSD7500. The condition requires submission of and consultation with Council in relation to the plan.

We note the current plan covers the Stage 1 and 2 development. Stages 3 and 4 are not included in the submitted document.

Attached is the DRAFT FERP for comment. The plan covers all required items of the approval, and has been completed in accordance with the approved concept management plans and information provided by you and Catchment Simulation Solutions as part of the package.

The submission to the department will be made next week. I will call to discuss the FERP with you.

Note Condition B13 also requires consultation with SES and we are having some difficulty finding the relevant person to make the submission to and consultation – do you have contact details for this purpose?

Thanking you in advance for your assistance.

**Best Regards,**  
**Mark Wilson**  
**Director**

## **APPENDIX E – WASTE MANAGEMENT PLAN**

# Minto Logistics Hub Modification – Waste Management Plan

A Submission to Texco

11<sup>th</sup> February 2022



## Prepared by

MRA Consulting Group (MRA)  
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## Version History

| Ver | Date       | Status | Author         | Signature                                                                             |
|-----|------------|--------|----------------|---------------------------------------------------------------------------------------|
| 0.1 | 20/01/2022 | Draft  | James Cosgrove | -                                                                                     |
| 1   | 21/01/2022 | Final  | James Cosgrove |  |
| 1.1 | 31/01/2022 | Update | James Cosgrove | -                                                                                     |
| 1.2 | 11/02/2022 | Update | James Cosgrove | -                                                                                     |

## Disclaimer

This report has been prepared by MRA Consulting Group for Texco. MRA (ABN 13 143 273 812) does not accept responsibility for any use of, or reliance on, the contents of this document by any third party.

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## Glossary

| Terminology | Definition                                 |
|-------------|--------------------------------------------|
| AS          | Australian Standard                        |
| C&D         | Construction and Demolition                |
| CDCP        | Campbelltown Development Control Plan 2015 |
| CLEP        | Campbelltown Local Environmental Plan 2015 |
| DCP         | Development Control Plan                   |
| ENM         | Excavated Natural Material                 |
| EPA         | Environment Protection Authority           |
| LGA         | Local Government Area                      |
| MGB         | Mobile Garbage Bin                         |
| MSW         | Municipal Solid Waste                      |
| SEPP        | State Environmental Planning Policy        |
| WMP         | Waste Management Plan                      |
| WSEA        | Western Sydney Employment Area             |
| WSP         | Waste Service Provider                     |
| WSRA        | Waste Storage and Recycling Area           |

# 1 Introduction

MRA Consulting Group (MRA) was engaged by Texco to prepare an Operational Waste Management Plan (OWMP) for the proposed modification to an approved industrial development (SSD 7500), located at 5 & 9 Culverston Road, Minto. The site is legally described as Lot 400 DP87571 and Lot 3 DP817793, with a total approximate area of 30.63 Ha. The site is situated east of the Hume Highway and Campbelltown Road, approximately 39km southwest of Sydney's CBD.

The proposal aims to develop four industrial warehouse buildings, to be delivered in stages, with ancillary car parking to be delivered with each stage (see Appendix A for staging plans). The proposed modification has undergone assessment by the Department of Planning, Industry and Environment (DPIE) and is subject to conditions which this WMP aims to address as follows (see Table 1).

**Table 1: Table of conditions of consent related to waste management**

|                              |            |                         |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------|------------|-------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Prior to Construction</b> | <b>B29</b> | <b>Waste Management</b> | <b>Classification</b>        | The Applicant must ensure that any waste generated from construction or operation activities on the site is classified in accordance with the EPA's Waste Classification Guidelines (DECCW, 2009), or any superseding document and disposed of to a facility that may lawfully accept the waste.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Prior to Construction</b> | <b>B30</b> | <b>Waste Management</b> | <b>Waste Management Plan</b> | <p>Prior to the commencement of construction, the Applicant must prepare a Waste Management Plan (WMP) for the Development to the satisfaction of the Secretary. The WMP shall form part of the CEMP required by Condition C2 and the OEMP required by Condition C4 and be prepared in accordance with Condition C7. The Plan shall:</p> <ul style="list-style-type: none"> <li>a) detail the type and quantity of waste to be generated during construction and operation of the Development;</li> <li>b) classify any waste generated from construction or operation activities on the site in accordance with the EPA's Waste Classification Guidelines (DECCW, 2009), or any superseding document and disposed of to a facility that may lawfully accept the waste;</li> <li>c) describe the handling, storage and disposal of all waste streams generated on site, consistent with the Protection of the Environment Operations Act 1997, Protection of the Environment Operations (Waste) Regulation 2014 and the Waste Classification Guideline (Department of Environment, Climate Change and Water, 2009);</li> <li>d) detail the materials to be reused or recycled, either on or offsite; and</li> <li>e) include the Management and Mitigation Measures included in Appendix B</li> </ul> |
| <b>Prior to Construction</b> | <b>B31</b> | <b>Waste Management</b> | <b>Waste Management Plan</b> | <p>The Applicant must:</p> <ul style="list-style-type: none"> <li>a) not commence operation until the Waste Management Plan required by Condition B30 is approved by the Secretary; and</li> <li>b) implement the most recent version of the Waste Management Plan approved by the Secretary for the duration of the Development.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

The site is also subject to the Campbelltown Development Control Plan 2015 (CDCP) which lists the following objectives related to waste management, which have each been addressed in this WMP:

- Ensure waste systems are easy to use and that, where necessary, collection vehicles are able to access buildings to remove waste.
- Ensure that developments meet requirements for long term sustainability and best practice.
- Ensure developments achieve effective waste and resource recovery management.

- Ensure that developments protect and enhance the quality of life for the community.
- Ensure healthy and safe practices for the storage, handling and collection of waste and recycling materials.
- Prevent stormwater pollution that may occur as a result of poor or incorrect storage and management arrangements for recyclables and waste.
- Promote the principles of Ecologically Sustainable Development through appropriate resource recovery and recycling, leading to a reduction in the consumption of finite natural resources.
- To ensure that appropriate facilities are provided for the storage and collection of industrial waste and recycled materials.

Overall, the scope of the proposed modification (see Section 2.1) will contribute a similar or reduced impact as it relates to the management of waste through the remediation and construction of the proposed industrial warehouses. Waste management through early works and construction was addressed by Arcadis in a *Waste Management Assessment* dated 1 April 2016 – relevant sections relating to construction and demolition works from this report are included as Appendix D for reference. Early works have already commenced at the site and construction works are expected to result in a similar build scale compared to the approved DA and therefore, waste management classifications in accordance with classification guidelines, expected volumes and management methods detailed in the Arcadis report are assumed to remain relevant for the development as modified.

This WMP focuses on addressing changes to the site affecting operational management of waste according to the proposed modification, specifically referring to Stages 1 and 2 of the development, and applying latest waste generation rates and management methods.

## 2 Background

### 2.1 Description of Proposed Development

Construction, fit-out and operation of a warehouse and logistics hub with 93,378m<sup>2</sup> of gross floor area (GFA) including:

- Four warehouse buildings for warehousing and distribution uses, with ancillary offices, comprised of:
  - Stage 1: 9,078 m<sup>2</sup> of warehousing GFA and 300 m<sup>2</sup> of office GFA;
  - Stage 2: 9,500 m<sup>2</sup> of warehousing GFA and 500 m<sup>2</sup> of office GFA;
  - Stage 3: 31,000 m<sup>2</sup> of warehousing GFA and 1,000 m<sup>2</sup> of office GFA;
  - Stage 4: 40,000 m<sup>2</sup> of warehousing GFA and 2,000 m<sup>2</sup> of office GFA;
- 8.8 hectares of external hardstand storage space for warehousing and logistics uses;
- Bulk earthworks;
- Demolition of existing structures and hardstand areas;
- Remediation works;
- Upgrades to existing on-site infrastructure;
- Loading docks;
- Car parking;
- Site landscaping; and
- Estate and building identification signage.

The proposed modifications are summarised as follows:

- Modified staging to deliver the development in four stages in a revised order.
- Reduction in warehouse GFA, reduction in office GFA and increased external storage area for Warehouse 1B.
- Reduction in warehouse GFA, reduction in office GFA and increased external storage area for Warehouse 1C.
- Increase in warehouse GFA for Warehouse 1D to reflect revised boundary line between Warehouse 1D and Warehouse 1C.
- Revised car parking provision for Warehouses 1B, 1C and 1D to reflect amended GFA and tenant requirements.
- Reduction in total GFA from 112,000m<sup>2</sup> to 93,378m<sup>2</sup>.
- Increase in outdoor storage area from 6.9 hectares to 8.8 hectares.

### 2.2 Location

The subject site is located at 5 & 9 Culverston Road, Minto (see site location in Figure 1); situated in the Campbelltown City Council local government area (LGA).



Figure 1: Aerial view of the subject site (5-9 Culverston Road, Minto)



Source: Urbis.

## 2.3 Strategies

Waste management for the site considers better practice, necessary equipment, and integration with other guidance documents including the NSW Waste and Sustainable Materials Strategy (NSW DPIE, 2021), and National Waste Policy: Less Waste, More Resources (DEE, 2018). The key policy aims that are considered are:

- Avoidance (to prevent the generation of waste);
- Reduce the amount of waste (including hazardous waste) for disposal;
- Manage waste as a resource; and
- Ensure that waste treatment, disposal, recovery and re-use are undertaken in a safe, scientific and environmentally sound manner.

The site is subject to the Campbelltown Development Control Plan (CDCP) 2015, including objectives and principles outlined in Section 1.

## 2.4 Assumptions

This report is a WMP, forming part of the development documentation and assumes:

- Drawings and information that have been used in waste management planning for this WMP are the latest development plans from the project architect, Watch This Space Design, dated 6<sup>th</sup> October 2021;

- Waste generation volumes are based on waste generation rates outlined in NSW EPA (2019) *Better Practice Guidelines for Resource Recovery in Residential Dwellings* and NSW EPA (2012) *Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities*. Waste management equipment and infrastructure recommendations have been made according to estimated waste generation;
- This WMP is a living document and therefore, waste management equipment and systems described in this report are subject to change based on future operations and available technology.



## 3 Operational Waste

### 3.1 Overview

Ongoing waste management requirements for the site will result of the daily operation of industrial warehouse and ancillary offices. Waste storage and management will be separate for each building as identified in attached plans (see Appendix A). Centralised waste storage areas for each warehouse will be maintained in or near loading docks for each warehouse, ensuring the waste management area is easily accessible by building tenants and waste collection vehicles for servicing.

The following calculations are based off the mobile garbage bin (MGB) dimensions sourced from NSW EPA's *Better Practice Guideline for Waste Management and Recycling in Commercial and Industrial Facilities (2012)* and *Better Practice Guide for Resource Recovery in Residential Developments (2019)* (Table 2 and Table 3).

**Table 2: MGB capacity and footprint**

| Bin Capacity | Height (mm) | Depth (mm) | Width (mm) | Footprint (Approx. m <sup>2</sup> ) |
|--------------|-------------|------------|------------|-------------------------------------|
| 240L         | 1,080       | 735        | 580        | 0.43                                |
| 660L         | 1,250       | 850        | 1,370      | 1.16                                |
| 1,100L       | 1,470       | 1,245      | 1,370      | 1.71                                |

Source: *Better practice guide for resource recovery in residential developments (2019)*.

**Table 3: Bulk bin capacity and footprint**

| Bin Capacity      | Height (mm)   | Depth (mm)    | Width (mm)    | Footprint (Approx. m <sup>2</sup> ) |
|-------------------|---------------|---------------|---------------|-------------------------------------|
| 1.5m <sup>3</sup> | 910 – 1,250   | 905 – 1,000   | 1,805 – 2,010 | 1.63 – 2.01                         |
| 3m <sup>3</sup>   | 1,020 – 1,580 | 1,470 – 1,700 | 1,400 – 2,010 | 2.1 – 3.4                           |
| 4.5m <sup>3</sup> | 1,440 – 2,014 | 1,605 – 1,900 | 1,800 – 2,010 | 2.9 – 3.8                           |
| 6m <sup>3</sup>   | 1,650         | 1,900         | 2,000         | 3.8                                 |

Source: *Better practice guide for resource recovery in residential developments (2019)*.

### 3.2 Estimated Waste and Recycling Generation

The waste volume calculation for both waste and recycling for the proposed development is shown below. Table 4 Below outlines waste generation rates applicable for the proposed uses at the site, as derived from the CDCP and NSW EPA guidelines where the CDCP does not provide specific reference to a use.

**Table 4: Model waste generation rates according to EPA guidelines**

| Premises type/use     | Waste generation (L/100m <sup>2</sup> /day) | Recycling Generation (L/100m <sup>2</sup> /day) |
|-----------------------|---------------------------------------------|-------------------------------------------------|
| Office                | 10                                          | 15                                              |
| Industrial Warehouse* | 5                                           | 10                                              |

*\*the CDCP and EPA Guidelines do not specify waste generation rates for industrial uses and therefore, MRA has relied on prior experience across other LGAs to determine this figure.*

*Note: Site assumed to operate 7 days a week.*

With consideration to the above model waste generation rates, Table 5 below outlines the expected waste generation rates for the proposed development. Waste generation has been calculated based on site specific breakdown of commercial and industrial uses proposed.

**Table 5: Site Waste and Recycling Generation**

|                   |           |           | Daily Waste generation (L) |           | Weekly Waste generation (L) |           |
|-------------------|-----------|-----------|----------------------------|-----------|-----------------------------|-----------|
| Building          | Use       | Area (m²) | General Waste              | Recycling | General Waste               | Recycling |
| Stage 1 Warehouse | Warehouse | 9,078     | 454                        | 908       | 3,178                       | 6,356     |
|                   | Office    | 500       | 50                         | 75        | 350                         | 525       |
|                   | subtotal  |           | 504                        | 983       | 3,528                       | 7,056     |
| Stage 2 Warehouse | Warehouse | 9,500     | 475                        | 950       | 3,325                       | 6,650     |
|                   | Office    | 500       | 50                         | 75        | 350                         | 525       |
|                   | subtotal  |           | 525                        | 1,025     | 3,675                       | 7,350     |
| Total             |           |           | 1,029                      | 2,008     | 7,203                       | 14,406    |

*\*Recycling waste volumes may be able to be managed with the use of a commercial paper/cardboard baler or other recycling waste diversion methods. For industrial uses, paper and cardboard in the form of packaging can make up a significant proportion of the total recyclable material generated. This should be done per building or individual industrial tenancy with uses which generate a substantial proportion of paper/cardboard compared to other recyclable material.*

Greater resource recovery can be achieved by further diverting paper and cardboard materials from the above recycling volumes. This stream is cleaner and means the materials collected are less contaminated and much more likely able to be converted into recycled paper and fibre products.

### 3.3 Waste Storage Requirements

With consideration to the scale of the development and number of individual site uses, a separate waste management and storage area will be allocated for each building. Site waste storage areas for each building will be sized and located to accommodate necessary waste storage bins and other associated waste management equipment according to estimated site waste generation rates outlined in Section 3.2.

Individual tenancies will be responsible for retaining smaller internal bins for each relevant waste stream which can then be emptied into larger bins for collection as necessary. Internal bins should be retained in offices spaces and industrial buildings (on the industrial floor) and any other areas where waste will be generated in large quantities without direct access to the building waste storage area. Staff for each building will be responsible for transferring waste from each unit to the recycling collection bins and general waste bins or compactor for each warehouse.

Given the large volumes of general waste predicted to be generated onsite, there are several options that site management can use for stage 1 of the industrial estate. Table 6 below outlines the number and type of waste management containers that may be suitable for the proposed industrial uses, including frequency of waste collection.

**Table 6: Industrial unit waste storage and collection options**

| Area                     | Waste Stream        | L/Week | Option 1                                        | Option 2                                       | Option 3                                        |
|--------------------------|---------------------|--------|-------------------------------------------------|------------------------------------------------|-------------------------------------------------|
| <b>Stage 1 Warehouse</b> | General Waste       | 3,528  | 3 x 1,100L + 1 x 660L / collected once per week | 1 x 3m <sup>3</sup> / collected twice per week | 1 x 4.5m <sup>3</sup> / collected once per week |
|                          | Mixed Recycling     | 2,822  | 3 x 1,100L / collected once per week            | 1 x 3m <sup>3</sup> / once per week            | -                                               |
|                          | Paper and Cardboard | 4,234  | 1 x 4.5m <sup>3</sup> / once per week           | 1 x 3m <sup>3</sup> / twice per week           | Carboard Baler / bales collected as required    |
| <b>Stage 2 Warehouse</b> | General Waste       | 3,675  | 3 x 1,100L + 1 x 660L / collected once per week | 1 x 3m <sup>3</sup> / collected twice per week | 1 x 4.5m <sup>3</sup> / collected once per week |
|                          | Mixed Recycling     | 2,940  | 3 x 1,100L / collected once per week            | 1 x 3m <sup>3</sup> / once per week            | -                                               |
|                          | Paper and Cardboard | 4,410  | 1 x 4.5m <sup>3</sup> / once per week           | 1 x 3m <sup>3</sup> / twice per week           | Carboard Baler / bales collected as required    |

*Note 1: for the purpose of the above calculations, paper and cardboard is assumed to make up 60% of the volume of recyclable material.*

*Note 2: Mixed recycling stream includes materials such as plastic film and packaging.*

### 3.4 Waste Stream Management

#### Bulk bins and Mobile Garbage Bins collected on a regular basis

Site management may elect to incorporate regular collection of bulk waste bins (front lift truck) and Mobile Garbage Bins (MGBs) (rear lift truck) for the management of general waste and recycling onsite.

These are calculated assumptions and actual requirements will be dependent on the waste generated by the associated industrial tenancies once operation has commenced. With the presence of food in the waste, more frequent collections may be required to prevent odour.

#### Waste Compaction Units

Site management will include a number of waste streams outside of general waste and recycling. All waste materials should be stored in the main waste storage areas at the rear of the site and separated by material type where necessary and/or applicable.

Space may be provisioned for the storage of a waste compactor in each warehouse. The waste compactor will be a hook-lift or Roll-On Roll-Off (RORO) unit which is collected at a schedule agreed with the elected private waste contractor. This type of compactor has a capacity of 10,000L and a compaction ratio of 5:1. A fully loaded and compacted unit would therefore have a capacity of 50,000L. A compactor of this size typically has a footprint of 9.2m<sup>2</sup>. Compactor units can also be fitted with keycard and weighing to record disposal by multiple tenancies or users.

Each warehouse as part of stage 1 of the development can have its own waste compactor to service industrial units. General waste from café activities can also be disposed of using the warehouse 1 compactor if sited for easy access.

Large volumes of recycling waste are expected to be generated as a result of onsite warehouse activity. Equipment to reduce volumes of cardboard and plastic waste will allow the number of bins required onsite to be reduced.

### **Cardboard Baler**

A paper and cardboard baler may be appropriate for use in each of the industrial units as this material is typically bulky and easily separated from other recycling streams. Paper and cardboard is also valuable as a separated commodity and may be able to be collected for free or sold for a profit, rather than incurring a fee for collection. Further information and examples of commercial cardboard balers is included in Appendix B.

Each warehouse as part of the Stage 1 development can have its own baler to service industrial units.

#### **3.4.1 Pallets**

Used pallets are expected to be generated in large quantities through general operations at the site. Site management can manage pallets in several ways, including (but not limited to):

- Organising a take-back agreement with suppliers for empty pallets; or
- Arrange collection of broken, damaged and/or unwanted pallets by a specialist pallet recycler.

Pallets will be removed from the site by the supplier for reuse where possible or removed by a suitably qualified waste contractor on a flatbed truck to be recycled at a pallet recycling facility.

#### **3.4.2 Soft Plastics and Cardboard**

Soft plastic from pallet and other plastic wrap is expected to be generated in large quantities at the site. In addition, cardboard from packaging is also expected to be generated in large quantities.

Given the volume of soft plastics and cardboard to be generated at the site, a commercial scale baler unit is proposed to manage these types of waste material (see Appendix B for examples). A single baler unit is capable of managing multiple different streams, however only one material type can be baled at a time. As such additional interim storage bins for soft plastics and cardboard may be made available near the proposed baler to store material prior to being baled for transport offsite.

Baled material will be collected by a suitably qualified waste contractor on a regular basis or as required by a flatbed truck.

#### **3.4.3 Printer/Toner Cartridges**

The site will produce a small amount of printer/toner cartridges as part of regular operation of office spaces. Waste cartridges will be stored after being expended and collected by the printing/toner supplier for reuse.

#### **3.4.4 Problem Wastes**

Cooking oil, light globes, paint tins, and cleaning chemicals are all examples of problem wastes which are unable to be disposed of through typical general waste or recycling services. Wastes such as these are to be stored separately from general waste and recycling bins if applicable. Liquid waste should be stored in an undercover, bunded area which mitigates the risk of spills or leaks and prevents runoff to stormwater drains.

Hazardous or special waste (where relevant) is to be stored in accordance with WorkSafe requirements and guidelines produced by the NSW EPA.

#### **3.4.5 Secure Document Destruction**

The site may require secure bins for disposal and destruction of sensitive documents. Typically, these bins are 240L size with locked lids to prevent retrieval of documents. Waste trucks with shredders would collect and destroy the documents, either on a scheduled service or on an as-needs basis.

### 3.4.6 Bulky Waste Management

Some of the site uses may generate bulky waste items (fit-out, whitegoods, etc), including items that would be returned to suppliers from deliveries (such as pallets, crates, etc). Additional space for the storage of bulky waste items will be available for each tenancy, nearby the bin storage areas.

Bulky waste will be serviced as required and can be organised between individual tenancies and their waste contractor(s). Bulky waste collection vehicles will be similar in size to those that will provide waste collection for general waste and recycling and therefore, no additional access considerations are likely to be necessary for bulky waste collection access.

## 4 Waste Management Systems

### 4.1 Collection Method and Loading Areas

Collection points for the waste service provider (WSP) and areas for handling and loading are as follows:

- Bins and other waste material storage will occur in each warehouse loading dock;
- Collection of waste materials will occur directly from the waste storage areas located at each warehouse loading dock;
- Clear, safe, accessible and convenient space for handling of bins and equipment and loading of collection vehicles; and
- Identifiable areas where staff can recognise and avoid any risk associated with moving vehicles, and bin moving and handling.

Table 7 outlines relevant requirements and specifications.

**Table 7: Collection points and loading areas requirements and specifications**

| Component                                    |                                                                                                        | Specification                                                                                                                                                                                                                                                                                   |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Collection point</b>                      | Allow safe waste collection and loading operations                                                     | <ul style="list-style-type: none"> <li>- Adequate clearance and manoeuvring space; and</li> <li>- Sufficient clearance for the safe handling of materials and equipment.</li> </ul>                                                                                                             |
| <b>Vehicle manoeuvring and loading space</b> | Truck space for adequate lift clearance, manoeuvring and operation for a contractor collection vehicle | <ul style="list-style-type: none"> <li>- Collection from the waste storage area directly;</li> <li>- Adequate collection area free from overhanging tree limbs that may impede operational height clearances; and</li> <li>- The provision of space clear of vehicle parking spaces.</li> </ul> |
| <b>Operating times</b>                       | Appropriate collection times to limit noise and traffic disturbance                                    | <ul style="list-style-type: none"> <li>- Collection times will be arranged during general business hours.</li> </ul>                                                                                                                                                                            |



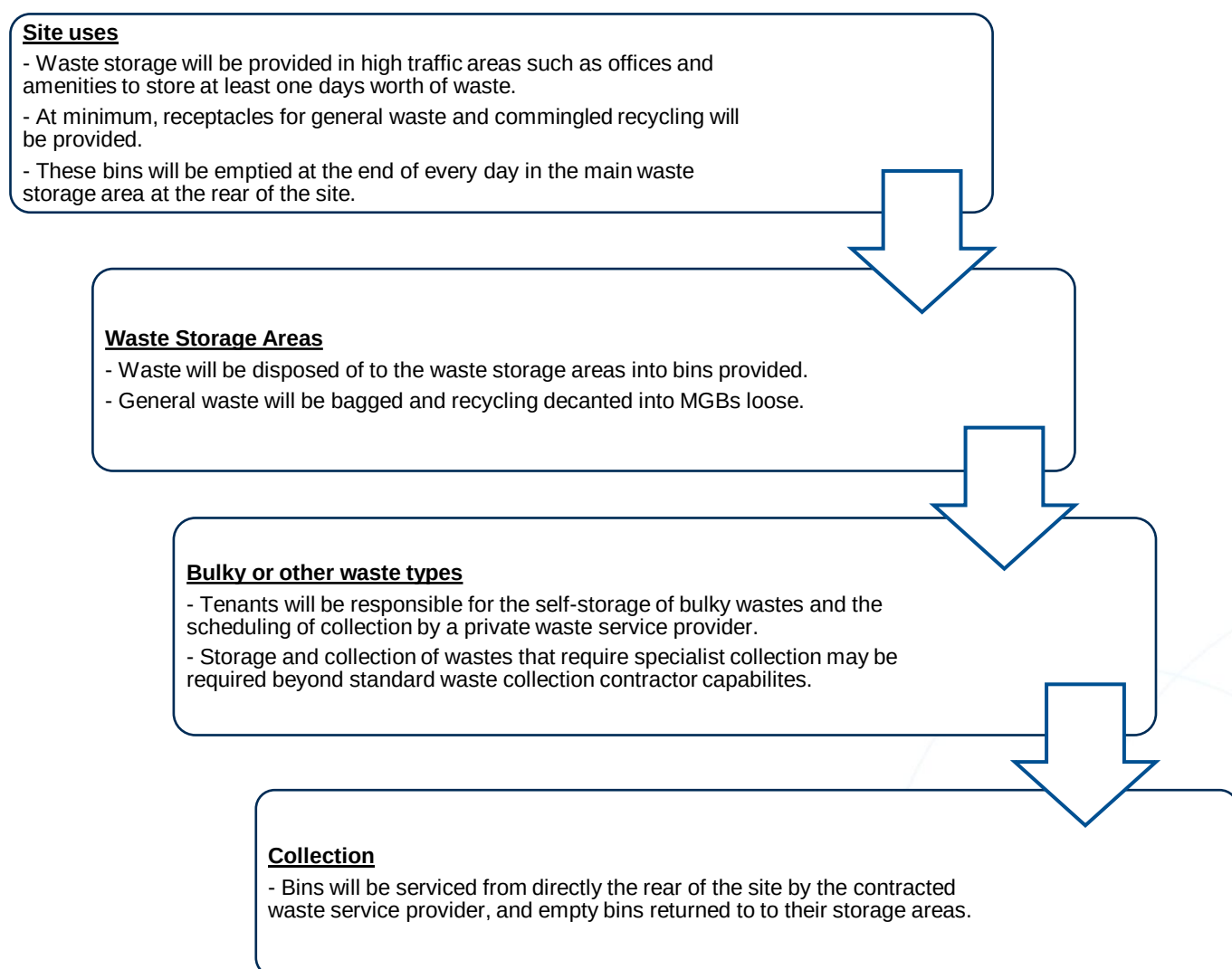
The internal roadways have been designed and constructed to facilitate the movement and manoeuvring of a waste collection vehicle, the dimensions of which are shown below:

**Table 8: Waste Collection Vehicle Dimensions**

| Waste Vehicle Dimensions |           |                              |            |
|--------------------------|-----------|------------------------------|------------|
| <b>Length</b>            | Up to 11m | <b>Operational Clearance</b> | Up to 8.5m |
| <b>Width</b>             | 2.5m      | <b>Turning Circle</b>        | 25m        |
| <b>Height</b>            | 3.9m      | <b>Vehicle Tare Weight</b>   | 16.5t      |
|                          |           | <b>Maximum Payload</b>       | 11t        |

The below flow chart (Figure 2) outlines the movement of waste from generation to collection.

**Figure 2: Waste flow diagram**



## 4.2 Site Waste Management System

Building management will be responsible for the cleaning, disposal, and collection services for waste at the site. Should any issues impacting on the operational efficiency, safety and suitability of waste management be identified, site users should inform their waste contractor to revise waste management procedures as necessary.

Building management will be responsible for the following with regards to waste management:

- Using this WMP to inform waste management operations, design and infrastructure;
- Providing educational materials and information to users outlining:
  - Waste management system and use/location of associated equipment,
  - Sorting methods for recycled waste, awareness of waste management procedures for waste minimisation, maximising recovery and reducing contamination of recyclables,
  - Improving facility management results (lessen equipment damage, reduce littering, and achieve cleanliness).
- Making information available to users, site staff and visitors about waste management procedures;
- Ensuring correct signage is installed and maintained in waste storage and service areas;
- Encouraging waste avoidance and achievement of resource recovery targets;
- Providing operational management for delivery of waste objectives;
- Holding a valid and current contract with licensed collector(s) for waste and recycling collection;
- Ensuring waste service providers access the site appropriately;
- Ensuring timing of waste collections does not clash with peak traffic periods in relation to general operation of the site;
- Organising waste, recycling and bulky pick-ups by elected contractor;
- Organising, maintaining and cleaning the waste storage and service areas;
- Using contracts to define the allocation of responsibilities with site management and staff;
- Monitoring any vermin and pest issues and arranging appropriate controls (traps or fumigating) and maintenance of doors or other points of potential entry; and
- Holding a valid and current contract with a licensed contractor for any specialty waste collections and disposal (should the need arise);
- Maintaining general cleanliness when using waste storage areas to prevent the occurrence of odour, vermin or amenity issues;
- Organise additional bins or services as required;
- Recording hazards or damages related to the waste storage areas, including but not limited to:
  - Damaged bins,
  - Illegally dumped items,
  - Apparent miss-use of waste storage areas (such as vandalism, contamination, etc), and
  - Odour, vermin or amenity issues.
- Ensuring that workplace safety requirements according to WorkCover NSW Occupational Health and Safety are upheld.

## 4.3 Waste Storage Area

Waste storage areas in the loading dock of each industrial warehouse will be according to the following specifications:

- Signage for safety and waste bin identification;
- Safety precautions, staff training and signage for bins;
- Floors constructed of concrete or other approved solid, impervious material that can be cleaned easily;
- Grading and draining to an approved drainage fitting located in the room to facilitate bin washing;

- Smooth, even surface covered with vertical wall and plinth faces;
- Adequate supply of water with hose cock as close as practicable to the doorway;
- Security and lighting.

#### 4.4 Signage

Signage that promotes resource recovery, waste minimisation, safety and amenity follows the Australian Standard for safety signs for the occupational environment (Standards Australia, 1994).

Signage will be designed to consider language and non-English speaking backgrounds, vision impairment and accessibility. Illustrative graphics must form a minimum 50% of the area of the signage. Signage is to be prominently posted in the waste storage area and near small bin receptacles, indicating:

- Details regarding acceptable recyclables;
- Recyclables are to be decanted loose (not bagged)
- Contact details for arranging the disposal of bulky items;
- The area is to be kept tidy.

Standard signage requirements and guidance for application apply (see Appendix C).

#### 4.5 Prevention of Pollution and Litter Reduction

To minimise dispersion of litter and prevent pollution (to water and land via contamination of runoff, dust and hazardous materials), site management will also be responsible for:

- Maintenance of open and common site areas;
- Ensuring individual bin storage areas and the main waste storage area are maintained and kept clean;
- Ensuring bins are retained within the designated storage area(s);
- Identification and appropriate disposal of goods with hazardous material content (paints, e-waste, fluorescent tubes);
- Taking action to prevent unauthorised dumping of waste; and
- Cleaning up any spillage that may occur during waste servicing.

#### 4.6 Bin Wash

Bin wash facilities will be made available near the waste storage area for use as required. Bin wash area will have the following features:

- Hot/cold water hose cock;
- Drainage to sewer;
- Space to safely manoeuvre, handle and wash bins; and
- Bunding to prevent overflow of water to other areas.

Waste material generated at the site through use of the site will be generally consistent with non-putrescible material types and therefore, bin washing is expected to be irregular in frequency.

## 5 References

Campbelltown City Council (2015) Development Control Plan.

Campbelltown City Council (2015) Local Environmental Plan.

Department of Environment and Energy (2018) National Waste Policy: Less Waste, More Resources.  
Available at: <https://www.awe.gov.au/environment/protection/waste/publications/national-waste-policy-2018>.

NSW EPA (2012) Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities, Australian Standards and Statutory Requirements.

NSW EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21.

NSW EPA (2016) Recycling Signs, Posters and Symbols. Available at:  
<http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm>.

NSW EPA (2019) NSW Better Practice Guide for Resource Recovery in Residential Developments, Australian Standards and Statutory Requirements.

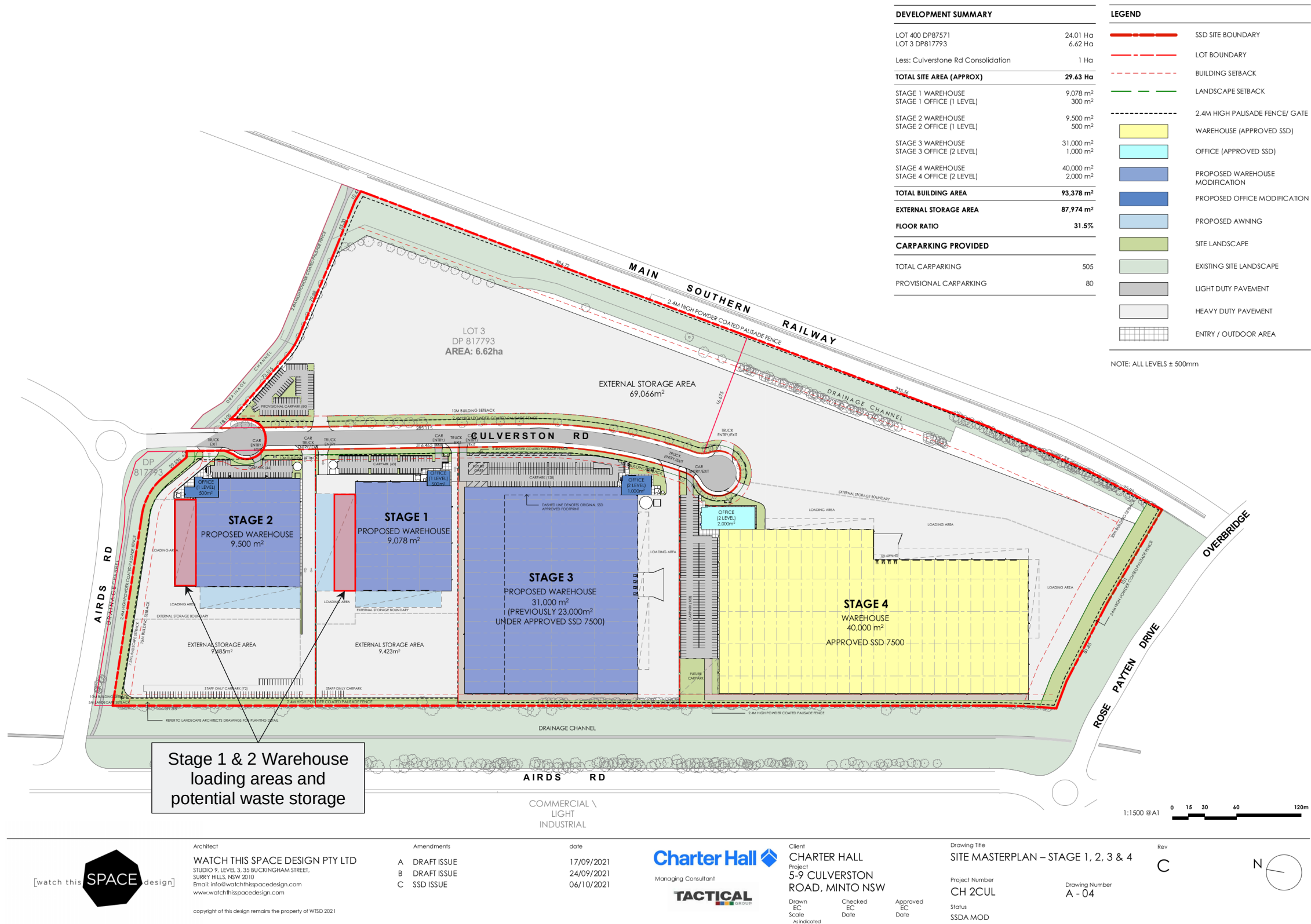
Standards Australia (1994) AS 1319: Safety signs for the occupational environment, Homebush, NSW: Standards Australia.

Standards Australia (2008) AS 4123 Mobile waste containers.

WorkCover (2011) Managing Work Environment Facilities Code of Practice.

# Appendix A Site Plans

Figure 3: Overall site plan



Source: Watch This Space Design, 2021.



## Appendix B Cardboard and Soft Plastics Baler Examples

### MILL SIZE BALERS MODEL H500 & H600

#### KEY FEATURES

AUTOMATIC DOOR OPENING • SAFE & EASY TO USE & MAINTAIN • LOW NOISE LEVEL

#### INFORMATION

#### H600 Details:

- Ideal Bale Size to maximise use of transport
- Small Footprint - No need for space to rear of machine
- Low machine height - 2,17 metres
- Multiple pressing options
- Full Automatic upper door opening to maximise input of material
- Automatic door opening, closing & bale ejection
- Emergency Stop facility



Safe and easy bale out system.  
Very easy to operate.

With a pressing force of up to 50/60 tonnes, the balers makes bales of up to 450/500 kg.

The H600 bales are tied with steel wires.



| Model                        | H500                     | H600                      |
|------------------------------|--------------------------|---------------------------|
| <b>Bale weight*</b>          | 350 - 450 kg             | 350 - 500 kg              |
| <b>Bale size (mm)</b>        | H: 800 W: 1200 D: 800    | H: 800 W: 1200 D: 1100    |
| <b>Pressing cycle</b>        | 41 sec.                  | 36 sec.                   |
| <b>Degree of compression</b> | 85 - 90%                 | 85 - 90%                  |
| <b>Working pressure</b>      | Up to 50 tonnes          | Up to 60 tonnes           |
| <b>Door opening (mm)</b>     | Height (from floor): 940 | Height (from floor): 1180 |
| <b>Feed opening</b>          | H: 670 W: 1200 D: 780    | H: 550 W: 1160 D: 780     |
| <b>Dimensions</b>            |                          |                           |
| <b>H500:</b>                 |                          |                           |
| Height:                      | 3100 mm                  |                           |
| Width:                       | 1600 mm                  |                           |
| Depth:                       | 1300 mm                  |                           |
| <b>H600:</b>                 |                          |                           |
| Height:                      | 2170 mm                  |                           |
| Width:                       | 1890 mm                  |                           |
| Depth:                       | 1400 mm                  |                           |
| <b>Weight</b>                | 2050 kg                  | 2430 kg                   |
| <b>Motor</b>                 | 7,5 kW - 400 V / 25 Amp  | 7,5 kW - 400 V / 25 Amp   |
| <b>Noise level</b>           | 70 dB                    | 70 dB                     |
| <b>Approval</b>              | CE & GS                  | CE & GS                   |

\* Depending upon kind of material

#### Mil-tek WORLDWIDE

- The leading supplier of balers and waste presses worldwide.
- Dedicated sales and service offices in more than 50 locations around the world.
- The widest and most flexible product range on the market.
- Providing solutions to reduce cost and comply with legislation.
- Implementing recycling and modern waste handling techniques worldwide.
- Save Time, Save Space, Save Money.

#### AIR POWERED BALERS

Ver. 2009/EN\_INT-5271

CE GS ISO 14001



Model 102 Cardboard & Plastic    Model 205 Cardboard & Plastic    Model 305 Cardboard & Plastic    Model 306 Cardboard & Plastic    Model 509 Cardboard & Plastic    X-Press General Waste    Model 101 Can Crusher

www.Mil-tek.com



## Appendix C Standard Signage

### Waste Signage

Signs for garbage, recycling and organics bins should comply with the standard signs promoted by the NSW Office of Environment and Heritage (NSW OEH, 2008b).

Standard symbols for use in signage, bin facade and educational materials are promoted through the NSW Environment Protection Authority. They are available for download from the NSW EPA website (NSW EPA 2016), in black and white and colour versions. The Australian Standard series AS 4123 (Part 7) details colours for mobile waste containers (Standards Australia, 2008).



### Safety Signs

The design and use of safety signs for waste and recycling rooms and enclosures should comply with AS 1319 (Standards Australia 1994). Safety signs should be used to regulate, and control safety related to behaviour, warn of hazards and provide emergency information, including fire protection information. Below are some examples.

## Appendix D    Arcadis Waste Assessment (Construction Waste)

## 2 LEGISLATION AND POLICY CONTEXT

The waste management for the construction and operational phases of the Proposal is influenced by a series of pieces of legislation, policies and plans. Documents relevant to the Proposal are outlined in Table 2.

*Table 2 Legislation and policy context*

| Instrument                                        | Relevant provisions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Waste Policy: Less Waste, More Resources | <p>The National Waste Policy, published in 2009 by the Federal Government, outlines the plans for waste management in Australia until 2020. The desired outcomes of the Policy are designed to steer the direction of waste management by all lower tiers of government. These outcomes are:</p> <ul style="list-style-type: none"> <li>▪ Australia manages waste, including hazardous waste, in an environmentally safe, scientific and sound manner, and has reduced the amount per capita of waste disposed</li> <li>▪ Waste streams are routinely managed as a resource to achieve better environmental, social and economic outcomes, including saving water, energy, greenhouse gas emissions and finite resources, and to increase productivity of the land</li> <li>▪ Australia has increased the amount of products, goods and materials that can be readily and safely used for other purposes at end-of-life</li> <li>▪ Opportunities to safely manage, reduce and recycle waste are available to all Australians, including approaches that have been tailored to meet the needs of remote and rural communities</li> <li>▪ Risks associated with waste and hazardous waste substances are understood and managed to minimise current and intergenerational legacy issues             <ul style="list-style-type: none"> <li>▪ Australia manages its products, materials and chemicals that contain potentially hazardous substances, in particular those that are persistent, bio-accumulative and toxic, consistent with its international obligations and using best available evidence, techniques and technologies</li> <li>▪ Local stockpiling of hazardous waste has been significantly reduced particularly from rural and remote areas</li> <li>▪ There are consistent and clear requirements for disposal of hazardous material, and for content labelling of manufactured goods, that also provide a level playing field for Australian manufacturers and importers and informs consumers</li> </ul> </li> <li>▪ Interaction of regulatory frameworks and operational processes across government agencies aligns with world's best practice and facilitates waste avoidance, resource recovery and appropriate end-of-life management arrangements within their own operations as well as by businesses and the community</li> </ul> |

| Instrument                                  | Relevant provisions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                             | <ul style="list-style-type: none"> <li>▪ There are efficient and effective Australian markets for waste and recovered resources, and local technology and innovation are sought after internationally               <ul style="list-style-type: none"> <li>▪ Businesses, including those in manufacturing and the supply chain, embrace innovations that support the creation of value from potential waste streams and minimise their environmental footprint</li> <li>▪ As part of a seamless national economy, there is a consistent and coherent regulatory environment that facilitates business activity in resource recovery and waste management</li> </ul> </li> <li>▪ Governments, industry and the community have embraced product stewardship and extended producer responsibility approaches               <ul style="list-style-type: none"> <li>▪ Product stewardship and extended producer responsibility is adopted in business operations, leading to improvements in the design, longevity and disassembly of products, a reduction in hazardous content, less waste, and more thoughtful consumer choices</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Product Stewardship Act 2011 (Commonwealth) | <p>Product Stewardship refers to the 'whole of life' custodianship of products within the economy. This is achieved by encouraging or requiring manufacturers, importers, distributors and other persons to take responsibility for their products. Through Product Stewardship the amount of waste going to landfill is reduced, recycling rates are increased, valuable resource are reused for new products, and harmful substances in some products are prevented from entering the natural environment. The framework includes voluntary, co-regulatory and mandatory product stewardship.</p> <p>Voluntary accreditation schemes encourage product stewardship without the need for regulation. Organisations accredited under the legislation must meet specific requirements that ensure they carry out their activities in a transparent and accountable manner. Co-regulatory product stewardship schemes are delivered by industry and regulated by the Australian Government. The exact requirements are detailed separately in the regulations for the scheme. Mandatory product stewardship places legal obligations on parties to take certain actions in relation to a product. Requirements may include labelling of products, making arrangements for recycling products at end-of-life, or requiring a deposit and refund to be applied to a product.</p> <p>Items currently included in the 2015-2016 product list include:</p> <ol style="list-style-type: none"> <li>1. Waste architectural and decorative paint</li> <li>2. End-of-life batteries less than 5kg in weight.</li> </ol> <p>Until recently, end-of-life air conditioners and refrigerators with small gas charges were included in the product list. These items are now excluded as a cost benefit analysis of product stewardship of these products did not show a net benefit to society. Each year the Minister reviews the list for incorporation of suitable new product listings. The National Television and Computer Recycling Scheme came into effect in 2011 through the <i>Product Stewardship (Televisions and Computers) Regulations 2011</i>. The regulation supports a co-regulatory recycling scheme for televisions, computers, printers and computer products. In 2014 the federal government established a voluntary, industry-led tyre product stewardship scheme. The scheme is administered by Tyre Stewardship Australia (TSA). TSA aims to increase domestic tyre recycling, expand the market for tyre-derived products and</p> |

| Instrument                                                          | Relevant provisions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NSW Waste Avoidance and Resource Recovery Act 2001 (WARR Act)       | <p>reduce the number of Australian end-of-life tyres that are sent to landfill, exported as baled tyres or illegally dumped.</p> <p>The NSW <i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act) promotes waste avoidance and resource recovery by developing appropriate strategies and programs. The WARR Act includes the following objectives:</p> <ul style="list-style-type: none"> <li>▪ Encourage the most efficient use of resource and to reduce environmental harm in accordance with the principles of ecologically sustainable development</li> <li>▪ Ensure that resource management options considered against the waste hierarchy</li> <li>▪ Provide for the continual reduction in waste generation</li> <li>▪ Minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste</li> <li>▪ Ensure the industry shares with the community the responsibility for reducing and dealing with waste</li> <li>▪ Ensure the efficient funding of waste and resource management planning, programs and service delivery</li> <li>▪ Achieve integrated waste and resource management planning, programs and service delivery on a state-wide basis</li> <li>▪ Assist in the achievement of the objectives of the <i>Protection of the Environment Operations Act 1997</i></li> </ul> |
| Waste Avoidance and Resource Recovery Strategy 2014 (WARR Strategy) | <p>The WARR Strategy aims to reduce the environmental impact of waste and improve the well-being of the NSW environment, community and economy across the following key areas:</p> <p><b>Principles</b></p> <ul style="list-style-type: none"> <li>▪ Avoid and reduce waste generation – reducing the amount of material entering the waste management or recycling systems by using products and materials more efficiently and avoiding unnecessary product use</li> <li>▪ Increase recycling – increasing the amount of material that is recycled within the productive economy</li> <li>▪ Divert more waste from landfill – increasing the amount of material in the waste stream that is diverted from landfill to alternative uses, such as recycling and energy recovery</li> <li>▪ Manage problem wastes better – separating and managing materials in the waste stream that hinder effective recycling</li> <li>▪ Reduce litter – reducing the presence of litter in the environment</li> <li>▪ Reduce illegal dumping – reducing the incidence of illegal dumping in the community</li> </ul>                                                                                                                                                                                                                                                                                           |

| Instrument                                                                                           | Relevant provisions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                      | <p><b>Targets</b></p> <p>Key to delivering the WARR Strategy in the key results areas are the following targets:</p> <ul style="list-style-type: none"> <li>▪ By 2021-22, reduce the rate of waste generation per capita</li> <li>▪ By 2021-22, increase recycling rates for: <ul style="list-style-type: none"> <li>▪ municipal solid waste from 52% (in 2010-11) to 70%</li> <li>▪ commercial and industrial waste from 57% (in 2010-11) to 70%</li> <li>▪ construction and demolition waste from 75% (in 2010-11) to 80%</li> </ul> </li> <li>▪ By 2021-22, increase the waste diverted from landfill from 63% (in 2010-11) to 75%</li> <li>▪ By 2021-22, establish or upgrade 86 drop-off facilities or services for management of household problem wastes state-wide</li> <li>▪ By 2016-17, reduce the number of litter items by 40% compared with 2011-12 levels and then continue to reduce litter items to 2021-22</li> <li>▪ By 2016-17: <ul style="list-style-type: none"> <li>▪ Reduce the incidence of illegal dumping of waste detected in Sydney and the Illawarra, Hunter and Central Coast regions by 30% compared with 2010-11</li> <li>▪ Establish baseline data to allow target-setting in other parts of the state</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                |
| <p><i>Protection of the Environment Operations Act 1997</i></p>                                      | <p>The <i>Protection of the Environment Operations Act</i> 1997 (POEO Act) defines 'waste' for regulatory purposes and establishes management and licensing requirements along with offence provisions to deliver environmentally appropriate outcomes. The POEO Act includes protection of the environment policies (PEPs), which are used to establish environmental standards, goals, protocols. They provide both the framework for Government decisions that affect the environment and the means of adopting Australia-wide environment protection measures set by the National Environment Protection Council.</p> <p>The POEO Act contains a list of activities that require an environmental protection licence and provides a single licensing arrangement to replace the different licences and approvals under existing separate Acts relating to air pollution, water pollution, noise pollution and waste management. License holders are required to prepare and implement pollution incident response management plans and environmental audits. They also have a duty notify the regulating authority of pollution incidents.</p> <p>Scheduled and non-scheduled activities are regulated under the POEO Act, where the EPA is the appropriate regulatory authority. Under this legislation clean-up notices, prevention notices and fees can be issued. The Act has a three tier regime of offences relating to disposal of waste and corresponding penalties. Acts that render harm to the environment and acts of wilful negligence carry the most serious penalties.</p> |
| <p><i>Protection of the Environment Operations (Waste) Regulation 2014 (Proximity Principle)</i></p> | <p>The proximity principle restricts the distance waste can be transported by motor vehicle if generated in NSW. Waste cannot be transported more than 150km from the place of generation except where there are no lawful waste disposal facilities within 150km or if the disposal facility is located in another state and the border is within 150km of where the waste was generated.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |



### 3 WASTE GENERATION

#### 3.1 Construction

Waste generating activities during the construction phase are listed in Table 3, with the types of waste these activities are likely to generate being listed in Table 4.

Table 3: Waste generating activities during construction

| Phase 1 - Site preparation, bulk earthworks and utilities infrastructure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Phase 2 - Construction and fit-out of:<br>Stage 1 Warehousing (approx. 40,000m <sup>2</sup> );<br>Stage 2 Warehousing (approx. 44,000m <sup>2</sup> );<br>Stage 3 warehousing (approx. 23,000m <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Phase 3 - Miscellaneous structural construction and finishing works                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Site Preparation</p> <ul style="list-style-type: none"> <li>Vegetation clearance</li> <li>Demolition of hail mesh structures</li> <li>Demolition of existing infrastructure</li> <li>Removal of pavements</li> <li>Removal of redundant services</li> <li>Bulk earth works</li> </ul> <p>Early works</p> <ul style="list-style-type: none"> <li>Surplus materials and offcuts from construction compound fencing and hoardings</li> <li>Bales and silt fences from installation of temporary sediment and erosion control measures</li> <li>Surplus materials and offcuts from installation of temporary site offices and amenities</li> <li>Excavation of fill when installing drainage and other utilities</li> </ul> | <p>Construction</p> <ul style="list-style-type: none"> <li>Excavation associated with foundation work</li> <li>Surplus material and offcuts from: <ul style="list-style-type: none"> <li>Foundation work and floor slab installation</li> <li>Erection of framework and structural walls</li> <li>Installation of roofing and wall coverings</li> <li>Internal fit out of building</li> <li>Connection to new utilities</li> </ul> </li> <li>Landscaping</li> <li>Preparation of warehouse access road and car-parking areas</li> <li>Forming of new kerbs, gutters, medians and other structures</li> <li>Construction of asphalt and concrete pavements</li> </ul> | <p>Post Construction</p> <ul style="list-style-type: none"> <li>Decommissioning/demobilisation of construction sites</li> <li>Landscaping</li> <li>Removal of construction ancillary facility</li> </ul> |

Table 4: Waste generated during construction

| Waste Type        | Classification                        | Estimated Quantity                                                                                 | Reuse/recycling                                            | Disposal                                                                |
|-------------------|---------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------|
| <i>Demolition</i> |                                       |                                                                                                    |                                                            |                                                                         |
| Vegetation        | General Solid Waste (non-putrescible) | Area of vegetation to be removed is yet to be determined, but could be up to 40,000 m <sup>2</sup> | Transferred off-site for re-processing / recycling / reuse | Any element unable to be reused or recycled will require disposal at an |

| Waste Type                                                                                | Classification                        | Estimated Quantity                                                                                                              | Reuse/recycling                                                       | Disposal                                                                                                |
|-------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|                                                                                           |                                       |                                                                                                                                 |                                                                       | appropriately licensed facility                                                                         |
| Concrete / asphalt pavement                                                               | General Solid Waste (non-putrescible) | Area of pavement to be removed is yet to be determined, but could be up to 260,000 m <sup>2</sup>                               | Either re-processed on site or transferred off-site for re-processing | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| Existing structures<br>- Hail mesh structure                                              | General Solid Waste (non-putrescible) | Hail mesh approx. 150,000 m <sup>2</sup> plus support structure                                                                 | Assume sold and reused                                                | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| Existing structures<br>- Existing building                                                | General Solid Waste (non-putrescible) | Building footprint approx. 7,300 m <sup>2</sup>                                                                                 | Transferred off-site for re-processing / recycling / reuse            | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| Existing structures<br>- Wash bays                                                        | General Solid Waste (non-putrescible) | Building footprint approx. 850 m <sup>2</sup>                                                                                   | Transferred off-site for re-processing / recycling / reuse            | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| Existing services<br>- Stormwater                                                         | General Solid Waste (non-putrescible) | Infrastructure to be removed is yet to be determined, but could include culverts, pipes, fittings, geotextiles, pits and grates | Transferred off-site for re-processing / recycling / reuse            | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| Existing services<br>- Water<br>- Sewer<br>- Gas<br>- Electricity<br>- Telecommunications | General Solid Waste (non-putrescible) | Removal of existing infrastructure will be dependent upon the likelihood of upgrade                                             | Transferred off-site for re-processing / recycling / reuse            | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |

| Waste Type                             | Classification                        | Estimated Quantity                                                                                                                                                                                        | Reuse/recycling                                                                               | Disposal                                                                                                         |
|----------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <i>Construction</i>                    |                                       |                                                                                                                                                                                                           |                                                                                               |                                                                                                                  |
| VENM and ENM                           | General Solid Waste (non-putrescible) | Quantities yet to be determined                                                                                                                                                                           | On-site re-use and / or taken off-site for recycling / reuse / re-processing, where relevant. | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility          |
| Contaminated soil                      | To be determined                      | Quantities yet to be determined, if any                                                                                                                                                                   | N/A                                                                                           | Treatment and disposal                                                                                           |
| Concrete                               | General Solid Waste (non-putrescible) | Volume of concrete required at site is yet to be determined, however a quantity of concrete wasted will be minimised through construction management processes                                            | Either re-processed on site or transferred off-site for re-processing                         | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility disposal |
| Asphalt                                | General Solid Waste (non-putrescible) | Volume of concrete required at site is yet to be determined, however a quantity of asphalt wasted will be minimised through construction management processes                                             | Either re-used / re-processed on site or transferred off-site for reuse / re-processing       | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility          |
| Timber and formwork (used and offcuts) | General Solid Waste (non-putrescible) | In-situ concrete yet to be determined, however a quantity of timber and formwork will be wasted. Waste generated will be minimised through construction management processes.                             | Either re-used on site or transferred off-site for reuse / re-processing                      | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility          |
| Bricks / pavers / tiles                | General Solid Waste (non-putrescible) | Quantities of bricks / pavers / tiles yet to be determines, however it is assumed that a proportion will be wasted, through breakage and off-cuts. Waste generated will be minimised through construction | Transferred off-site for re-processing                                                        | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility          |

| Waste Type                                   | Classification                        | Estimated Quantity                                                                                                                                                                                                             | Reuse/recycling                                                                             | Disposal                                                                                                |
|----------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|                                              |                                       | management processes.                                                                                                                                                                                                          |                                                                                             |                                                                                                         |
| Sedimentation controls                       | General Solid Waste (non-putrescible) | Controls are likely to include hay bales and silt fences                                                                                                                                                                       | Transferred off-site for re-processing                                                      | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| Packaging                                    | General Solid Waste (non-putrescible) | Construction management processes will minimise the quantity of packaging waste produced                                                                                                                                       | Packaging waste will be recycled wherever possible                                          | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| General construction waste (non-putrescible) | General Solid Waste (non-putrescible) | Construction management processes will minimise the quantity of general construction waste produced                                                                                                                            | Transferred off-site for re-processing and recycling, wherever possible                     | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| Putrescible office and lunchroom waste       | General Solid Waste (putrescible)     | The project is expected to create 300 construction jobs, however the amount of waste produced by on-site workers will be dependent on phase of construction, how many workers are on site and facilities provided for workers. | N/A                                                                                         | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |
| Non-putrescible office and lunchroom waste   | General Solid Waste (non-putrescible) | The project is expected to create 300 construction jobs, however the amount of waste produced by on-site workers will be dependent on phase of construction, how many workers are on site and facilities provided for workers. | All paper / cardboard and commingled recyclables will be transferred off-site for recycling | Any element unable to be reused or recycled will require disposal at an appropriately licensed facility |

## 4 POTENTIAL IMPACTS

The impacts of the Proposal include construction and operational impacts. Construction impacts relate to the waste streams which could be generated by the demolition and construction processes and operational impacts relate to the management of waste streams that could be produced at the Proposal site when the facility is operational. This Section outlines potential impacts associated with treating, storing, using and disposing of any waste and waste products. These have been separated into impacts associated with treating, storing and using materials on-site, and recycling and disposal, which occurs off-site.

### 4.1 Construction

Table 6 provides a list of impacts associated with potential waste management activities. These are indicative only and subject to requirements set out in the Construction Environmental Management Plan (CEMP) to be issued prior to commencement of construction.

Table 7: Potential impacts associated with on-site and off-site waste management during construction

| On-site Waste Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Off-site Waste Management                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Treatment and/or Reprocessing</p> <ul style="list-style-type: none"> <li>Vegetation will be either re-processed on-site or transferred off-site for reprocessing. Should this occur on-site, it will have an impact on noise sensitive receivers.</li> <li>Concrete and asphalt will be reprocessed on-site or transferred off-site for reprocessing. Should this occur, it would potentially generate dust and have an impact on noise sensitive receivers.</li> </ul>                                                                                                                                                                                                                                                                                                                                                    | <p>Recycling</p> <ul style="list-style-type: none"> <li>Noise associated with recycling activities (particularly with construction and demolition (C&amp;D) waste)</li> <li>Dust caused by recycling activities (particularly with C&amp;D waste)</li> <li>Odour associated with putrescible waste processing</li> <li>Greenhouse gas emitted from recycling activities</li> </ul> |
| <p>Storage</p> <ul style="list-style-type: none"> <li>VENM / ENM will be stored on-site for re-use or prior to removal from site.</li> <li>Should concrete and asphalt be re-processed and re-used for on-site applications, it will be stockpiled on-site. Potential impacts associated with concrete stockpiling include health and safety hazards, dust and impact on visual amenity.</li> <li>Timber, plasterboard, bricks / pavers / tiles, sediment controls, surplus building materials and other C&amp;D wastes will be temporarily stockpiled on site prior to re-use, re-processing and / or off-site disposal. This could result in health and safety issues, dust and could impact visual amenity.</li> <li>If waste is stored incorrectly, it may result in airborne litter and stormwater pollution.</li> </ul> | <p>Disposal</p> <ul style="list-style-type: none"> <li>Greenhouse gas associated with disposal of putrescible waste</li> <li>Dust</li> <li>Consumption of landfill airspace</li> <li>Disposal of potentially valuable natural resources</li> <li>Health and safety risks associated with hazardous waste disposal</li> </ul>                                                       |
| <p>Re-use</p> <ul style="list-style-type: none"> <li>The Contractor may re-use some waste materials on-site. This is not expected to have an impact as it will essentially replace virgin materials.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                    |

## 5 MITIGATION MEASURES

This Section outlines mitigation measures to address the impacts of waste management during the construction and operational phases as described in Section 4. It also outlines the principles which will ensure the Proposal's consistency with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 (see Section 2), such as decreasing waste generation and increasing recycling.

### 5.1 Construction

Measures to mitigate the effect of the construction waste streams would be incorporated into the CEMP (to be issued prior to commencement of construction), including the following:

- Characterisation of construction waste streams
- Management of any identified hazardous waste streams
- Procedures to manage construction waste streams, including handling, storage, classification, quantification, identification and tracking
- Mitigation measures for avoidance and minimisation of waste materials
- Procedures and targets for reuse and recycling of waste materials.

Best-practice waste management principles would be incorporated into the CEMP, such as:

- All waste and recyclable streams shall be stored separately on site
- All storage areas / containers for each waste and recycling stream shall be kept on the site at all times and shall be indicated on the site plans/drawings as part of the CEMP
- Convenient and safe vehicular access to waste and recycling material storage areas shall be provided
- The removal, handling and disposal of asbestos or other hazardous materials shall be carried out in accordance with WorkCover NSW, Office of Environment and Heritage and other regulatory authority guidelines and requirements
- Appropriate signage will be used in the waste storage area to ensure correct separation of recyclables
- Stockpiles will be maintained in accordance with the erosion and sedimentation control plan
- Waste to be stored so as to avoid airborne litter, vermin and stormwater pollution
- Re-processing, recycling and/or removal of waste materials for disposal should be scheduled to limit stockpiling and associated impacts.
- Putrescible materials need to be removed from site as soon as possible to avoid odour impacts. Non-putrescible materials should be reprocessed or removed from site on an 'as-needs' basis to limit logistical, health and safety and dust impacts. Hazardous waste materials, should they arise, must be immediately removed to limit environmental and health and safety risks.
- Waste materials should only be transported to their next destination using a licensed contractor
- Waste materials should only be transported to an appropriately licensed facility for recycling or disposal
- Records to be maintained on all waste exiting the construction site.

Waste avoidance principles that could be incorporated into the CEMP include:

- Avoidance and reuse of material would have priority over recycling
- Recycling would have priority over disposal
- If possible concrete components would be crushed and re-used on-site, with the remainder sent to a recycling facility



- Waste generation would be minimised by ordering the correct quantity of materials
- Selection of materials which maximise recycled content, while having low embodied water and energy use
- Selection of materials which maximise durability and lifespan.
- Selection of reputable waste removal contractors who will guarantee that recyclable material will be recycled and will provide any relevant certificates
- Vegetation removed shall be either preserved for use in the new development, or mulched for inclusion in landscaping activities. The remainder will be sent to a composting facility.
- Excavated earth will be used for infill and landscaping where feasible, the remainder will be sent to a recycling facility
- Asphalt will be re-used by transferring it to a batching plant or using it as a base layer for access roads
- Coordinate and sequence trades people to minimise waste
- Pre-fabricate materials where possible
- Use modular construction to reduce the need for excess waste, where possible or feasible
- Reuse formwork
- Separate off-cuts to facilitate reuse, re-sale or efficient recycling
- Select landscaping which reduces green waste
- Engage with the supply chain to supply products and materials that use minimal packaging
- Set up schemes with suppliers to take back packaging materials.

## 5.2 Operations

Measures to mitigate the effect of waste arising during operation of the facility would be incorporated into the Proposal's environmental policy for operations, within the OEMP. This policy would include measures to encourage recycling behaviour and increase the diversion of waste into recycling streams. These would include requirements such as:

- Addressing waste management requirements and goals in staff inductions
- Providing staff access to documentation outlining the facility's waste management requirements
- Locating recycling bins in kitchen areas beside general waste bins to prevent contamination of recycling
- Positioning paper recycling bins close to printer/photocopying equipment
- Minimising general waste bins at desks but providing adequate container and paper recycling to encourage sorting of recyclables
- Providing adequate bin storage for the expected quantity of waste.

Waste arising from maintenance would be dealt in part by the asset management strategy and the overarching environmental policy which adheres to the waste hierarchy. Where feasible from a safety and cost perspective, assets would be refurbished; if a replacement is required the maintenance contractor would be responsible for ensuring any waste is recycled; if this is not possible arrangements for disposal at an appropriately licenced facility would be made.

Disposal of containers would be provided in the area around the diesel re-fuelling station to dispose of used spills kits. These containers will be taken for disposal at an appropriately licenced facility.

The following mitigation and quality control measures would be incorporated into the OEMP:

- Appropriate areas shall be provided for the storage of waste and recyclable material

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## **APPENDIX F – UNEXPECTED CONTAMINATION FINDS PROTOCOL**



# UNEXPECTED CONTAMINATION FINDS PROTOCOL

SSD-7500 – Construction, fit-out and operation of a warehouse and distribution uses, with ancillary offices  
5 and 9 Culverston Road, Minto

25 JANUARY 2022

## SSD-7500 – Construction, fit-out and operation of a warehouse and distribution uses, with ancillary offices, 5 and Culverston Road, Minto

### Unexpected Contamination Finds Protocol

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**Report No**

MINTO\_CHARTERHALL\_00001

**Date**

25/01/2022

**Revision Text**

B

## REVISIONS

| Revision | Date       | Description                     | Prepared by | Approved by |
|----------|------------|---------------------------------|-------------|-------------|
| A        | 24/01/2022 | Initial draft                   | PR          | JC          |
| B        | 25/01/2022 | Final draft for DPIE submission | PR          | JC          |

## KEY TERMS AND ACRONYMS

| Acronym/Term               | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CEMP                       | Construction Environmental Management Plan                                                                                                                                                                                                                                                                                                                                                                                                    |
| CoC                        | Conditions of Consent as detailed in the EP&A Act Development Consent SSD 7099                                                                                                                                                                                                                                                                                                                                                                |
| Contractor's CM            | Contractor's Construction Manager                                                                                                                                                                                                                                                                                                                                                                                                             |
| Contractor's PM            | Contractor's Project Manager                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Council                    | Liverpool City Council                                                                                                                                                                                                                                                                                                                                                                                                                        |
| DPIE                       | Department of Planning, Industry and Environment                                                                                                                                                                                                                                                                                                                                                                                              |
| EIS                        | Environmental Impact Statement                                                                                                                                                                                                                                                                                                                                                                                                                |
| EMS                        | Environmental Management Systems                                                                                                                                                                                                                                                                                                                                                                                                              |
| ENM                        | Excavated Natural Material (ENM) is naturally occurring rock and soil (including materials such as sandstone, shale, clay and soil) that has: a) Been excavated from the ground b) Contains at least 98 per cent (by weight) natural material c) Does not meet the definition of Virgin Excavated Natural Material (VENM).                                                                                                                    |
| Environmental Emergency    | Any event that causes or has the potential to cause material harm to the environment. An environmental emergency is a Class 3 incident.                                                                                                                                                                                                                                                                                                       |
| Environmental Incident     | An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. Environmental incidents include pollution incidents and environmental emergencies. Environmental incidents may arise from natural (e.g. storm, wind or bushfire) or human factors.                                                                                                               |
| EPA Act                    | <i>Environmental Planning and Assessment Act 1979</i>                                                                                                                                                                                                                                                                                                                                                                                         |
| EPA                        | Environment Protection Authority                                                                                                                                                                                                                                                                                                                                                                                                              |
| ER                         | Environmental Representative                                                                                                                                                                                                                                                                                                                                                                                                                  |
| ESCP                       | Erosion and Sediment Control Plans                                                                                                                                                                                                                                                                                                                                                                                                            |
| Material harm              | Harm that involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment) |
| Non-compliance             | An occurrence, set of circumstances, or development that results in a non-compliance or is non-compliant with Development                                                                                                                                                                                                                                                                                                                     |
| Non-conformance            | Observations or actions that are not in strict accordance with the CEMP and the aspect specific sub-plan.                                                                                                                                                                                                                                                                                                                                     |
| PIRMP                      | Pollution Incident Response Management Plan                                                                                                                                                                                                                                                                                                                                                                                                   |
| Principal's Representative | The Project Management Team and Environmental Specialists                                                                                                                                                                                                                                                                                                                                                                                     |



## UNEXPECTED CONTAMINATION FINDS PROTOCOL

| Acronym/Term                     | Meaning                                                                                                                                                                                                                                |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project ('the')                  | The SSD-7500 for warehouse and distribution uses at 5 and 9 Culverston Road, Minto                                                                                                                                                     |
| Project site / Project footprint | The subject of the SSD-7500 for warehouse and distribution uses at 5 and 9 Culverston Road, Minto                                                                                                                                      |
| RtS                              | Response to Submissions                                                                                                                                                                                                                |
| SSD                              | State significant development                                                                                                                                                                                                          |
| VENM                             | Virgin Excavated Natural Material (VENM) has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities |

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## 1 INTRODUCTION

On 23 June 2017, a State Significant Development ('SSD') Application was approved by the Minister for Planning under delegation for construction, fit-out and operation of a warehouse and logistics hub including four warehouse buildings for warehousing and distribution uses, with ancillary offices. This approval was subsequently modified on 16 December 2021 to change the layout staging and the warehouse size for three of the four warehouses. The modification was sought in response to market research and discussions with prospective tenants.

The construction of the warehouses will be delivered in stages, with ancillary car parking to be delivered with each stage.

This Unexpected Contamination Finds Protocol is specifically developed for the construction of Stages 1 and 2 of the approved development, including associated warehousing, office space, external storage and carparking.

### 1.1 Unexpected Contamination Finds Protocol Purpose and Context

As a condition of development consent for SSD-7500, A Construction Environmental Management Plan (CEMP) is to be developed (CoC C1) to support the construction of the warehouse and logistics hub. A number of sub-plans are to be developed to support the overarching CEMP, including an Unexpected Contamination Finds Protocol (CoC B38 and C2(e)).

The site was previously used for industrial purposes comprising the storage and processing of motor vehicles and associated activities. A Phase 1 and Limited Phase 2 Environmental Site Assessment, completed to support the Environmental Impact Statement (EIS) for the SSD Application in 2016, found limited and restricted contamination onsite within the boundaries of Stage 3 of the approved development. A Remediation Action Plan (RAP) was developed for the site in late 2016 in response to submissions received on the original SSD application. The RAP identified that remediation should be conducted, specifically of the former Aboveground Storage Tank (AST) and associated petroleum infrastructure and hydrocarbon impacted soils located in the location of Stage 3 of the development.

The Remediation Action Plan also identified the potential for contamination to exist more broadly across the site. An Unexpected Contamination Finds Protocol was developed as part of the RAP to support construction activities, should contamination be found in areas outside of Stage 3 of the development.

### 1.2 Project Description

The site is approximately 29.36ha comprising regular allotments of land bound on four sides by Rose Payten Drive (South), Airds Road (West and North) and the Main Southern Railway (East). The site is also partially divided into Eastern and Western sections with a road running South from Airds Road through its centre, Culverston Road.

The proposal consists of two industrial facilities of varying sizes along the Western side with the Eastern side being proposed as external storage. The site layout addresses the necessity for a visually appealing streetscape, building form and orientation whilst also allowing for rational access and operational functionality for the intended users. This creates a compatible proposal that responds to the existing industrial context and supports a positive interaction with the streetscape. The promotion of safety and a high level of functionality and amenity are also key considerations in the proposal.

Within the site, building layouts address the main street frontages including Rose Payten Drive, Airds Road, and Culverston Road and conceal loading areas within the site where possible. As an additional measure, landscape buffers have also been introduced to improve visual amenity.

The proposal will retain the use of the site for employment-generating purposes by facilitating the operation of the site for the storage and distribution of freight. Accordingly, the proposal will create employment opportunities and service businesses that operate on a local and national scale.

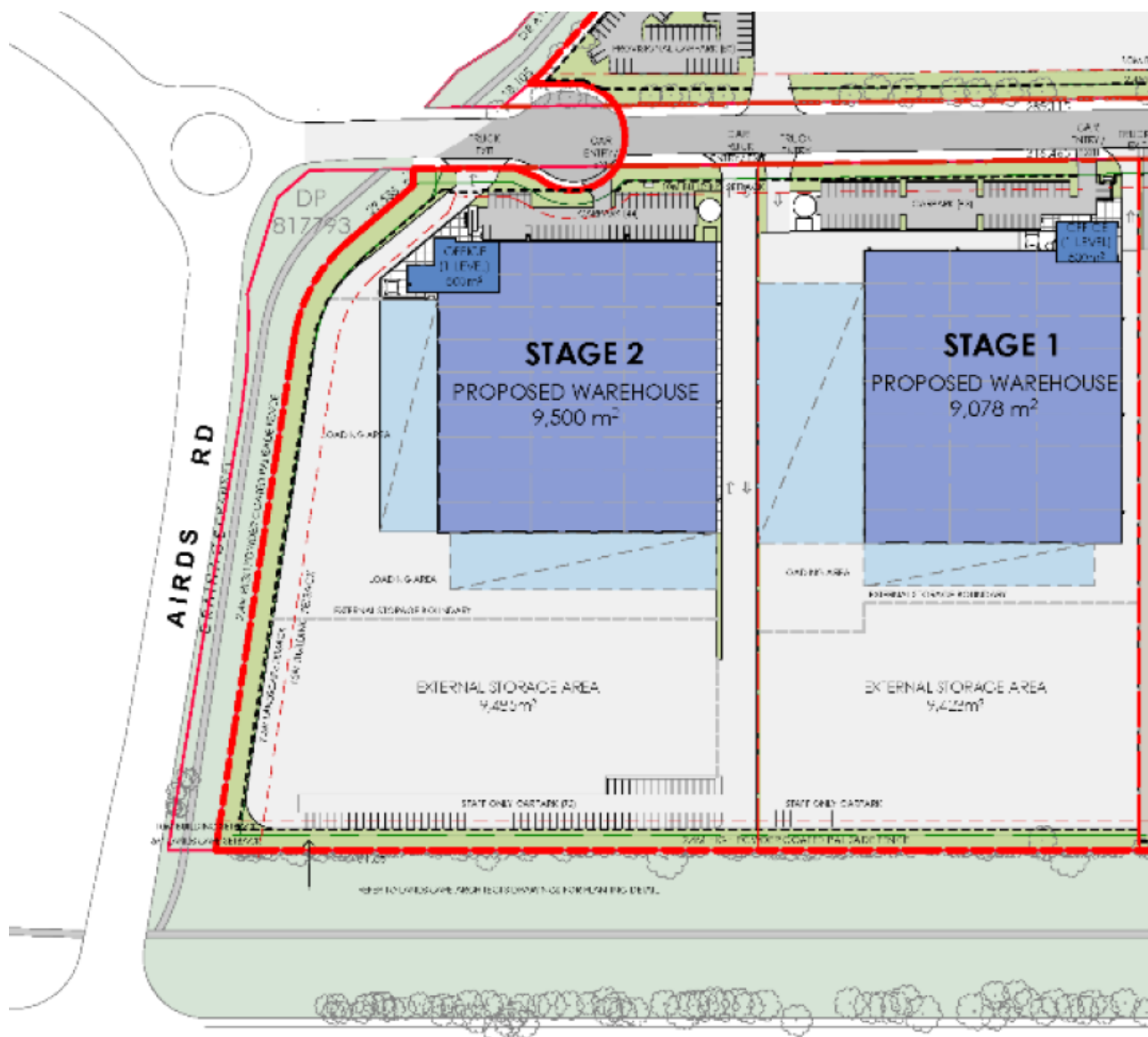


Figure 1-1 Project Overview

## 1.2.1 Construction Activities

Construction of the Project is anticipated to be approximately 10 months. Construction works have been divided into delivery phases, specifically:

- Site Preparation
- Demolition and Bulk Earthworks
- Warehouse, External Storage and Carparking Construction

### 1.2.1.1 Site Preparation

A summary of the Site Preparation activities includes, but are not limited to:

- Site surveying including, but not limited to, the installation of survey equipment such as survey controls, repeater stations, environmental monitoring equipment and construction monitoring equipment
- Property acquisition adjustments including installation of property fencing, and relocation and adjustments of utilities to property including water supply and electricity

## UNEXPECTED CONTAMINATION FINDS PROTOCOL

- Relocation and connection of utilities
- Establishment of site buildings and structures including erosion and sediment controls
- Establishment of exclusion zones
- Installation of temporary construction compounds, including amenities and office for bulk earthworks.

### 1.2.1.2 Demolition and Bulk Earthworks

Demolition, bulk earthworks, drainage and utility activities include, but not limited to:

- Demolition of existing buildings and structures, including offsite disposal of demolition waste
- Establishment of temporary stockpiling pads and associated temporary access roads
- Establishment of temporary batch plant sites and installation of batch plant if required
- Importation, stockpiling and placement of clean fill (bulk earthworks) and raising of the Project site to final level
- Importation, placement and compaction of engineered fill, which is comprised of virgin excavated natural material (VENM), excavated natural material (ENM) or other material approved in writing by the NSW Environment Protection Authority (EPA)
- Importation of construction materials
- Installation of erosion and sediment controls
- Installation of on-site detention basins
- Drainage and utilities installation.

### 1.2.1.3 Warehousing, External Storage and Carparking Construction

Warehousing activities include, but not limited to:

#### **Construction and fit-out of warehousing**

- Establishment of construction compound, temporary fencing/ hoardings and temporary sediment and erosion control
- Installation of temporary site offices and amenities
- Excavation, foundation and floor slab installation
- Erection of framework and structural walls, including use of cranes
- Installation of roof, including use of cranes
- Internal fit out
- Landscaping
- Preparation of warehouse access road subgrade
- Forming of new kerbs, gutters, medians and other structures
- Placement of asphalt and concrete pavement
- New line marking, lighting and sign posting
- Removal of construction traffic management and opening of the internal road and warehouse access roads to traffic.

#### **Miscellaneous structural construction and finishing works**

- Decommissioning/demobilisation of the construction area
- Commissioning of operational facilities

## UNEXPECTED CONTAMINATION FINDS PROTOCOL

- Landscaping
- Rehabilitation of affected areas
- Post-construction condition surveys
- Post-construction site survey
- Removal of construction environmental controls
- Removal of construction ancillary facility related traffic signage
- Removal of construction traffic management and opening of new works to traffic.

### 1.2.2 Construction Hours

In accordance with CoC B18, construction works will generally be undertaken during standard daytime construction working hours, being:

- 7:00 am to 6:00 pm Monday to Friday
- 8:00 am to 1:00 pm Saturday
- No works on Sunday or public holidays.

Construction outside of the hours nominated above may be undertaken in the following circumstances (CoC):

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



## 2 PLANNING AND MANAGEMENT FRAMEWORK

### 2.1 Legislative Requirements

While this protocol relates to unconfirmed contamination within the development site, there are a number of legislative requirements regarding the management of contaminated land. These are outlined in the following sections.

#### 2.1.1 Contaminated Land Management Act 1997

In NSW, the management of contaminated land is shared by the NSW EPA, the NSW Department of Planning, Industry and Environment (DPIE) and planning consent authorities (usually local councils). Under the Contaminated Land Management Act (CLM Act) 1997, the NSW EPA regulates contaminated sites where the contamination is Significant Enough to Warrant Regulation (SEWR). Contaminated sites that are not regulated by the NSW EPA are managed by local councils through land use planning processes (such as change of land use, or some remediation works). The NSW EPA also administers the NSW Site Auditor scheme under Part 4 of the CLM Act. The NSW EPA accredits individuals under the Act as Site Auditors to provide independent review of work conducted by contaminated site consultants.

##### 2.1.1.1 Guidelines under the CLM Act

Section 105 of the CLM Act allows the EPA to make or approve guidelines connected with the objectives of the CLM Act. These guidelines must be taken into consideration by the EPA and by accredited site auditors when conducting a site audit.

The current list of guidelines made or approved by the EPA under the CLM Act are available on the NSW EPA <http://www.epa.nsw.gov.au/clm/guidelines.htm>.

The NSW EPA approved guidelines include the national guidance on the assessment of contaminant concentrations on sites, presented in the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 2013), herein referred to as the ASC NEPM (NEPC, 2013). The ASC NEPM (NEPC, 2013) present generic Tier 1 trigger values for contaminant concentrations in both soil and groundwater. These are derived based on exposure settings for particular land uses such as low and high density residential; recreational/open space; and commercial / industrial land uses. As the site is to be developed for commercial / industrial purposes it is considered appropriate to compare the results of soil analysis against the investigation levels for commercial / industrial land.

#### 2.1.2 Environmental Planning and Assessment Act 1979

The developed has been approved as a State Significant Development (SSD) under Section 89E of the Environmental Planning and Assessment Act (EPA Act) 1979. Notwithstanding the approval mechanism under the EPA Act, a number of State Environmental Planning Policies (SEPPs) may apply to this development, including SEPP 55 – Remediation of Land.

##### 2.1.2.1 SEPP 55 – Remediation of Land

The State Environmental Planning Policy No. 55 (SEPP 55) – Remediation of Land under the Environmental Planning and Assessment Act (EP&A Act) 1979 provides a state-wide planning approach for the remediation of contaminated land. In particular, SEPP 55 provides for Category 1 and Category 2 remediation. Projects classified as Category 1 require development consent. It is noted that this developed has already obtained consent as SSD.

#### 2.1.3 Protection of the Environment Operations Act 1997

The Protection of the Environment Operations Act 1997 (NSW) (POEO Act) is the key piece of environment protection legislation administered by the NSW EPA.

## UNEXPECTED CONTAMINATION FINDS PROTOCOL

The POEO Act provides a single integrated licensing arrangement to control the air, noise, water and waste impacts of an activity. The NSW EPA is the regulatory authority for the licensing of activities specified under Schedule 1 of the POEO Act (scheduled activities) and in most cases councils are the regulatory authority for non-scheduled activities. Licences can also be issued to regulate water pollution from activities that are not in Schedule 1. Such licences can provide protection against prosecution for water pollution if the licence conditions are complied with.

The POEO Act also provides the key mechanisms (including clean-up, prevention and prohibition notices) for protecting the environment. It also provides the regulatory regime for waste management under the Protection of the Environment Operations (Waste) Regulation 2005 (Waste Regulation).

All remediation works completed at the site will be conducted in compliance with the relevant requirements of the POEO Act.

### 2.1.3.1 Protection of the Environment Operations (Waste) Regulation 2005

The following outlines the required documentation and approvals required for the handling, off site transport and disposal of waste during the remediation works in accordance with the Protection of the Environment Operations (POEO) (Waste) Regulation 2005 and the POEO Act 1997.

The POEO Act defines waste as:

- a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or
- b) any discarded, rejected, unwanted, surplus or abandoned substance, or
- c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or
- d) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or
- e) any substance prescribed by the regulations to be waste.

A substance is not precluded from being waste for the purposes of this Act merely because it is or may be processed, recycled, re-used or recovered.

### 2.1.3.2 Waste Classification

Wastes will need to be characterised in accordance with the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, 2014a). The following characteristics of the waste must also be determined:

- The form of the waste (the physical state e.g. solid);
- The waste code;
- The waste description; and
- The Dangerous Goods properties (if applicable).

Waste classification is a six-step process, which includes answering the following questions:

1. Is the waste special waste? – This includes determining if the waste is asbestos waste, which are defined as “Any waste that contains asbestos,”
2. Is the waste liquid waste?
3. Is the waste pre-classified? – This includes waste gazetted<sup>1</sup> by the NSW EPA in particular pre-classifications, such as building and demolition waste, and virgin excavated natural materials.
4. Does the waste possess hazardous characteristics? – Which stipulates a waste must be classified ‘hazardous waste’ if it is a dangerous good under the Transport of Dangerous Goods Code.
5. Determine a waste classification using chemical assessment.
6. Is the waste putrescible or non-putrescible?

If an immobilisation approval applies to a waste, a generator who complies with the terms of that approval may classify the waste as set out in the approval, rather than the Waste Classification Guidelines (NSW EPA, 2014a).

## UNEXPECTED CONTAMINATION FINDS PROTOCOL

Where it can be demonstrated that a specific type of waste can safely be used for another purpose, rather than being disposed of in accordance with the waste regulations, the NSW EPA may grant permission for that waste to be used for the specific purpose, subject to strict conditions. In these cases, the NSW EPA will issue a resource recovery order and resource recovery exemption. These are to be considered within the waste classification process.

### 2.1.3.3 Waste Transport Requirements

Under Schedule 1, Part 2 of the POEO Act 1997 the transport of several classifications of waste in loads exceeding 200 kilograms is declared to be a scheduled activity for which a licence is required. As such the proposed transport of the selected wastes from the site to off-site disposal facilities will require the use of licensed transporters.

Under the POEO (Waste) Regulations 2014 the proximity principle was introduced which makes it an offence to transport waste generated in NSW by motor vehicle for disposal more than 150 kilometres from the place of generation, unless the waste is transported to one of the two nearest lawful disposal facilities to the place of generation.

### 2.1.3.4 Waste Tracking Requirements

The POEO (Waste) Regulation 2005 specifies requirements for the tracking of waste both within NSW and interstate. The wastes that must be tracked are listed in the Schedule 1 of the Regulation (this Schedule includes soil contaminated with waste oil/ water, hydrocarbons/ water mixtures or emulsions).

A NSW EPA on line tracking system is available to track waste that is transported within NSW or into NSW from other states or territories.

### 2.1.3.5 Waste Disposal Facilities Licences

Before wastes are transported from the site, it is necessary to confirm that the facility (e.g. landfill/ recycling facility) where the waste is being transported to is legally able to accept the waste. These include facilities licenced to receive and process soils.

### 2.1.3.6 Waste Records

If not using an approved online tracking system, records must be maintained of the waste transport certificates for at least four years. The use of the NSW EPA online tracking system removes the requirement to maintain these records.

## 2.1.4 Work Health and Safety Act 2011

The Work Health and Safety Act 2011 (NSW) (WHS Act) is the key piece of work safety legislation administered by SafeWork NSW and provides the regulatory mechanism for the management of asbestos within NSW. Those specific to the remediation works include, but are not limited to:

- Work Health and Safety Act & Regulation 2011.
- NSW WorkCover Code of Practice – Work Health and Safety, Consultation, Co-operation and Coordination, 2011
- AS 1715 - 2009 Selection use and maintenance of respiratory protective devices;
- AS 1716 - 2012 respiratory protective devices;
- AS/NZS 2161.1:2000 Occupational protective gloves - Selection, use and maintenance.
- AS/NZS 2161.2:2005 Occupational protective gloves - General requirements
- Department of Environment, Climate Change and Waste Classification Guidelines Part 1: Classifying Waste (NSW EPA, 2014a).

## 2.2 Development Approval

The Project has been approved under the EPA Act. There are conditions relevant to this Unexpected Contamination Finds Protocol in the Development Consent for the project (State Significant Development 7500). These are shown in Table 2-1 SSD7500 Development Consent – Unexpected Contamination Finds Protocol relevant conditions Table 2-1 below.

Table 2-1 SSD7500 Development Consent – Unexpected Contamination Finds Protocol relevant conditions

| CoC | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | UCFP Section                               |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| B27 | Prior to the commencement of any demolition or construction works which impact the Endeavour Energy electricity network, the Applicant must implement the Unexpected Contamination Finds Protocol required by Condition B38 to identify and dispose of asbestos or asbestos containing material.                                                                                                                                                                                                                                                                   | This document, including Section 3.2       |
| B33 | The remediation works at the site must be carried out by suitably qualified and experienced consultant(s) that have been engaged by the Applicant.                                                                                                                                                                                                                                                                                                                                                                                                                 | Section 3.2                                |
| B35 | During construction of the development, the Applicant must ensure that no contaminated groundwater encountered on the site can discharge into waters including Bow Bowing Canal or any other off-site location or waterway that could cause pollution of waters.                                                                                                                                                                                                                                                                                                   | Section 3.2                                |
| B36 | Upon completion of the remediation works, the Applicant must submit to the Secretary, a Site Audit Report and a Site Audit Statement Part A for the relevant part of the Site, prepared by an accredited NSW EPA Site Auditor, which demonstrates that the site is suitable for its intended commercial/ industrial land use.                                                                                                                                                                                                                                      | Sections 4.3.1, 4.5.1                      |
| B37 | All excavated material including contaminated groundwater must be classified, handled, transported and disposed of in accordance with the <i>Protection of the Environment Operations Act 1997</i> and the <i>Protection of the Environment Operations (Waste) Regulation 2014</i> .                                                                                                                                                                                                                                                                               | Section 3.2                                |
| B38 | The Applicant must implement an Unexpected Contamination Finds Protocol that is included in the endorsed Remedial Action Plan to ensure that contaminated or potentially contaminated material encountered during construction works is appropriately managed. The Applicant shall ensure any material identified as contaminated shall be disposed off-site, with the disposal location and results of testing submitted to Council, prior to its removal from the site.                                                                                          | This document, including Section 3.2       |
| C2  | As part of the CEMP required under Condition C1 of this consent, the Applicant must append the following sub-management plans:<br>(a) Construction Traffic Management Plan (see Condition B1);<br>(b) Stormwater Management Plan (see Condition B11);<br>(c) Flood Response and Evacuation Plan (see Condition B13);<br>(d) Waste Management Plan (see Condition B30);<br><b>(e) Unexpected Contamination Finds Protocol (see Condition B38);</b><br>(f) Landscape Management Plan (see Condition B44); and<br>(g) community consultation and complaints handling. | This document                              |
| C3  | The approved CEMP (as revised and approved by the Secretary from time to time) must be implemented by the Applicant for the duration of the construction works.                                                                                                                                                                                                                                                                                                                                                                                                    | Section 1 (Stages 1 and 2 of construction) |
| C7  | The Applicant must ensure that the environmental management plans and sub-management plans required under conditions C1, C2 and C4 of this consent are prepared by a suitably qualified person or persons in accordance with best practice and include:<br>(a) detailed baseline data;<br>(b) a description of:<br>i. the relevant statutory requirements (including any relevant approval, licence or lease conditions);<br>ii. any relevant limits or performance measures/criteria; and                                                                         | This document                              |

| CoC | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | UCFP Section |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|     | <ul style="list-style-type: none"> <li>iii. the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the Development or any management measures;</li> <li>(c) a description of the management measures that would be implemented to comply with the relevant statutory requirements, limits or performance measures/criteria;</li> <li>(d) a program to monitor and report on the: <ul style="list-style-type: none"> <li>i. impacts and environmental performance of the Development; and</li> <li>ii. effectiveness of any management measures (see (c) above);</li> </ul> </li> <li>(e) a contingency plan to manage any unpredicted impacts and their consequences;</li> <li>(f) a program to investigate and implement ways to improve the environmental performance of the Development over time;</li> <li>(g) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>i. incidents;</li> <li>ii. complaints;</li> <li>iii. non-compliances with statutory requirements; and</li> <li>iv. exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul> </li> <li>(h) a protocol for periodic review of the plan.</li> </ul> |              |
| C9  | The Applicant must notify the Secretary and any other relevant agencies of any incident or potential incident with actual or potential significant off-site impacts on people or the biophysical environment associated with the Development immediately after the Applicant becomes aware of the incident.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Section 2.5  |
| C10 | Within seven days of the date of this incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident and any such further reports which may be requested by the Secretary.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Section 2.5  |

## 2.3 Roles and Environmental Responsibilities

The implementation of the Unexpected Contamination Finds Protocol will be conducted by the Construction Contractor during the course of construction. The Construction Project Manager will be accountable for ensuring construction staff, including sub-contractors, are aware of the protocol and the requirement to stop work and report any unexpected finds to their supervisor.

## 2.4 Environmental Training and Competence

Requirements of construction staff under this protocol will be delivered during the project induction, as outlined in the CEMP. Potential contaminants of concern including ways of identifying these materials, stop work protocols and reporting obligations will form part of the induction program and this protocol will be distributed to relevant construction work groups prior to the commencement of their work onsite. A copy of the protocol will also be posted in common places for construction staff, e.g. noticeboards, group sign-in boards.

Where appropriate, the potential for unexpected contamination finds will be raised and discussed in project toolbox talks.

A record of inductions and information discussed in toolbox talks will be recorded and filed in accordance with the CEMP.

## 2.5 Emergency Preparedness and Response

An environmental incident is any event that causes, or has the potential to cause, material harm to the environment. In the event that an unexpected contamination leads to, or has the potential to lead to, material environmental harm, the required pollution incident response process is to be followed. This is outlined in the CEMP, including requirements to contain any pollution and report this to the relevant authorities.



## UNEXPECTED CONTAMINATION FINDS PROTOCOL

In accordance with the POEO Act, an incident of this type must be notified to the EPA, as well as other relevant pollution response agencies, immediately. In accordance with CoC C9, the Secretary of DPIE must also be notified of any incident or potential incident with actual or potential significant off-site impacts on people or the biophysical environment immediately after the Applicant becomes aware of the incident.



### 3 IMPLEMENTATION

This section addresses the key contamination risks that may potentially be encountered onsite and the protocol to address any unexpected contamination finds.

#### 3.1 Potential Contaminants

Broadly, unexpected contamination can be found in various forms. These include:

- Buried or covered building materials, including bonded or friable asbestos
- Buried waste materials, including contaminated solid (municipal, commercial or industrial waste) or liquid waste (hydrocarbons, chemicals)
- Underground storage tanks containing fuel, oil, chemicals or wastewater
- Discoloured or odorous soils or groundwater

Figures Figure 3-1, Figure 3-2 and Figure 3-3 below provide examples of visible signs of contamination in soil or groundwater.



*Figure 3-1 Buried Asbestos example*





*Figure 3-2 Oil Seepage example*



*Figure 3-3 Buried Waste example*

## UNEXPECTED CONTAMINATION FINDS PROTOCOL

As well as visual signs of contamination, there are also olfactory or odour-related signs that contamination may be present onsite. The following odours may be an indication that soil or water contamination exists in the area:

- Fuel or oil odours where there is no known fuel or oil storage
- Chemical odours, particularly those described as unnatural
- Rotten egg odour (hydrogen sulfide)
- Gas odour (methane or LNG with odourised additive)

Based on the previous industrial site use, and as considered in the endorsed Remediation Action Plan, the potential contaminants of concern on the site are:

- Total Recoverable Hydrocarbons (TRH) and Total Petroleum Hydrocarbons (TPH);
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX);
- Lead;
- Polycyclic Aromatic Hydrocarbons (PAHs); and
- Phenols

These contaminants are typically associated with vehicle maintenance and storage activities, as well as fuel storage. These contaminants have the potential to exist in both soil and water, including surface water and groundwater. For volatile contaminants such as BTEX and Naphthalene, these can also be emitted to air.

While site investigations found that assessed contaminants were largely below relevant NEPM criteria for the site use, with the exception of a limited area within Stage 3 of the approved development, there remains the possibility of contamination elsewhere across site that may require remediation.

### 3.2 Protocol

It is possible that workers may unexpectedly encounter unexpected contaminated materials. The adverse which may warrant additional assessment include;

- highly malodours soils or seepage water (e.g. strong residual petroleum odours);
- hydrocarbon sheen on surface water;
- discoloured chemical deposits or soil staining with chemical waste other than of a minor nature;
- large monolithic deposits of materials (e.g. gypsum as powder, or plaster board);
- presence of putrescible refuse including material that may generate hazardous levels of ground gases (e.g. methane) such as large quantities of green waste or timber waste; and
- presence of objects which may indicate the presence of chemical contamination, such as drums, tanks or other such storage items.

The immediate response should be on preventing the disturbance of material, while protecting workers in the immediate area and any surrounding receptors from potential exposure. The procedure shown in Figure 3-4 below should be followed if unexpected contaminated materials are encountered.

## UNEXPECTED CONTAMINATION FINDS PROTOCOL

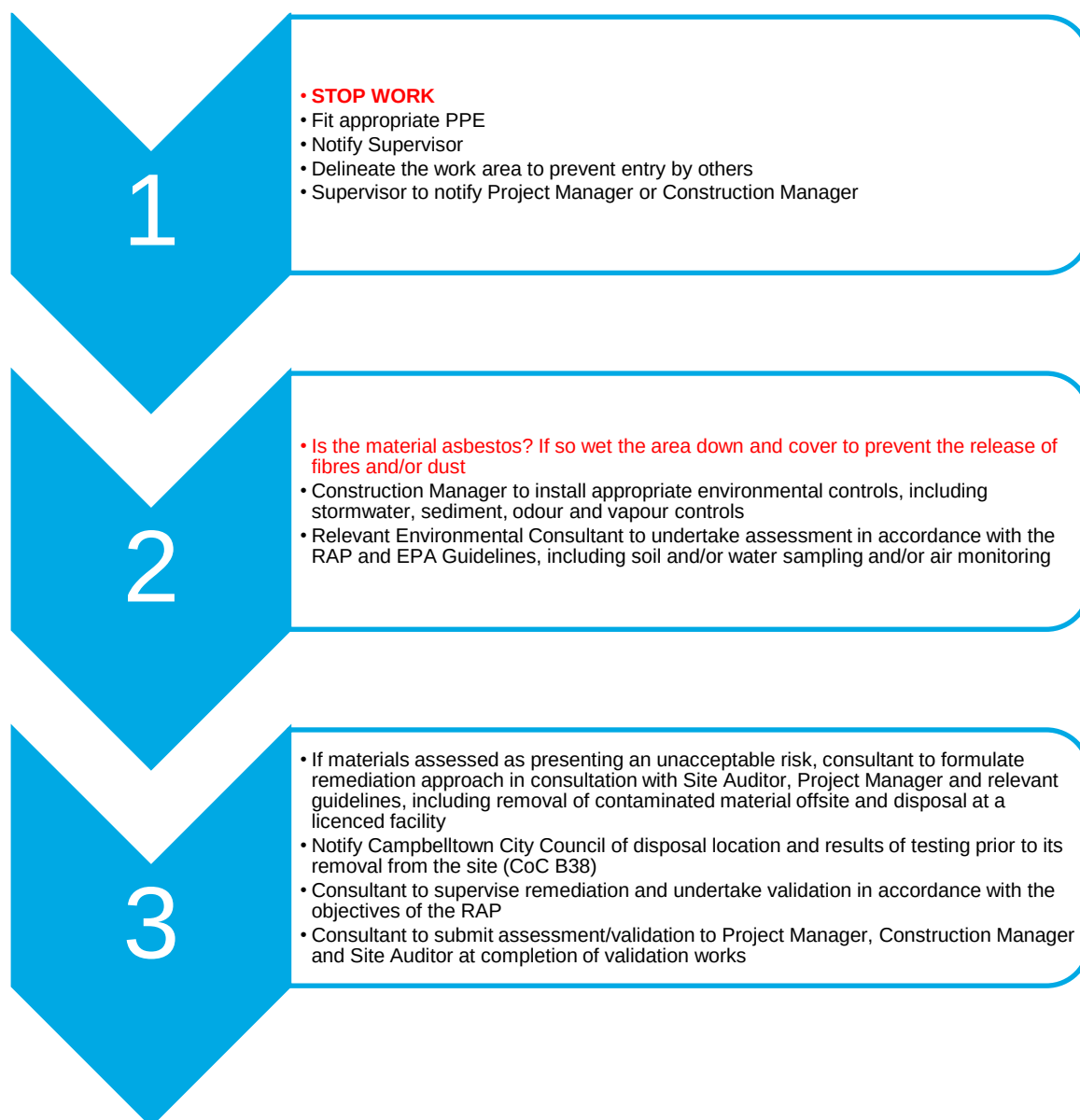


Figure 3-4 Unexpected Contamination Find Protocol

## 4 MONITOR AND REVIEW

### 4.1 Environmental Monitoring

Any soil, water or air monitoring associated with an unexpected contamination find will be conducted by the relevant environmental consultant. It will be the accountability of the consultant to ensure that the relevant monitoring or sampling equipment is calibrated and maintained to a standard which does not affect the integrity of the sample. The Project Manager or Construction Manager will also ensure that the relevant environmental consultant is suitably experienced in assessment of contaminated sites.

### 4.2 Observations and Inspections

It is expected that any unexpected contamination would be found during the course of construction work, particularly work that disturbs the ground surface. However, routine management observations will assist in detecting any contamination that may not have previously been identified. This can happen during weekly environmental site inspections identified as part of the CEMP, or routine inspections of the site conducted by the Construction Manager or their direct reports.

### 4.3 Environmental Auditing

#### 4.3.1 External Audits

If unexpected contamination is identified during the construction of the project, the nominated Site Auditor will be engaged to audit the remediation of the contamination. It will be necessary for a Site Audit Report to be produced, including the remediation and validation of the identified contamination. Where necessary, a Site Audit Statement is to be generated by the Site Auditor prior to occupation for warehousing and logistics.

#### 4.3.2 Internal Audits

Internal audits will be undertaken by the Principal's representative of the Construction Contractor at least 3-monthly. This will ensure that the Construction Contractor is undertaking works in compliance with the development consent and other statutory requirements. This includes conditions of consent and relevant management plans, including this Unexpected Contamination Finds Protocol.

### 4.4 Non-compliance and Actions

#### 4.4.1 Non-compliances

Any non-compliance with the CoC, including those that relate to this Unexpected Contamination Finds Protocol, shall be investigated to determine the root cause and any corrective and/or preventative actions arising. This will be reported to the Principal's Representative in a Non-Conformance/NCR and any corrective and/or preventative actions will be recorded within the Project Corrective Actions Register to be developed by the Construction Contractor and handled in accordance with the Environmental Management System – Improvement Notice (EHS – 9.16) and Non-conformance Register (EHS – 1.1.05).

Any statutory non-compliance, for example a breach of the relevant contamination sites regulations or planning policy, this will be reported to the relevant regulatory, i.e. the NSW EPA or DPIE.

#### 4.4.2 Corrective and Preventative Actions Register

Corrective and preventative actions will be logged into a register which will be used to verify the close out of an NCR. Additionally, the register will also be used to identify opportunities for improvement.

The nominated timeframes to resolve corrective actions are detailed in Table 4-1.

## UNEXPECTED CONTAMINATION FINDS PROTOCOL

Table 4-1 Corrective Actions Timeframe for Resolution

| Risk Ranking | Timeframe                                                     |
|--------------|---------------------------------------------------------------|
| 1            | Action needs to be commenced immediately to resolve the issue |
| 2            | Action needs to be resolved within 1 week                     |
| 3            | Action needs to be resolved within 1 month                    |

Trends relating to environmental incidents or non-compliance findings will be reviewed at the Construction Contractor's Management Team meetings to identify any recurring or systemic issues that are indicative of the need to take preventative action.

### 4.5 Management Review

The Contractor's Management Team and Principal's Representative will review the adequacy of all CEMP provisions, including this protocol, as well as the effectiveness of their implementation to determine whether they are still applicable to the activities being carried out on site.

The management review will be minuted. Any changes to the plan will be made by the Principal's Representative and submitted for approval to DPIE.

#### 4.5.1 Compliance Reporting

As noted in Section 4.3.1, a Site Audit Statement (SAS) is to be prepared by the Site Auditor for the remediation of contamination on the project site. This would include any unexpected contamination identified during the construction phase and the remediation of this contamination. Under CoC B36, this SAS is to be submitted to the Secretary of the DPIE to state that the site is suitable for commercial/industrial occupation.



## REFERENCES

Compliance with relevant legislation and industry best practice is often achieved through the adherence to relevant guidelines and standards. Guidelines and standards used during the compilation of the UCFP include those detailed below.

Where updated or revised versions of guidelines, protocols, Standards or policies, or a replacement of them are available, the most recent versions should be applicable to this Plan.

### Standards

- AS/NZS ISO 14001 - Environmental Management Systems

### Guidelines

- Compliance Reporting Post Approval Requirements (Department 2018)
- Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (OEH, 2011);
- Guideline for the Preparation of Environmental Management Plans (DIPNR 2004)
- NEPM Guidelines for the Assessment of Site Contamination and Amendments
- NSW EPA Contaminated Sites, Sampling Design Guidelines (1995)
- NSW Contaminated Land Management - Guidelines for the NSW Site Auditor Scheme 2017
- State Environmental Planning Policy No. 55 – Remediation of Land
- Waste Classification Guidelines Part 1: Classifying waste (NSW EPA 2014) and Addendum to Part 1 (2016)

**APPENDIX G – LANDSCAPE MANAGEMENT PLAN**



# GROUND iNK

LANDSCAPE ARCHITECTS

## MINTO INDUSTRIAL DEVELOPMENT

5-9 CULVERSTON ROAD, MINTO, NSW

# OPERATIONAL LANDSCAPE MANAGEMENT PLAN

### DOCUMENT STATUS

| ISSUE | DESCRIPTION  | SIGNATURE | DATE       |
|-------|--------------|-----------|------------|
| REV.A | FOR APPROVAL | ML        | 12.01.2022 |
| REV.B | FOR APPROVAL | ML        | 31.01.2022 |



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2. OPERATIONAL LANDSCAPE PLAN..... PAGE 4

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4. MAINTENANCE OF ENVIRONMENTAL FACTORS..... PAGE 9

This Operational Landscape Management Plan to manage the revegetation and landscaping for the proposed industrial development site at 5-9 Culverston Road, Minto has been prepared to meet the requirements of the DPIE Environmental Performance & Management Conditions

The DPIE conditions requires that the Client submit a revised LMP that addresses the following requirements as per Condition B44 Landscaping & Vegetation Management:

Prior to the commencement of construction, the Applicant must prepare a Landscape Management Plan (LMP) to manage the revegetation and landscaping works on-site, to the satisfaction of the Secretary. The plan shall form part of the CEMP required by Condition C2 and be prepared in accordance with Condition C7. The LMP shall:

- a) detail the species to be planted on-site;
- b) demonstrate the landscape plans have been revised to ensure the perimeter fence line of the Development is set back a minimum of 3 metres from the property boundary of the site and is consistent with plan Site Masterplan (Overall), issue 9, prepared by Reid Campbell, dated 24/02/2017;
- c) ensure any plantings in the vicinity of Endeavour Energy electricity easements do not exceed a mature height of 3 metres;
- d) describe the monitoring and maintenance measures to manage revegetation and landscaping works; and
- e) be consistent with the Applicant's Management and Mitigation Measures in this Development Consent.

## Background

The project is located in Minto, NSW and involves the development of warehouse and distribution uses at 5-9 Culverston Road. This Operational Landscape Management Plan relates to the ongoing Operation and Management of the associated revegetation and landscaping for the industrial site following construction. The plan sets out to highlight the tasks required, who is responsible and what are the timeframes that the management service is working to. Furthermore, although the Landscape Management Plan & Landscape Documentation are consistent, they should be read in conjunction with the Charter Hall Landscape Specification.

As noted in Condition B44 Landscaping and Vegetation Management listed above, the approved landscape documentation is in accordance with the revised Architectural documentation pertaining to the location of the perimeter fenceline. As documented the location of the perimeter fencing is setback 3m from the property boundary shown on the Landscape Masterplan and Architectural Documentation.

The approved landscape documentation is listed below:

- LDA-001 - LANDSCAPE MASTERPLAN
- LDA-002 - TREE RETENTION PLAN
- LDA-003 - STAGE 4 LANDSCAPE PLAN
- LDA-004 - STAGE 1 & 2 LANDSCAPE PLAN
- LDA-005 - STAGE 3 LANDSCAPE PLAN
- LDA-006 - EXTERNAL STORAGE AREA LANDSCAPE PLAN
- LDA-007-01 - LANDSCAPE PLANTING DETAIL ENTRANCE
- LDA-007-02 - LANDSCAPE PLANTING DETAIL NORTHERN BUFFER
- LDA-007-03 - LANDSCAPE PLANTING DETAIL WESTERN BUFFER
- LDA-007-04 - LANDSCAPE PLANTING DETAIL SOUTHERN BUFFER
- LDA-008 - LANDSCAPE SECTIONS AA & FF
- LDA-009 - LANDSCAPE SECTION CC
- LDA-010 - LANDSCAPE SECTION DD
- LDA-011 - LANDSCAPE SECTION BB & EE
- LDA-012 - ENTRY STATEMENTS TYPICAL ELEVATION
- LDA-013 - LANDSCAPE DETAILS



## Operation Landscape Management Plan

The relevant areas pertaining to this Operational Landscape Management Plan refer to the revegetation and planting areas for the Minto Industrial Development. Detailed below is the approved landscape planting schedule detailing the plant growth size, planting densities, installation size and quantities as detailed in the individual schedules for each planting area on site:

### Overall Planting Schedule:

| NATIVE                            | BOTANICAL NAME                  | COMMON NAME                | NATIVE | MATURE HEIGHT | MATURE SPREAD | INSTALL SIZE | PLANTING DENSITY   |
|-----------------------------------|---------------------------------|----------------------------|--------|---------------|---------------|--------------|--------------------|
| <b>Large Trees</b>                |                                 |                            |        |               |               |              |                    |
| ALO LIT                           | <i>Allocastrum littoralis</i>   | Black She Oak              | ✓      | 12m           | 5m            | 400/ 45L     | 10m ctrs/ as shown |
| ANG COS                           | <i>Angophora costata</i>        | Smooth Barked Apple        | ✓      | 25m           | 15m           | 400/ 45L     | 10m ctrs/ as shown |
| ANG FLO                           | <i>Angophora floribunda</i>     | Rough Barked Apple         | ✓      | 25m           | 15m           | 400/ 45L     | 10m ctrs/ as shown |
| BRA ACE                           | <i>Brachychiton acerifolius</i> | Illawarra Flame Tree       | ✓      | 30m           | 10m           | 400/ 45L     | 10m ctrs/ as shown |
| COR CIT                           | <i>Corymbia citriodora</i>      | Lemon Scented Gum          | ✓      | 30m           | 15m           | 400/ 45L     | 10m ctrs/ as shown |
| COR GUM                           | <i>Corymbia gummiifera</i>      | Red Bloodwood              | ✓      | 15m           | 10m           | 400/ 45L     | 10m ctrs/ as shown |
| COR MAC                           | <i>Corymbia maculata</i>        | Spotted Gum                | ✓      | 22m           | 15m           | 400/ 45L     | 10m ctrs/ as shown |
| EUC AMP                           | <i>Eucalyptus amplifolia</i>    | Cabbage Gum                | ✓      | 20m           | 10m           | 400/ 45L     | 10m ctrs/ as shown |
| EUC CRE                           | <i>Eucalyptus crebra</i>        | Ironbark                   | ✓      | 35m           | 15m           | 400/ 45L     | 10m ctrs/ as shown |
| EUC MOL                           | <i>Eucalyptus moluccana</i>     | Grey Box                   | ✓      | 20m           | 15m           | 400/ 45L     | 10m ctrs/ as shown |
| EUC SID                           | <i>Eucalyptus sideroxylon</i>   | Mugga Ironbark             | ✓      | 25m           | 15m           | 400/ 45L     | 10m ctrs/ as shown |
| MAG LIT                           | <i>Magnolia 'Little Gem'</i>    | Magnolia                   | ✓      | 6m            | 3m            | 400/ 45L     | 10m ctrs/ as shown |
| MEL LIN                           | <i>Melaleuca viminalis</i>      | Weeping Bottlebrush        | ✓      | 10m           | 6m            | 400/ 45L     | 10m ctrs/ as shown |
| SYN GLO                           | <i>Syncarpia glomulifera</i>    | Turpentine                 | ✓      | 40m           | 20m           | 400/ 45L     | 10m ctrs/ as shown |
| TRI LAU                           | <i>Tristanopsis laurina</i>     | Water Gum                  | ✓      | 15m           | 6m            | 400/ 45L     | 10m ctrs/ as shown |
| <b>Small Trees / Large Shrubs</b> |                                 |                            |        |               |               |              |                    |
| ACA dec                           | <i>Acacia decurrens</i>         | Black Wattle               | ✓      | 10m           | 2m            | 200 / 75mm   | 1.5 / 2m ctrs      |
| ACA imp                           | <i>Acacia implexa</i>           | Hickory Wattle             | ✓      | 10m           | 2m            | 200 / 75mm   | 1.5 / 2m ctrs      |
| ACA flo                           | <i>Acacia floribunda</i>        | Sally Wattle               | ✓      | 4m            | 3m            | 200 / 75mm   | 2m ctrs            |
| ACA par                           | <i>Acacia parramattensis</i>    | Sydney GreenWattle         | ✓      | 8m            | 4m            | 200 / 75mm   | 3m ctrs            |
| ACM smi                           | <i>Acmena smithii</i>           | Lillypilly                 | ✓      | 4m            | 3m            | 200 / 75mm   | 2m ctrs            |
| BAC myr                           | <i>Backhousia myrtifolia</i>    | Grey Myrtle                | ✓      | 4m            | 3m            | 200 / 75mm   | 2m ctrs            |
| BAN eri                           | <i>Banksia ericifolia</i>       | Heath Banksia              | ✓      | 5m            | 2m            | 200 / 75mm   | 1.5m ctrs          |
| BAN ser                           | <i>Banksia serrata</i>          | Old Man Banksia            | ✓      | 8m            | 2m            | 200 / 75mm   | 1.5m ctrs          |
| BAN spi                           | <i>Banksia spinulosa</i>        | Hairpin Banksia            | ✓      | 8m            | 3m            | 200 / 75mm   | 2.5m ctrs          |
| CAL cit                           | <i>Callistemon citrinus</i>     | Crimson Bottlebrush        | ✓      | 2m            | 3m            | 200 / 75mm   | 2.5m ctrs          |
| CAL sal                           | <i>Callistemon salignus</i>     | Willow Bottlebrush         | ✓      | 4m            | 2m            | 200 / 75mm   | 1.5m ctrs          |
| CER gum                           | <i>Ceratopetalum gummiferum</i> | Christmas Bush             | ✓      | 4m            | 3m            | 200 / 75mm   | 2.5m ctrs          |
| DOD tri                           | <i>Dodonaea triquetra</i>       | Common Hop Bush            | ✓      | 3m            | 1m            | 200 / 75mm   | 0.8m ctrs          |
| MEL dec                           | <i>Melaleuca decora</i>         | White Feather Honey Myrtle | ✓      | 7m            | 2m            | 200 / 75mm   | 4m ctrs            |
| MEL lin                           | <i>Melaleuca linariifolia</i>   | Snow In Summer             | ✓      | 8m            | 3m            | 200 / 75mm   | 4m ctrs            |
| MEL sty                           | <i>Melaleuca styphelioides</i>  | Prickly Leaved Paper Bark  | ✓      | 15m           | 8m            | 200 / 75mm   | 6 / 8m ctrs        |
| SYZ aus                           | <i>Syzygium australe</i>        | Brush Cherry               | ✓      | 8m            | 3m            | 200 / 75mm   | 4m ctrs            |
| XAN aus                           | <i>Xanthorrhoea australis</i>   | Austral Grass Tree         | ✓      | 2m            | 2m            | 200 / 75mm   | As Shown           |
| <b>Small &amp; Medium Shrubs</b>  |                                 |                            |        |               |               |              |                    |
| AGA att                           | <i>Agave attenuata</i>          | Lion's Tail Agave          | ✓      | 1.5m          | 1m            | 200 / 75mm   | 0.5m ctrs          |
| CAL vim                           | <i>Callistemon 'Green John'</i> | Bottlebrush                | ✓      | 1m            | 1m            | 200 / 75mm   | 1m ctrs            |
| CRA arb                           | <i>Crassula arborescens</i>     | Blue Bird                  | ✓      | 1m            | 0.5m          | 200 / 75mm   | 0.5m ctrs          |
| DIA rev                           | <i>Dianella revoluta</i>        | Blue Flax-lily             | ✓      | 0.8m          | 0.8m          | 200 / 75mm   | 0.5m ctrs          |
| DOR exc                           | <i>Doryanthes excelsa</i>       | Gymea Lilly                | ✓      | 2m            | 1.5m          | 200 / 75mm   | 1.5 / 2m ctrs      |
| ERI aus                           | <i>Eriostemon australasius</i>  | Pink Wax Flower            | ✓      | 2m            | 1.5m          | 200 / 75mm   | 1m ctrs            |
| IND aus                           | <i>Indigofera australis</i>     | Native Indigo              | ✓      | 1.5m          | 1.5m          | 200 / 75mm   | 1m ctrs            |
| KUN amb                           | <i>Kunzea ambigua</i>           | Tick Bush                  | ✓      | 2m            | 2m            | 200 / 75mm   | 1.5m ctrs          |
| MEL thy                           | <i>Melaleuca thymifolia</i>     | Thyme Honey Myrtle         | ✓      | 1m            | 1m            | 200 / 75mm   | 0.5m ctrs          |
| <b>Groundcovers &amp; Grasses</b> |                                 |                            |        |               |               |              |                    |
| BAU spp                           | <i>Baumea SPP.</i>              | Square Twig Rush Bare      | ✓      | 0.3m          | 0.5m          | 50mm Tube    | 5m2                |
| CAR spp                           | <i>Carrex SPP.</i>              | Strand Sedge Drooping      | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2                |
| CLE ari                           | <i>Clematis aristata</i>        | Old Mans Beard             | ✓      | Creeper       | 1.5m          | 50mm Tube    | 3m2                |
| DIC rep                           | <i>Dichondra repens</i>         | Kidney Weed                | ✓      | Creeper       | 1m            | 50mm Tube    | 3m2                |
| DIA cae                           | <i>Dianella caerulea</i>        | Blue Flax-lily             | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2                |
| DIA lon                           | <i>Dianella longifolia</i>      | Smooth Flax Lilly          | ✓      | 0.8m          | 0.8m          | 50mm Tube    | 5m2                |
| HAR vio                           | <i>Hardenbergia violacea</i>    | False Sarsaparilla         | ✓      | Creeper       | 2m            | 50mm Tube    | 3m2                |
| LOM fil                           | <i>Lomandra filiformis</i>      | Wattle Mat-rush            | ✓      | 0.3m          | 0.5m          | 50mm Tube    | 5m2                |
| LOM lon                           | <i>Lomandra longifolia</i>      | Spiny Head Mat-rush        | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2                |
| LOM mul                           | <i>Lomandra multiflora</i>      | Many Flowered Mat-rush     | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2                |
| PAN pan                           | <i>Pandorea Pandorana</i>       | Wonga Wonga Vine           | ✓      | Creeper       | 5m            | 50mm Tube    | 3m2                |
| VIO hed                           | <i>Viola Hederacea</i>          | Native Violet              | ✓      | Creeper       | 2m            | 50mm Tube    | 3m2                |
| THE aus                           | <i>Themeda australis</i>        | Kangaroo Grass             | ✓      | 1m            | 0.5m          | 50mm Tube    | 5m2                |

## Operation Landscape Management Plan

### Entry Planting Schedule:

| NATIVE                            | BOTANICAL NAME                  | COMMON NAME            | NATIVE | MATURE HEIGHT | MATURE SPREAD | INSTALL SIZE | PLANTING DENSITY | QTY* | ESTIMATED QTY* |
|-----------------------------------|---------------------------------|------------------------|--------|---------------|---------------|--------------|------------------|------|----------------|
| <b>Large Trees</b>                |                                 |                        |        |               |               |              |                  |      |                |
| BRA ACE                           | <i>Brachychiton acerifolius</i> | Illawarra Flame Tree   | ✓      | 20m           | 10m           | 45L          | AS SHOWN         | 7    | 22             |
| COR MAC                           | <i>Corymbia maculata</i>        | Spotted Gum            | ✓      | 22m           | 15m           | 45L          | AS SHOWN         | 9    | 29             |
| MAG LIT                           | <i>Magnolia 'Little Gem'</i>    | Magnolia               |        | 6m            | 4m            | 45L          | AS SHOWN         | 4    | 13             |
| MEL VIM                           | <i>Melaleuca viminalis</i>      | Weeping Bottlebrush    | ✓      | 10m           | 6m            | 45L          | AS SHOWN         | 4    | 13             |
| TRI LAU                           | <i>Tristanopsis laurina</i>     | Water Gum              | ✓      | 15m           | 6m            | 45L          | AS SHOWN         | 4    | 13             |
| <b>Small Trees / Large Shrubs</b> |                                 |                        |        |               |               |              |                  |      |                |
| BAN eri                           | <i>Banksia ericifolia</i>       | Heath Banksia          | ✓      | 5m            | 2m            | 200mm        | AS SHOWN         | 9    | 29             |
| <b>Small &amp; Medium Shrubs</b>  |                                 |                        |        |               |               |              |                  |      |                |
| AGA att                           | <i>Agave attenuata</i>          | Lion's Tail Agave      |        | 1.5m          | 1m            | 200mm        | AS SHOWN         | 43   | 138            |
| CAL vim                           | <i>Callistemon 'Green John'</i> | Bottlebrush            | ✓      | 1m            | 1m            | 200mm        | AS SHOWN         | 11   | 36             |
| COR alb                           | <i>Correa alba</i>              | White Correa           | ✓      | 1.5m          | 1.5m          | 200mm        | AS SHOWN         | 9    | 29             |
| CRA arb                           | <i>Crassula arborescens</i>     | Blue Bird              |        | 1m            | 0.5m          | 200mm        | AS SHOWN         | 29   | 93             |
| DOR exc                           | <i>Dorothy's excelsa</i>        | Gymea Lilly            | ✓      | 2m            | 1.5m          | 200mm        | AS SHOWN         | 48   | 154            |
| MEL lin                           | <i>Melaleuca linifolia</i>      | Claret Tops            | ✓      | 1.2m          | 1m            | 200mm        | AS SHOWN         | 19   | 61             |
| MEL thy                           | <i>Melaleuca thymifolia</i>     | Thyme Honey Myrtle     | ✓      | 1m            | 1m            | 200mm        | AS SHOWN         | 7    | 22             |
| SYZ AUS                           | <i>Syzygium 'Baby Boomer'</i>   | Lilly Pilly            | ✓      | 2m            | 1.2m          | 300mm        | AS SHOWN         | 15   | 48             |
| WES tru                           | <i>Westringia fruticosa</i>     | Coastal rosemary       | ✓      | 2m            | 2m            | 200mm        | AS SHOWN         | 115  | 368            |
| <b>Groundcovers &amp; Grasses</b> |                                 |                        |        |               |               |              |                  |      |                |
| DIA cae                           | <i>Dianella caerulea</i>        | Blue Flax-lily         | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2              | 3887 | 12438          |
| DIA lon                           | <i>Dianella longifolia</i>      | Smooth Flax Lilly      | ✓      | 0.8m          | 0.8m          | 50mm Tube    | 5m2              | 579  | 1874           |
| LOM lon                           | <i>Lomandra longifolia</i>      | Spiny Head Mat-rush    | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2              | 1850 | 5920           |
| LOM mul                           | <i>Lomandra multiflora</i>      | Many Flowered Mat-rush | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2              | 450  | 1456           |

### Northern Planting Schedule:

| CODE                              | BOTANICAL NAME                  | COMMON NAME            | NATIVE | MATURE HEIGHT | MATURE SPREAD | INSTALL SIZE | PLANTING DENSITY | QTY* | ESTIMATED QUANTITY** |
|-----------------------------------|---------------------------------|------------------------|--------|---------------|---------------|--------------|------------------|------|----------------------|
| <b>Large Trees</b>                |                                 |                        |        |               |               |              |                  |      |                      |
| ANG COS                           | <i>Angophora costata</i>        | Smooth Barked Apple    | ✓      | 25m           | 15m           | 400L         | 10m centres      | 2    | 5                    |
| ANG FLO                           | <i>Angophora floribunda</i>     | Rough Barked Apple     | ✓      | 25m           | 15m           | 400L         | 10m centres      | 3    | 8                    |
| EUC AMP                           | <i>Eucalyptus amplifolia</i>    | Cabbage Gum            | ✓      | 20m           | 10m           | 400L         | 10m centres      | 3    | 8                    |
| EUC MOL                           | <i>Eucalyptus moluccana</i>     | Grey Box               | ✓      | 20m           | 15m           | 400L         | 10m centres      | 1    | 3                    |
| EUC SID                           | <i>Eucalyptus sideroxylon</i>   | Mugga Ironbark         | ✓      | 25m           | 15m           | 400L         | 10m centres      | 3    | 8                    |
| <b>Small Trees / Large Shrubs</b> |                                 |                        |        |               |               |              |                  |      |                      |
| ACA dec                           | <i>Acacia decurrens</i>         | Black Wattle           | ✓      | 10m           | 2m            | 75mm         | AS SHOWN         | 2    | 5                    |
| ACA imp                           | <i>Acacia implexa</i>           | Hickory Wattle         | ✓      | 10m           | 2m            | 75mm         | AS SHOWN         | 2    | 5                    |
| ACA flo                           | <i>Acacia floribunda</i>        | Sally Wattle           | ✓      | 4m            | 3m            | 75mm         | AS SHOWN         | 3    | 8                    |
| ACA par                           | <i>Acacia parramattensis</i>    | Sydney Green Wattle    | ✓      | 8m            | 4m            | 75mm         | AS SHOWN         | 1    | 3                    |
| BAN eri                           | <i>Banksia ericifolia</i>       | Heath Banksia          | ✓      | 5m            | 2m            | 75mm         | AS SHOWN         | 3    | 8                    |
| BAN ser                           | <i>Banksia serrata</i>          | Old Man Banksia        | ✓      | 8m            | 2m            | 75mm         | AS SHOWN         | 1    | 3                    |
| CAL cit                           | <i>Callistemon citrinus</i>     | Crimson Bottlebrush    | ✓      | 2m            | 3m            | 75mm         | AS SHOWN         | 4    | 10                   |
| CAL sal                           | <i>Callistemon salignus</i>     | Willow Bottlebrush     | ✓      | 4m            | 2m            | 75mm         | AS SHOWN         | 5    | 13                   |
| CER gum                           | <i>Ceratopetalum gummiferum</i> | Christmas Bush         | ✓      | 4m            | 3m            | 75mm         | AS SHOWN         | 6    | 15                   |
| MEL dec                           | <i>Melaleuca decora</i>         | Honey Myrtle           | ✓      | 7m            | 2m            | 75mm         | AS SHOWN         | 5    | 13                   |
| SYZ aus                           | <i>Syzygium australe</i>        | Brush Cherry           | ✓      | 8m            | 3m            | 75mm         | AS SHOWN         | 8    | 21                   |
| <b>Small &amp; Medium Shrubs</b>  |                                 |                        |        |               |               |              |                  |      |                      |
| ERI aus                           | <i>Eriostemon australis</i>     | Pink Wax Flower        | ✓      | 2m            | 1.5m          | 75mm         | AS SHOWN         | 16   | 41                   |
| IND aus                           | <i>Indigofera australis</i>     | Native Indigo          | ✓      | 1.5m          | 1.5m          | 75mm         | AS SHOWN         | 24   | 62                   |
| KUN amb                           | <i>Kunzea ambigua</i>           | Tick Bush              | ✓      | 2m            | 2m            | 75mm         | AS SHOWN         | 24   | 62                   |
| <b>Groundcovers &amp; Grasses</b> |                                 |                        |        |               |               |              |                  |      |                      |
| BAU spp                           | <i>Baumea SPP</i>               | Square Twig Rush Bare  | ✓      | 0.3m          | 0.5m          | 50mm Tube    | 5m2              | 212  | 543                  |
| CAR spp                           | <i>Carax SPP</i>                | Strand Sedge Drooping  | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2              | 175  | 448                  |
| CLE ari                           | <i>Clematis aristata</i>        | Old Mans Beard         | ✓      | Creepers      | 1.5m          | 50mm Tube    | 3m2              | 70   | 179                  |
| DIC rep                           | <i>Dichondra repens</i>         | Kidney Weed            | ✓      | Creepers      | 1m            | 50mm Tube    | 3m2              | 82   | 210                  |
| DIA cae                           | <i>Dianella caerulea</i>        | Blue Flax-lily         | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2              | 291  | 746                  |
| DIA lon                           | <i>Dianella longifolia</i>      | Smooth Flax Lilly      | ✓      | 0.8m          | 0.8m          | 50mm Tube    | 5m2              | 333  | 853                  |
| HAR vio                           | <i>Hardenbergia violacea</i>    | False Sarsaparilla     | ✓      | Creepers      | 2m            | 50mm Tube    | 3m2              | 82   | 210                  |
| LOM fil                           | <i>Lomandra filiformis</i>      | Wattle Mat-rush        | ✓      | 0.3m          | 0.5m          | 50mm Tube    | 5m2              | 291  | 746                  |
| LOM lon                           | <i>Lomandra longifolia</i>      | Spiny Head Mat-rush    | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2              | 333  | 853                  |
| LOM mul                           | <i>Lomandra multiflora</i>      | Many Flowered Mat-rush | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2              | 228  | 584                  |
| PAN pan                           | <i>Pandorea pandorana</i>       | Wonga Wonga Vine       | ✓      | Creepers      | 5m            | 50mm Tube    | 3m2              | 82   | 210                  |
| VIO hed                           | <i>Viola hederacea</i>          | Native Violet          | ✓      | Creepers      | 2m            | 50mm Tube    | 3m2              | 70   | 179                  |
| THE aus                           | <i>Themeda australis</i>        | Kangaroo Grass         | ✓      | 1m            | 0.5m          | 50mm Tube    | 5m2              | 137  | 351                  |



## Operation Landscape Management Plan

### Southern Planting Schedule:

| NATIVE                            | BOTANICAL NAME                  | COMMON NAME         | NATIVE | MATURE HEIGHT | MATURE SPREAD | INSTALL SIZE | PLANTING DENSITY | QTY* | ESTIMATED QUANTITY** |
|-----------------------------------|---------------------------------|---------------------|--------|---------------|---------------|--------------|------------------|------|----------------------|
| <b>Large Trees</b>                |                                 |                     |        |               |               |              |                  |      |                      |
| ANG FLO                           | <i>Angophora floribunda</i>     | Rough Barked Apple  | ✓      | 25m           | 15m           | 400 / 45L    | 10m centres      | 3    | 5                    |
| COR CIT                           | <i>Corymbia citriodora</i>      | Lemon Scented Gum   | ✓      | 30m           | 15m           | 400 / 45L    | 10m centres      | 1    | 2                    |
| COR MAC                           | <i>Corymbia maculata</i>        | Spotted Gum         | ✓      | 30m           | 15m           | 400 / 45L    | 10m centres      | 4    | 7                    |
| EUC AMP                           | <i>Eucalyptus amplifolia</i>    | Cabbage Gum         | ✓      | 20m           | 10m           | 400 / 45L    | 10m centres      | 2    | 4                    |
| EUC CRE                           | <i>Eucalyptus crebra</i>        | Ironbark            | ✓      | 35m           | 15m           | 400 / 45L    | 10m centres      | 4    | 7                    |
| EUC MOL                           | <i>Eucalyptus moluccana</i>     | Grey Box            | ✓      | 20m           | 15m           | 400 / 45L    | 10m centres      | 1    | 2                    |
| EUC SID                           | <i>Eucalyptus sideroxylon</i>   | Mugga Ironbark      | ✓      | 25m           | 15m           | 400 / 45L    | 10m centres      | 2    | 4                    |
| <b>Small Trees / Large Shrubs</b> |                                 |                     |        |               |               |              |                  |      |                      |
| ACA dec                           | <i>Acacia decurrens</i>         | Black Wattle        | ✓      | 10m           | 2m            | 75mm         | AS SHOWN         | 5    | 9                    |
| ACA flo                           | <i>Acacia floribunda</i>        | Sally Wattle        | ✓      | 4m            | 3m            | 75mm         | AS SHOWN         | 4    | 7                    |
| ACA par                           | <i>Acacia parramattensis</i>    | Sydney GreenWattle  | ✓      | 8m            | 4m            | 75mm         | AS SHOWN         | 9    | 16                   |
| ACM smi                           | <i>Acmena smithii</i>           | Lillypilly          | ✓      | 4m            | 3m            | 75mm         | AS SHOWN         | 9    | 16                   |
| BAC myr                           | <i>Backhousia myrtifolia</i>    | Grey Myrtle         | ✓      | 4m            | 3m            | 75mm         | AS SHOWN         | 8    | 14                   |
| BAN eri                           | <i>Banksia ericifolia</i>       | Heath Banksia       | ✓      | 5m            | 2m            | 75mm         | AS SHOWN         | 14   | 25                   |
| CAL sal                           | <i>Callistemon salignus</i>     | Willow Bottlebrush  | ✓      | 4m            | 2m            | 75mm         | AS SHOWN         | 5    | 9                    |
| CER gum                           | <i>Ceratopetalum gummiferum</i> | Christmas Bush      | ✓      | 4m            | 3m            | 75mm         | AS SHOWN         | 11   | 19                   |
| MEL dec                           | <i>Melaleuca decora</i>         | Honey Myrtle        | ✓      | 7m            | 2m            | 75mm         | AS SHOWN         | 5    | 9                    |
| SYZ aus                           | <i>Syzygium australe</i>        | Brush Cherry        | ✓      | 8m            | 3m            | 75mm         | AS SHOWN         | 12   | 21                   |
| <b>Small &amp; Medium Shrubs</b>  |                                 |                     |        |               |               |              |                  |      |                      |
| ERI aus                           | <i>Eriostemon australasius</i>  | Pink Wax Flower     | ✓      | 2m            | 1.5m          | 75mm         | AS SHOWN         | 53   | 94                   |
| IND aus                           | <i>Indigofera australis</i>     | Native Indigo       | ✓      | 1.5m          | 1.5m          | 75mm         | AS SHOWN         | 39   | 69                   |
| KUN amb                           | <i>Kunzea ambigua</i>           | Tick Bush           | ✓      | 2m            | 2m            | 75mm         | AS SHOWN         | 18   | 32                   |
| <b>Groundcovers &amp; Grasses</b> |                                 |                     |        |               |               |              |                  |      |                      |
| BAU spp                           | <i>Baumea SPP.</i>              | Square Twig Rush    | ✓      | 0.3m          | 0.5m          | 50mm Tube    | 5m2              | 288  | 510                  |
| CAR spp                           | <i>Carrex SPP.</i>              | Strand Sedge        | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2              | 235  | 416                  |
| CLE ari                           | <i>Clematis aristata</i>        | Old Mans Beard      | ✓      | Creeper       | 1.5m          | 50mm Tube    | 3m2              | 93   | 165                  |
| DIC rep                           | <i>Dichondra repens</i>         | Kidney Weed         | ✓      | Creeper       | 1m            | 50mm Tube    | 3m2              | 112  | 198                  |
| DIA cae                           | <i>Dianella caerulea</i>        | Blue Flax-lily      | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2              | 389  | 689                  |
| DIA lon                           | <i>Dianella longifolia</i>      | Smooth Flax Lilly   | ✓      | 0.8m          | 0.8m          | 50mm Tube    | 5m2              | 454  | 804                  |
| HAR vio                           | <i>Hardenbergia violacea</i>    | False Sarsaparilla  | ✓      | Creeper       | 2m            | 50mm Tube    | 3m2              | 112  | 198                  |
| LOM fil                           | <i>Lomandra filiformis</i>      | Wattle Mat-rush     | ✓      | 0.3m          | 0.5m          | 50mm Tube    | 5m2              | 389  | 689                  |
| LOM lon                           | <i>Lomandra longifolia</i>      | Spiny Head Mat-rush | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2              | 377  | 667                  |
| LOM mul                           | <i>Lomandra multiflora</i>      | Mat-rush            | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2              | 310  | 549                  |
| PAN pan                           | <i>Pandorea Pandorana</i>       | Wonga Wonga Vine    | ✓      | Creeper       | 5m            | 50mm Tube    | 3m2              | 112  | 198                  |
| VIO hed                           | <i>Viola Hederacea</i>          | Native Violet       | ✓      | Creeper       | 2m            | 50mm Tube    | 3m2              | 93   | 165                  |
| THE aus                           | <i>Themeda australis</i>        | Kangaroo Grass      | ✓      | 1m            | 0.5m          | 50mm Tube    | 5m2              | 235  | 416                  |

### Western Planting Schedule:

| NATIVE                            | BOTANICAL NAME                  | COMMON NAME               | NATIVE | MATURE HEIGHT | MATURE SPREAD | INSTALL SIZE | PLANTING DENSITY | QTY* | ESTIMATED QUANTITY** |
|-----------------------------------|---------------------------------|---------------------------|--------|---------------|---------------|--------------|------------------|------|----------------------|
| <b>Large Trees</b>                |                                 |                           |        |               |               |              |                  |      |                      |
| ANG FLO                           | <i>Angophora floribunda</i>     | Rough Barked Apple        | ✓      | 25m           | 15m           | 45L          | 10m centres      | 2    | 2                    |
| COR GUM                           | <i>Corymbia gummifera</i>       | Red Bloodwood             | ✓      | 15m           | 10m           | 45L          | 10m centres      | 1    | 1                    |
| COR MAC                           | <i>Corymbia maculata</i>        | Spotted Gum               | ✓      | 22m           | 15m           | 45L          | 10m centres      | 2    | 2                    |
| EUC AMP                           | <i>Eucalyptus amplifolia</i>    | Cabbage Gum               | ✓      | 20m           | 10m           | 45L          | 10m centres      | 2    | 2                    |
| EUC SID                           | <i>Eucalyptus sideroxylon</i>   | Mugga Ironbark            | ✓      | 25m           | 15m           | 45L          | 10m centres      | 2    | 2                    |
| <b>Small Trees / Large Shrubs</b> |                                 |                           |        |               |               |              |                  |      |                      |
| ACA dec                           | <i>Acacia decurrens</i>         | Black Wattle              | ✓      | 10m           | 2m            | 200mm        | AS SHOWN         | 7    | 52                   |
| ACA flo                           | <i>Acacia floribunda</i>        | Sally Wattle              | ✓      | 4m            | 3m            | 200mm        | AS SHOWN         | 9    | 66                   |
| ACM smi                           | <i>Acmena smithii</i>           | Lillypilly                | ✓      | 4m            | 3m            | 200mm        | AS SHOWN         | 6    | 44                   |
| BAN ser                           | <i>Banksia serrata</i>          | Old Man Banksia           | ✓      | 8m            | 2m            | 200mm        | AS SHOWN         | 5    | 37                   |
| CER gum                           | <i>Ceratopetalum gummiferum</i> | Christmas Bush            | ✓      | 4m            | 3m            | 200mm        | AS SHOWN         | 3    | 22                   |
| DOD tri                           | <i>Dodonaea triquetra</i>       | Common Hop Bush           | ✓      | 3m            | 1m            | 200mm        | AS SHOWN         | 5    | 37                   |
| MEL lin                           | <i>Melaleuca linariifolia</i>   | Snow In Summer            | ✓      | 8m            | 3m            | 200mm        | AS SHOWN         | 4    | 30                   |
| MEL sty                           | <i>Melaleuca stypheloides</i>   | Prickly Leaved Paper Bark | ✓      | 15m           | 8m            | 200mm        | AS SHOWN         | 3    | 22                   |
| SYZ aus                           | <i>Syzygium australe</i>        | Brush Cherry              | ✓      | 8m            | 3m            | 200mm        | AS SHOWN         | 4    | 30                   |
| <b>Small &amp; Medium Shrubs</b>  |                                 |                           |        |               |               |              |                  |      |                      |
| DIA rev                           | <i>Dianella revoluta</i>        | Blue Flax-lily            | ✓      | 0.8m          | 0.8m          | 200mm        | AS SHOWN         | 15   | 111                  |
| ERI aus                           | <i>Eriostemon australasius</i>  | Pink Wax Flower           | ✓      | 2m            | 1.5m          | 200mm        | AS SHOWN         | 14   | 103                  |
| IND aus                           | <i>Indigofera australis</i>     | Native Indigo             | ✓      | 1.5m          | 1.5m          | 200mm        | AS SHOWN         | 8    | 59                   |
| KUN amb                           | <i>Kunzea ambigua</i>           | Tick Bush                 | ✓      | 2m            | 2m            | 200mm        | AS SHOWN         | 17   | 125                  |
| MEL thy                           | <i>Melaleuca thymifolia</i>     | Thyme Honey Myrtle        | ✓      | 1m            | 1m            | 200mm        | AS SHOWN         | 17   | 125                  |
| <b>Groundcovers &amp; Grasses</b> |                                 |                           |        |               |               |              |                  |      |                      |
| BAU spp                           | <i>Baumea SPP.</i>              | Square Twig Rush Bare     | ✓      | 0.3m          | 0.5m          | 50mm Tube    | 5m2              | 49   | 362                  |
| CAR spp                           | <i>Carrex SPP.</i>              | Strand Sedge Drooping     | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2              | 56   | 413                  |
| CLE ari                           | <i>Clematis aristata</i>        | Old Mans Beard            | ✓      | Creeper       | 1.5m          | 50mm Tube    | 3m2              | 22   | 162                  |
| DIC rep                           | <i>Dichondra repens</i>         | Kidney Weed               | ✓      | Creeper       | 1m            | 50mm Tube    | 3m2              | 19   | 140                  |
| DIA cae                           | <i>Dianella caerulea</i>        | Blue Flax-lily            | ✓      | 0.5m          | 0.5m          | 50mm Tube    | 5m2              | 90   | 664                  |
| DIA lon                           | <i>Dianella longifolia</i>      | Smooth Flax Lilly         | ✓      | 0.8m          | 0.8m          | 50mm Tube    | 5m2              | 81   | 598                  |
| HAR vio                           | <i>Hardenbergia violacea</i>    | False Sarsaparilla        | ✓      | Creeper       | 2m            | 50mm Tube    | 3m2              | 19   | 140                  |
| LOM fil                           | <i>Lomandra filiformis</i>      | Wattle Mat-rush           | ✓      | 0.3m          | 0.5m          | 50mm Tube    | 5m2              | 90   | 664                  |
| LOM lon                           | <i>Lomandra longifolia</i>      | Spiny Head Mat-rush       | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2              | 80   | 590                  |
| LOM mul                           | <i>Lomandra multiflora</i>      | Many Flowered Mat-rush    | ✓      | 0.7m          | 0.7m          | 50mm Tube    | 5m2              | 53   | 391                  |
| PAN pan                           | <i>Pandorea Pandorana</i>       | Wonga Wonga Vine          | ✓      | Creeper       | 5m            | 50mm Tube    | 3m2              | 19   | 140                  |
| VIO hed                           | <i>Viola Hederacea</i>          | Native Violet             | ✓      | Creeper       | 2m            | 50mm Tube    | 3m2              | 22   | 162                  |
| THE aus                           | <i>Themeda australis</i>        | Kangaroo Grass            | ✓      | 1m            | 0.5m          | 50mm Tube    | 5m2              | 56   | 413                  |

## Softscapes Methodology

The following methodology highlights the measures and management schedules for the revegetation and planting areas for the Minto Industrial Development to be undertaken by the engaged Landscape Contractor. Ongoing maintenance and management of the specified planting will be undertaken by a Landscape Contractor generally in accordance with the items detailed below, as well as additional works as required where identified during routine inspections. The Contractor is to keep a log book recording when and what maintenance work has been undertaken and what materials, including toxic materials have been used. The log book should be made available for inspection upon request.

### Fertilising:

The intent is to replenish the soil with fertiliser appropriate for all the native species and garden beds across site to ensure plants have the required amount of nutrients to flourish. Fertiliser is to be applied as per the manufacturers specification during August (end of winter) and in March (beginning of Autumn), 6 months apart to ensure plants have time to replenish and flourish between applications. This will be completed as part of the maintenance program by the Landscape Contractor.

### Herbicide & Pesticide Application:

The landscape management requires herbicide and pesticide to be applied to all plants to ensure no unwanted weeds or pests develop within the garden beds and on the plants themselves. The purpose of this process is monitor the continued health of plants and to prevent the on set of weeds that may impact the ability for the plant to establish and survive long term. Weeding is to occur around the base of the trees and planted areas at intervals outlined by the Landscape Contractor. All weeds, debris, clippings, etc. shall be removed off site as soon as possible by the Landscape Contractor. Herbicide, similar to the fertilising application is to be applied only as per the manufacturer's specification during both August and March, 6 Months apart to allow the plant material to flourish where possible. As per the Charter Hall Specifications, a biological control test is recommended as a first trial approach. If this control is unsuccessful, herbicides that are NATSPEC approved may be used.

In relation to Pesticide this aims to respond to all occurrences of insect attack, pests or disease amongst the plant material to ensure the plant is not hindered in growth or visual impact. Pesticide application is to be applied only as per the manufacturer's specification during Spring however plants are to be continually monitored during other inspections and work time frames to ensure no diseases are become present.

### Horticultural Work & Inspection

The purpose for Horticultural work is to undertake inspections of all plants within garden beds and tree planting. These inspections aim to monitor plant health, tree stakes, hedging, weed control, litter collection, pruning and damage due to vandalism to all plant stock. In relation to pruning work shall be implemented to maintain dense foliage and encourage suitable growth habits. Any branches overhanging or obstructing pathways and roads shall be removed as directed by the Construction manager. Furthermore, underpruning of trees is to be undertaken in areas that require maximised sight lines for CPTED and traffic management requirements. Underpruning promotes an elevated crown and clear stem to allow for a clear line of sight through/under the tree. This is applicable for all trees located in close proximity to site entrances, roads and carparks. Shrub planting has been proposed to not exceed 3m within close proximity of the substation however should be monitored and pruned where necessary if they exceed this expectation. Furthermore, pruning in accordance with Endeavour Energy requirements should be undertaken for any branches/tree canopies that are within 3m of powerlines or electrical easements.

Monitoring of plants is required to ensure all plants are showing signs of good health and vigour. In regards to vandalism and replacements, all plants that have failed, been damaged or stolen and mulch that has been removed or eroded during the Defects Liability Period due to inadequate or incorrect maintenance and supervision by the Landscape Contractor, are to be replaced at the Landscape Contractors own expense. Plants lost due to vandalism or theft during the Maintenance Period, beyond the control of the Landscape Contractor, are to be replaced at the Client's expense. The Landscape Contractor shall be responsible for theft, vandalism and wilful damage up to the date of the Defect's Warranty Period as per the maintenance contract

The general horticultural work and inspection is to be undertaken twice a month throughout the year to ensure that each of the tasks highlighted above are ongoing in order for plants to flourish and the design intent of the documentation to be maintained



## Mulching

The intent is to ensure that garden beds are installed with 75mm depth of mulch as specified in the landscape documentation to retain moisture in soil, maintain soil temperature and suppress weeds where required. The landscape management for mulching also includes reinstating mulch to the depths as specified where subsided or reduced in the garden bed and irrigation pipes are exposed. As per the Charter Hall specification, the garden beds should be inspected fortnightly and topped up by the Landscape Contractor where required.

## Tree Inspection

Tree inspection forms are to be completed once a month to review the health and vigour of all tree species located across the site. These ensure that trees are constantly monitored for any diseases and other elements that may hinder the overall growth habit and health. In addition to this, allow the Contractor to review if any tree replacements are required in accordance with the maintenance schedule. In addition to this, tree audits should be undertaken by a qualified Arborist longer term to review tree health and ensure all specimens are free from dead limbs that may become susceptible to limb drop and other risks.

### Typical Tree Inspection Form:

#### General

|           |                                         |
|-----------|-----------------------------------------|
| Date      | Reference                               |
| Purchaser |                                         |
| Supplier  | Inspected by (supplier/purchaser/agent) |
| Species   | Batch identification                    |

|                               |        |
|-------------------------------|--------|
| Labelling                     | Yes/No |
| Health and vigour             | Yes/No |
| Freedom from pests/disease    | Yes/No |
| Freedom from injury           | Yes/No |
| Self-supporting               | Yes/No |
| Stem taper                    | Yes/No |
| Pruning                       | Yes/No |
| Apical dominance              | Yes/No |
| Crown symmetry                | Yes/No |
| Included bank                 | Yes/No |
| Trunk position                | Yes/No |
| Compatibility of graft unions | Yes/No |
| Indication of north           | Yes/No |

#### Conformance with specification

|            |        |
|------------|--------|
| Conforming | Yes/No |
| Comments   |        |

#### Balance

|         |        |
|---------|--------|
| Balance | Yes/No |
|---------|--------|

## Maintenance of Environmental Factors

In response to the Environment Management Guidelines for Construction, measures have been put in place to mitigate any greater impacts to the surrounding environment, flora and fauna. All plant stock has been selected carefully to respond to the requirements for the industrial development and that respond to the existing ecological community. Both native planting and planting indigenous to the local area have been selected to minimise the effects of invasive species, exotics and pests on the local ecological community.

In addition to this, the continued management of environmental factors is critical through the operational and maintenance periods to ensure there is no disturbance to the local ecological community. The contractor under the operational and maintenance contract is to be across all statutory obligations relating to activities, products and services that may pose risks to the environment. These risks include any form of pollution or impact to the air, water and land environments of the site or any adjoining sites, as well as any adverse effects of waste management.



## Landscape Maintenance Schedule

| TASK DESCRIPTION                                                         | FREQUENCY: 0-6 MONTHS                                               | FREQUENCY: 6-12 MONTHS                          |
|--------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------|
| <b>TREES</b>                                                             |                                                                     |                                                 |
| VISUAL INSPECTION OF ALL TREES                                           | FORTNIGHTLY IN SUMMER/ MONTHLY IN WINTER                            | MONTHLY IN SUMMER/ ONCE IN WINTER               |
| MANUALLY INSPECT WATER LEVELS TO TREES                                   | FORTNIGHTLY IN SUMMER/ MONTHLY IN WINTER                            | MONTHLY IN SUMMER/ ONCE IN WINTER               |
| INSPECT DAMAGE TO TREES                                                  | FORTNIGHTLY IN SUMMER/ MONTHLY IN WINTER                            | MONTHLY IN SUMMER/ ONCE IN WINTER               |
| REPLACE ANY TAPING TO TREES                                              | FORTNIGHTLY IN SUMMER/ MONTHLY IN WINTER                            | MONTHLY IN SUMMER/ ONCE IN WINTER               |
| PRUNE DEAD OR DAMAGED BRANCHES                                           | FORTNIGHTLY IN SUMMER/ MONTHLY IN WINTER                            | MONTHLY IN SUMMER/ ONCE IN WINTER               |
| CHECK FOR AND REPORT PESTS & DISEASES                                    | FORTNIGHTLY                                                         | MONTHLY                                         |
| REPLACE FAILED OR DAMAGED TREES                                          | FORTNIGHTLY AS REQUIRED                                             | MONTHLY AS REQUIRED                             |
| PRUNE BRANCHES IN PROXIMITY TO POWERLINES AND ELECTRICAL EASEMENTS       | AS REQUIRED                                                         | AS REQUIRED                                     |
| SPRAY IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS                  | AS REQUIRED                                                         | AS REQUIRED                                     |
| ADJUST & OR REPLACE STAKES & TIES WHERE NECESSARY                        | AS REQUIRED                                                         | AS REQUIRED                                     |
| <b>TURF</b>                                                              |                                                                     |                                                 |
| MOW ALL TURF AREAS TO MAINTAIN HEIGHT BETWEEN 25-35MM                    | WEEKLY IN SUMMER/ MONTHLY IN WINTER                                 | FORTNIGHTLY IN SUMMER/ EVERY 2 MONTHS IN WINTER |
| TRIM EDGES OF ALL TURF AREAS                                             | WEEKLY IN SUMMER/ MONTHLY IN WINTER                                 | FORTNIGHTLY IN SUMMER/ EVERY 2 MONTHS IN WINTER |
| REMOVE CLIPPINGS FROM SITE                                               | WEEKLY IN SUMMER/ MONTHLY IN WINTER                                 | FORTNIGHTLY IN SUMMER/ EVERY 2 MONTHS IN WINTER |
| REMOVE LITTER & DEBRIS FROM TURF AREAS                                   | WEEKLY IN SUMMER/ MONTHLY IN WINTER                                 | FORTNIGHTLY IN SUMMER/ EVERY 2 MONTHS IN WINTER |
| CHECK FOR AND REPORT PESTS & DISEASES                                    | FORTNIGHTLY                                                         | MONTHLY                                         |
| SPRAY IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS                  | AS REQUIRED                                                         | AS REQUIRED                                     |
| MONITOR AND APPLY FERTILISER TO TURF AREAS                               | 6 MONTH INTERVALS - AUTUMN/SPRING                                   | YEARLY - SPRING                                 |
| <b>MULCH</b>                                                             |                                                                     |                                                 |
| REMOVE LITTER & DEBRIS FROM MULCH AREAS                                  | FORTNIGHTLY                                                         | MONTHLY                                         |
| REMOVE WEED GROWTH IN MULCH AREAS                                        | FORTNIGHTLY                                                         | MONTHLY                                         |
| TOP UP MULCH LEVELS                                                      | ANNUALLY                                                            | ANNUALLY                                        |
| <b>PLANTS</b>                                                            |                                                                     |                                                 |
| CHECK FOR AND REPORT PESTS & DISEASES                                    | FORTNIGHTLY                                                         | MONTHLY                                         |
| SPRAY IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS                  | FORTNIGHTLY                                                         | MONTHLY                                         |
| PRUNE DAMAGED OR DEAD BRANCHES                                           | FORTNIGHTLY                                                         | MONTHLY                                         |
| REMOVE WEED GROWTH IN PLANT AREAS                                        | FORTNIGHTLY                                                         | MONTHLY                                         |
| REPLACE FAILED OR DAMAGED PLANTS                                         | FORTNIGHTLY AS REQUIRED                                             | MONTHLY AS REQUIRED                             |
| ADJUST OR REPLACE STAKES AND TIES WHERE NECESSARY                        | FORTNIGHTLY AS REQUIRED                                             | MONTHLY AS REQUIRED                             |
| <b>GENERAL WATERING TO ALL STREET TREES</b>                              |                                                                     |                                                 |
| IRRIGATION BY WATER CART OR HOSECOCK AS REQUIRED TO MAINTAIN PLANT VIGOR | WEEKLY FIRST 6 MONTHS, FORTNIGHTLY THEREAFTER DEPENDENT ON RAINFALL | MONTHLY DEPENDENT ON RAINFALL CONDITIONS        |
| <b>URGENT WORKS</b>                                                      |                                                                     |                                                 |
| REPORT ANY THEFT, DAMAGE OR VANDALISM                                    | WEEKLY                                                              | AS REQUIRED                                     |



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**APPENDIX H – COMMUNITY CONSULTATION AND COMPLAINTS HANDLING PROCEDURE**

# COMMUNITY CONSULTATION AND COMPLAINTS HANDLING PROCEDURE

SSD-7500 – Construction, fit-out and operation of a warehouse and distribution uses, with ancillary offices  
5 and 9 Culverston Road, Minto

25 JANUARY 2022



## SSD-7500 – Construction, fit-out and operation of a warehouse and distribution uses, with ancillary offices, 5 and Culverston Road, Minto

### Community Consultation and Complaints Handling Procedure

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**Report No**

MINTO\_CHARTERHALL\_00001

**Date**

25/01/2022

**Revision Text**

B

## REVISIONS

| Revision | Date       | Description                     | Prepared by | Approved by |
|----------|------------|---------------------------------|-------------|-------------|
| A        | 24/01/2022 | Initial draft                   | PR          | JC          |
| B        | 25/01/2022 | Final draft for DPIE submission | PR          | JC          |

## KEY TERMS AND ACRONYMS

| Acronym/Term                     | Meaning                                                                                                                   |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| AS                               | Australian Standard                                                                                                       |
| CCCHP                            | Community Consultation and Complaints Handling Procedure                                                                  |
| CEMP                             | Construction Environmental Management Plan                                                                                |
| CoC                              | Conditions of Consent as detailed in the EP&A Act Development Consent SSD 7099                                            |
| Contractor's CM                  | Contractor's Construction Manager                                                                                         |
| Contractor's PM                  | Contractor's Project Manager                                                                                              |
| Council                          | Campbelltown City Council                                                                                                 |
| DPIE                             | Department of Planning, Industry and Environment                                                                          |
| EIS                              | Environmental Impact Statement                                                                                            |
| EMS                              | Environmental Management Systems                                                                                          |
| EPA Act                          | <i>Environmental Planning and Assessment Act 1979</i>                                                                     |
| EPA Regulation                   | <i>Environmental Planning and Assessment Regulation 2000</i>                                                              |
| EPA                              | Environment Protection Authority                                                                                          |
| Non-compliance                   | An occurrence, set of circumstances, or development that results in a non-compliance or is non-compliant with Development |
| OEH                              | Office of Environment and Heritage                                                                                        |
| Principal's Representative       | The Project Management Team and Environmental Specialists                                                                 |
| Project ('the')                  | The SSD-7500 for warehouse and distribution uses at 5 and 9 Culverston Road, Minto                                        |
| Project personnel                | All persons listed in Section 2.4 including sub-contractors working on the Project site.                                  |
| Project site / Project footprint | The subject of the SSD-7500 for warehouse and distribution uses at 5 and 9 Culverston Road, Minto                         |
| RtS                              | Response to Submissions                                                                                                   |
| SSD                              | State significant development                                                                                             |

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## 1 INTRODUCTION

On 23 June 2017, a State Significant Development ('SSD') Application was approved by the Minister for Planning under delegation for construction, fit-out and operation of a warehouse and logistics hub including four warehouse buildings for warehousing and distribution uses, with ancillary offices. This approval was subsequently modified on 16 December 2021 to change the layout staging and the warehouse size for three of the four warehouses. The modification was sought in response to market research and discussions with prospective tenants.

The construction of the warehouses will be delivered in stages, with ancillary car parking to be delivered with each stage.

This Community Consultation and Complaints Handling Procedure is specifically developed for the construction of Stages 1 and 2 of the approved development, including associated warehousing, office space, external storage and carparking.

### 1.1 Community Consultation and Complaints Handling Procedure Purpose and Context

As a condition of development consent for SSD-7500, A Construction Environmental Management Plan (CEMP) is to be developed (CoC C1) to support the construction of the warehouse and logistics hub. A number of sub-plans are to be developed to support the overarching CEMP, including a sub-plan for Community Consultation and Complaints Handling (CoC C2(g)).

Consultation was undertaken with key stakeholders both during the initial SSD application phase and the subsequent modification. Consultation was undertaken with the following groups:

- Campbelltown City Council
- Environment Protection Authority
- Office of Environment and Heritage (part of DPIE)
- Department of Primary Industries (part of DPIE)
- Department of Industry – Resources and Energy (part of DPIE)
- Transport for NSW
- Roads and Maritime Services (part of Transport for NSW)
- Local Residents
- Sydney Water
- Sydney Trains
- Endeavour Energy
- Transgrid
- WaterNSW

During the exhibition period for the EIS during the initial application, responses were received from a number of the organisations listed above, as well as Water NSW, Transgrid and Endeavour Energy.

### 1.2 Project Description

The site is approximately 29.63ha comprising regular allotments of land bound on four sides by Rose Payten Drive (South), Airds Road (West and North) and the Main Southern Railway (East). The site is also partially divided into Eastern and Western sections with a road running South from Airds Road through its centre, Culverston Road.

The proposal consists of two industrial facilities of varying sizes along the Western side with the Eastern side being proposed as external storage. The site layout addresses the necessity for a visually appealing streetscape, building form and orientation whilst also allowing for rational access and operational functionality for the intended users. This creates a compatible proposal that responds to the existing industrial context and supports a positive interaction with the streetscape. The promotion of safety and a high level of functionality and amenity are also key considerations in proposal.

Within the site, building layouts address the main street frontages including Rose Payten Drive, Airs Road, and Culverston Road and conceal loading areas within the site where possible. As an additional measure, landscape buffers have also been introduced to improve visual amenity.

The proposal will retain the use of the site for employment-generating purposes by facilitating the operation of the site for the storage and distribution of freight. Accordingly, the proposal will create employment opportunities and service businesses that operate on a local and national scale.

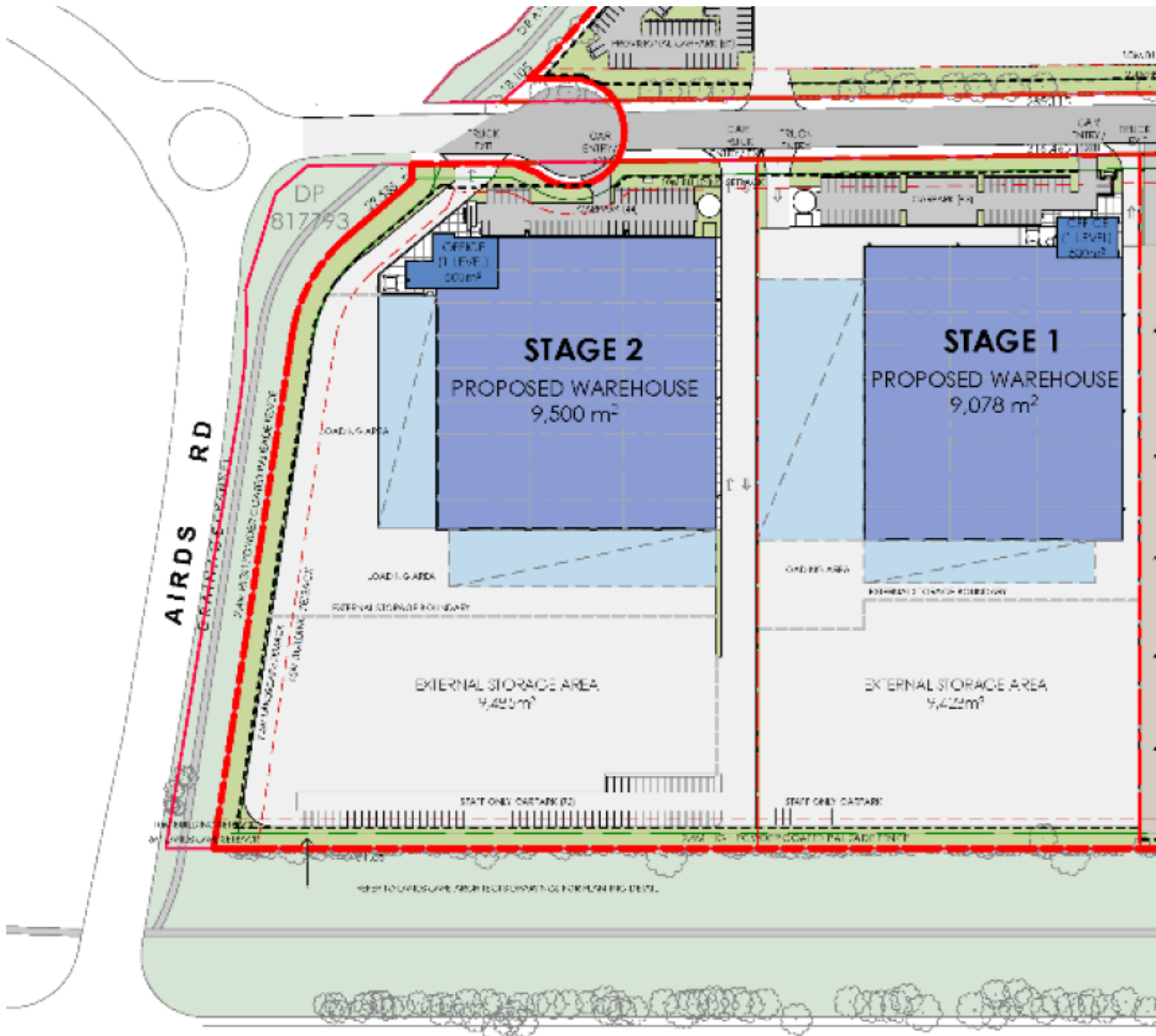


Figure 1-1 Site Location

## 1.2.1 Construction Activities

Construction of the Project is anticipated to be approximately 10 months. Construction works have been divided into delivery phases, specifically:

- Site Preparation
- Demolition and Bulk Earthworks
- Warehouse, External Storage and Carparking Construction



#### 1.2.1.1 Site Preparation

A summary of the Site Preparation activities includes, but are not limited to:

- Site surveying including, but not limited to, the installation of survey equipment such as survey controls, repeater stations, environmental monitoring equipment and construction monitoring equipment
- Property acquisition adjustments including installation of property fencing, and relocation and adjustments of utilities to property including water supply and electricity
- Relocation and connection of utilities
- Establishment of site buildings and structures including erosion and sediment controls
- Establishment of exclusion zones
- Installation of temporary construction compounds, including amenities and office for bulk earthworks.

#### 1.2.1.2 Demolition and Bulk Earthworks

Demolition, bulk earthworks, drainage and utility activities include, but not limited to:

- Demolition of existing buildings and structures, including offsite disposal of demolition waste
- Establishment of temporary stockpiling pads and associated temporary access roads
- Establishment of temporary batch plant sites and installation of batch plant if required
- Importation, stockpiling and placement of clean fill (bulk earthworks) and raising of the Project site to final level
- Importation, placement and compaction of engineered fill, which is comprised of virgin excavated natural material (VENM), excavated natural material (ENM) or other material approved in writing by the NSW Environment Protection Authority (EPA)
- Importation of construction materials
- Installation of erosion and sediment controls
- Installation of on-site detention basins
- Drainage and utilities installation.

#### 1.2.1.3 Warehousing, External Storage and Carparking Construction

Warehousing activities include, but not limited to:

##### **Construction and fit-out of warehousing**

- Establishment of construction compound, temporary fencing/ hoardings and temporary sediment and erosion control
- Installation of temporary site offices and amenities
- Excavation, foundation and floor slab installation
- Erection of framework and structural walls, including use of cranes
- Installation of roof, including use of cranes
- Internal fit out
- Landscaping
- Preparation of warehouse access road subgrade
- Forming of new kerbs, gutters, medians and other structures
- Placement of asphalt and concrete pavement
- New line marking, lighting and sign posting

## COMMUNITY CONSULTATION AND COMPLAINTS HANDLING PROCEDURE

- Removal of construction traffic management and opening of the internal road and warehouse access roads to traffic.

### **Miscellaneous structural construction and finishing works**

- Decommissioning/demobilisation of the construction area
- Commissioning of operational facilities
- Landscaping
- Rehabilitation of affected areas
- Post-construction condition surveys
- Post-construction site survey
- Removal of construction environmental controls
- Removal of construction ancillary facility related traffic signage
- Removal of construction traffic management and opening of new works to traffic.

## **1.2.2 Construction Hours**

In accordance with CoC B18, construction works will generally be undertaken during standard daytime construction working hours, being:

- 7:00 am to 6:00 pm Monday to Friday
- 8:00 am to 1:00 pm Saturday
- No works on Sunday or public holidays.

Construction outside of the hours nominated above may be undertaken in the following circumstances (CoC):

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

## 2 PLANNING AND MANAGEMENT FRAMEWORK

### 2.1 Legislative Requirements

There are some statutory provisions which set the requirements for community consultation during the construction phase of the development. These are outlined in the following sections.

#### 2.1.1 Environmental Planning and Assessment Act 1979

Community consultation provisions are included in the *Environmental Planning and Assessment Act 1979* (EPA Act). This includes:

- mandatory requirements for planning authorities in their planning functions, including minimum public exhibition periods and public notification periods
- the setting of regulations for State Significant Development, including consultation requirements
- regulations relating to community consultation by applicants for planning approvals

Schedule 1 – Community Participation Requirements, sets out minimum public exhibition periods for developments applications and other matters, provisions for public exhibition, mandatory notification requirements for applications and decisions and other general provisions.

The development application process for SSD 7500 followed mandatory community consultation requirements as set out in the Secretary's Environmental Assessment Requirements (SEARs). This included consultation with key stakeholders such as Campbelltown City Council and other relevant government authorities.

##### 2.1.1.1 Environmental Planning Assessment Regulation 2000

The *Environmental Planning and Assessment Regulation 2000* (EPA Regulation) further specifies requirements for public participation associated with State Significant Development (Divisions 5 and 6). This includes public notice associated with development applications, handling of public submissions and requirements for applicants to respond to public submissions. These provisions were met during the development application phase with the outcomes contributing to the Conditions of Consent for this SSD.

### 2.2 Development Approval

The Project has been approved under the EPA Act. There are conditions relevant to this Community Consultation and Complaints Handling Procedure in the Development Consent for the project (State Significant Development 7500). These are shown in Table 2-1 SSD7500 Development Consent – Community Consultation and Complaints Handling Procedure relevant conditions Table 2-1 below.

Table 2-1 SSD7500 Development Consent – Community Consultation and Complaints Handling Procedure relevant conditions

| CoC | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                | CCCHP Section |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| B23 | If Aboriginal objects are uncovered during earthworks, excavation or disturbance, work in the immediate area must stop and the Regional Operations Group of the OEH, Council and the Registered Aboriginal Parties are to be consulted.                                                                                                                                                                                                    | Section 3.2   |
| C2  | As part of the CEMP required under Condition C1 of this consent, the Applicant must append the following sub-management plans:<br>(a) Construction Traffic Management Plan (see Condition B1);<br>(b) Stormwater Management Plan (see Condition B11);<br>(c) Flood Response and Evacuation Plan (see Condition B13);<br>(d) Waste Management Plan (see Condition B30);<br>(e) Unexpected Contamination Finds Protocol (see Condition B38); | This document |

| CoC | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CCCHP Section                              |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
|     | (f) Landscape Management Plan (see Condition B44); and<br><b>(g) community consultation and complaints handling.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                            |
| C3  | The approved CEMP (as revised and approved by the Secretary from time to time) must be implemented by the Applicant for the duration of the construction works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Section 1 (Stages 1 and 2 of construction) |
| C7  | <p>The Applicant must ensure that the environmental management plans and sub-management plans required under conditions C1, C2 and C4 of this consent are prepared by a suitably qualified person or persons in accordance with best practice and include:</p> <ul style="list-style-type: none"> <li>(a) detailed baseline data;</li> <li>(b) a description of: <ul style="list-style-type: none"> <li>i. the relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> <li>ii. any relevant limits or performance measures/criteria; and</li> <li>iii. the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the Development or any management measures;</li> </ul> </li> <li>(c) a description of the management measures that would be implemented to comply with the relevant statutory requirements, limits or performance measures/criteria;</li> <li>(d) a program to monitor and report on the: <ul style="list-style-type: none"> <li>i. impacts and environmental performance of the Development; and</li> <li>ii. effectiveness of any management measures (see (c) above);</li> </ul> </li> <li>(e) a contingency plan to manage any unpredicted impacts and their consequences;</li> <li>(f) a program to investigate and implement ways to improve the environmental performance of the Development over time;</li> <li>(g) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>i. incidents;</li> <li>ii. complaints;</li> <li>iii. non-compliances with statutory requirements; and</li> <li>iv. exceedances of the impact assessment criteria and/or performance criteria;</li> </ul> </li> <li>and</li> <li>(h) a protocol for periodic review of the plan.</li> </ul> | This document                              |

## 2.3 Roles and Environmental Responsibilities

The implementation of Community Consultation and Complaints Handling Procedure will be conducted by a combination of Principal's Representative and the Construction Contractor during the course of construction. The Principal's Representative will be accountable for communications with regulators, including DPIE and EPA, and the media. The Construction Project Manager will be the position accountable for implementation of the complaints handling process. This means that complaints will be directed to the Construction Project Manager or their delegate. It will be the accountability of the Construction Project Manager to respond to complaints and to close these out in the complaints register. This function may be delegated to other project staff such as the HSE Coordinator or Project Coordinator.

## 2.4 Environmental Training and Competence

Requirements of construction staff under this procedure will be delivered during the project induction, as outlined in the CEMP. This will include details on community engagement activities and processes for responding to community complaints. Project staff will be advised that community complaints are to be directed through the approved processes and that complaints are not to be handled by general project staff.

A record of inductions and information discussed in toolbox talks will be recorded and filed in accordance with the CEMP.

## 2.5 Communication

Clear lines of communication throughout all levels and functions (e.g. management, staff and subcontractors), as well as to key external stakeholders, is key to minimising environmental impacts and achieving continual improvements in environmental performance.

### 2.5.1 External Communications

A number of key stakeholders have been identified in the development of this procedure. These including the following government agencies:

- Department of Planning, Industry and Environment (DPIE)
- Environment Protections Authority (EPA)
- Campbelltown City Council
- Office of Environment and Heritage (part of DPIE)
- Transport for NSW (TfNSW)
- Endeavour Energy
- Tharawal Local Aboriginal Land Council

Relevant contacts from each of these agencies will be kept by either the Principal's Representative or the Contractor Project Manager in the event they need to be contacted during the construction phase.

A number of properties were also identified during the EIS phase as being potentially subject to noise and air quality impacts during the construction phase of the project. These are identified as:

- 26 Kippax Avenue, Leumeah
- 42 Leicester Street, Leumeah
- 22 Kimberly Street, Leumeah
- 42 Kimberly Street, Leumeah
- 401 Pembroke Road, Minto
- 32 Collaroy Road, Woodbine
- 5 Soldiers Pl, Woodbine
- 28 Queenscliff Drive, Woodbine
- 38 Queenscliff Drive, Woodbine
- 7 Bungan Pl, Woodbine
- 19 Bungan Pl, Woodbine

The Principal's Representative will contact residents at the above-listed addresses prior to the commencement of construction to notify them that construction activities will be taking place.

### 3 IMPLEMENTATION

This section addresses the processes to be undertaken in consulting with the community and handling complaints.

#### 3.1 Pre-construction Consultation

As mentioned in Section 2.5.1, neighbouring residents will be contacted by the Principal's Representative prior to the commencement of construction. This will be provided in a letter direct to their residence, advising them of:

- commencement date of construction
- construction activities
- anticipated period of construction
- project contact details for further information or enquiries

The same information will be provided to Campbelltown City Council prior to the commencement of construction. This communication will be provided in an email to the relevant Council contact as well as phone call.

#### 3.2 Unexpected Archaeological Finds

For any unexpected find located during the course of construction, this will be reported to the Office of Environment and Heritage (OEH) section of DPIE. If the find is confirmed as an archaeological find in consultation with OEH, a representative of the Tharawal Local Aboriginal Land Council (LALC) will be contacted to inspect the find as well. A plan for the archaeological find will be consultatively established between OEH, LALC and the Principal's Representative.

#### 3.3 Complaints Management

During the construction Stages 1 and 2 of the development, the following complaints handling system will be maintained: The Construction Contractor has established a telephone number, postal address and email address for community complaints and enquiries. Details are provided below:

- 24-hour complaints telephone hotline: 0409 797 567
- Postal address for written complaints: 12.1/160 Bourke Road, Alexandria NSW 2015
- Email address for electronic complaints: [jcrameri@texco.net.au](mailto:jcrameri@texco.net.au)

##### 3.3.1 Complaint Register

All complaints are recorded in the Complaints Register including:

- The date and time, where relevant, of the complaint;
- The means by which the complaint was made (telephone, mail or email);
- Any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
- The nature of the complaint; and
- A record of any construction or meteorological conditions that may have potentially contributed to the complaint.



### 3.3.2 Complaint Assessment Procedure

Within two working days of a complaint being registered, an initial response is provided to the complainant and a preliminary assessment will commence to determine likely causes of the complaint using relevant available information (i.e. climatic conditions, environmental monitoring results and current operation activities). Information will be gathered from relevant construction activities to confirm the source of the complaints and share corrective actions

### 3.3.3 Complaint Management and Review

If following the preliminary assessment, the complaint is determined to be due to exceedance of Relevant Conditions of Consent, the Construction Project Manager will implement corrective actions as identified in Section 3.3.4.

The outcome of the complaints handling process is recorded in the Complaints Register, including:

- Any action(s) taken by the Construction Contractor in relation to the complaint, including any follow-up contact with the complainant; and
- If no action was taken by the Construction Contractor in relation to the complaint, the reason(s) why no action was taken.

Every effort is made to ensure that concerns are addressed in a manner that results in a mutually acceptable outcome.

### 3.3.4 Corrective Action

If corrective actions are identified as a result of investigations into a community complaint, the Construction Project Manager will determine appropriate management strategies and implementation of contingency measures in consultation with the Principal's Representative. This same process is applied as an outcome of management review in the CEMP. This process will be implemented in accordance with the Environmental Management System – Improvement Notice (EHS – 9.16) and Non-conformance Register (EHS – 1.1.05).

## 4 MONITOR AND REVIEW

### 4.1 Environmental Auditing

#### 4.1.1 Internal Audits

Internal audits will be undertaken by the Principal's representative of the Construction Contractor at least 3-monthly. This will ensure that the Construction Contractor is undertaking works in compliance with the development consent and other statutory requirements. This includes conditions of consent and relevant management plans, including this Community Consultation and Complaints Handling Procedure.

### 4.2 Non-compliance and Actions

#### 4.2.1 Non-compliances

Any non-compliance with the CoC, including those that relate to this Community Consultation and Complaints Handling Procedure, shall be investigated to determine the root cause and any corrective and/or preventative actions arising. This will be reported to the Principal's Representative in a Non-Conformance/NCR and any corrective and/or preventative actions will be recorded within the Project Corrective Actions Register to be developed by the Construction Contractor and handled in accordance with the Environmental Management System – Improvement Notice (EHS – 9.16) and Non-conformance Register (EHS – 1.1.05).

#### 4.2.2 Corrective and Preventative Actions Register

Corrective and preventative actions will be logged into a register which will be used to verify the close out of an NCR. Additionally, the register will also be used to identify opportunities for improvement.

The nominated timeframes to resolve corrective actions are detailed in Table 4-1.

Table 4-1 Corrective Actions Timeframe for Resolution

| Risk Ranking | Timeframe                                                     |
|--------------|---------------------------------------------------------------|
| 1            | Action needs to be commenced immediately to resolve the issue |
| 2            | Action needs to be resolved within 1 week                     |
| 3            | Action needs to be resolved within 1 month                    |

Trends relating to environmental incidents or non-compliance findings will be reviewed at the Construction Contractor's Management Team meetings to identify any recurring or systemic issues that are indicative of the need to take preventative action.

### 4.3 Management Review

The Contractor's Management Team and Principal's Representative will review the adequacy of all CEMP provisions, including this procedure, as well as the effectiveness of their implementation to determine whether they are still applicable to the activities being carried out on site.

The management review will be minuted. Any changes to the plan will be made by the Principal's Representative and submitted for approval to DPIE.

## REFERENCES

Compliance with relevant legislation and industry best practice is often achieved through the adherence to relevant guidelines and standards. Guidelines and standards used during the compilation of the CCCHP include those detailed below.

Where updated or revised versions of guidelines, protocols, Standards or policies, or a replacement of them are available, the most recent versions should be applicable to this Plan.

### Standards

- AS/ISO 10002 - Customer Satisfaction – Guidelines for Complaints handling in Organisations
- AS/NZS ISO 14001 - Environmental Management Systems

### Guidelines

- Community Consultative Committee Guidelines: State Significant Projects (2019)
- Guideline for the Preparation of Environmental Management Plans (DIPNR 2004)

## APPENDIX I – NOISE & VIBRATION



# 5 & 9 Culverston Road, Minto

## SSD-7500

### Construction Noise and Vibration Management Sub-Plan (CNVMSP)

**Texco Constructions Pty Ltd**

Suite 2, 1 Hall Street,  
Hawthorn East VIC 3123

Report number: 210626 - 5 & 9 Culverston Road, Minto - CNVMP - R1.docx

Date: 13 January 2022

Version: R1 - For Information

## DOCUMENT CONTROL

|                         |                                                         |
|-------------------------|---------------------------------------------------------|
| <b>Project Name</b>     | 5 & 9 Culverston Road, Minto                            |
| <b>Project Number</b>   | 210626                                                  |
| <b>Report Reference</b> | 210626 - 5 & 9 Culverston Road, Minto - CNVMP - R1.docx |
| <b>Client:</b>          | Texco Constructions Pty Ltd                             |

| Revision | Description     | Reference                                               | Date                           | Prepared        | Checked   | Authorised |
|----------|-----------------|---------------------------------------------------------|--------------------------------|-----------------|-----------|------------|
| 1        | For Information | 210626 - 5 & 9 Culverston Road, Minto - CNVMP - R1.docx | 30 <sup>th</sup> December 2021 | Matthew Furlong | Ben White | Ben White  |

### PREPARED BY:

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This report has been prepared by Pulse White Noise Acoustics Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Texco Constructions Pty Ltd. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Texco Constructions Pty Ltd  
No warranties or guarantees are expressed or should be inferred by any third parties.  
This report may not be relied upon by other parties without written consent from Pulse White Noise Acoustics.  
This report remains the property of Pulse White Noise Acoustics Pty Ltd until paid for in full by the client, Texco Constructions Pty Ltd.

**Pulse White Noise Acoustics disclaims any responsibility to the Texco Constructions Pty Ltd and others in respect of any matters outside the agreed scope of the work.**



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## 1 INTRODUCTION

Pulse White Noise Acoustics (PWNA) has been engaged by Texco Constructions Pty Ltd to prepare a Construction Noise and Vibration Management Sub-Plan (CNVMSP) for the construction of two new warehouses and associated landscaping/hardstand areas at 5 and 9 Culverston Road, Minto NSW.

This CNVMSP has been prepared to satisfy the requirements of Condition B20 of the consent given in the *Development Consent* issued for Development Application No. SSD-7500, dated 23<sup>rd</sup> June 2017 (Mod).

Onsite unattended noise levels have previously been determined for the project by Wilkinson Murray in the site's *Noise and Vibration Impact Assessment* submitted as part of the SSD Application reference "*Minto Warehousing & Logistics Hub Noise and Vibration Impact Assessment*", dated April 2016. These levels are adopted for this assessment.

A glossary of acoustic terminology used throughout this report is included in Appendix A.

### 1.1 Environment Management Plan Checklist

As per Appendix A of the NSW Government's Environment Management Plan guideline the following preparation checklist has been populated.

**Table 1 EMP Preparation Checklist**

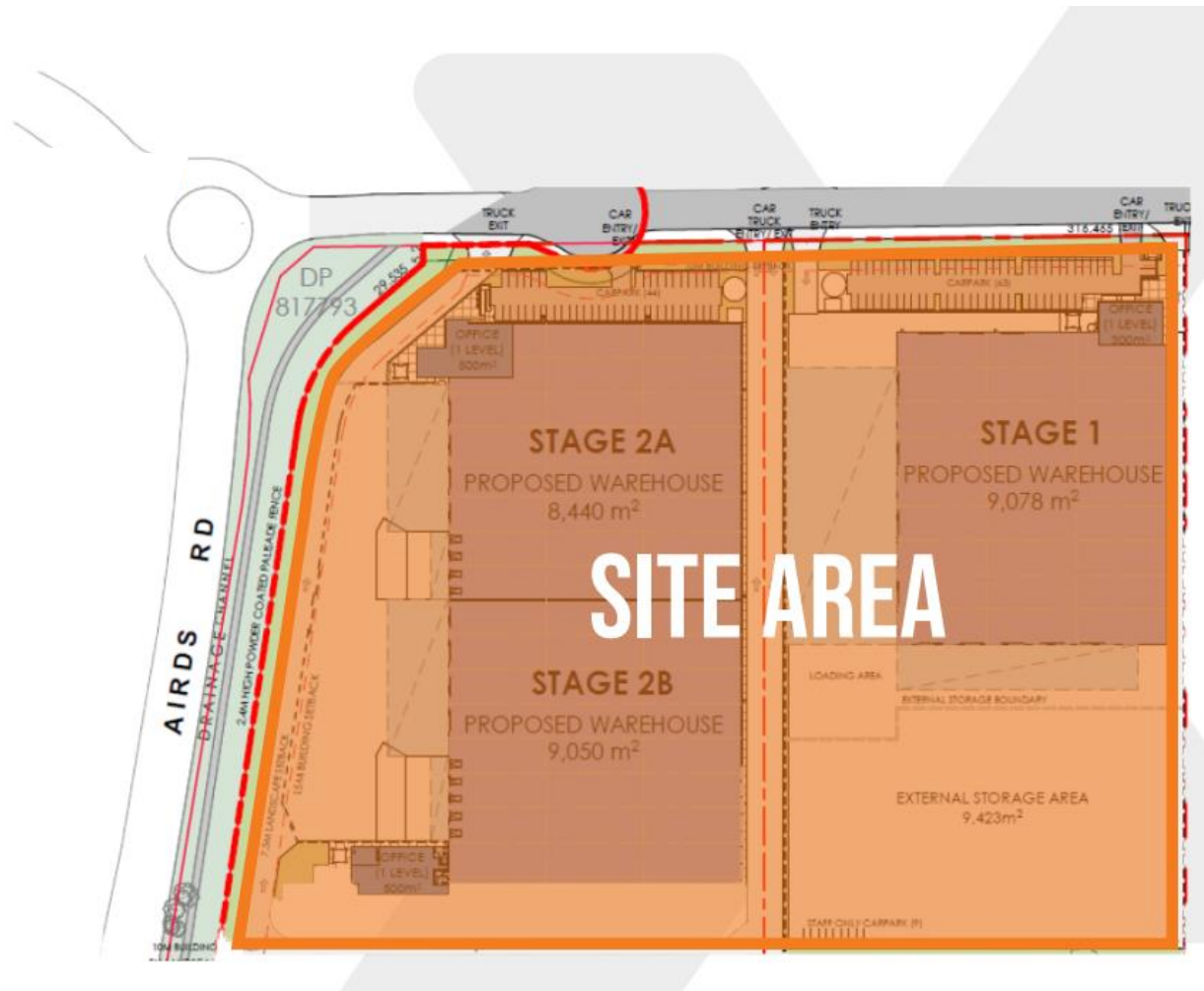
| Requirement                                                                                                                                                                                              | Plan Reference            | Yes/ No/ Not Applicable |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------|
| <b>Document preparation and endorsement</b>                                                                                                                                                              |                           |                         |
| Has the EMP been prepared in consultation with all relevant stakeholders as per the requirements of the conditions of consent? (Section 4.1)                                                             | -                         | Not Applicable          |
| Have the views of the relevant stakeholders been taken into consideration? Have appropriate amendments been made to the EMP and does the EMP clearly identify the location of any changes? (Section 4.1) | -                         | Not Applicable          |
| Has the EMP been internally approved by an authorised representative of the proponent or contractor? (Section 4.2)                                                                                       | As per contractors advice | Yes                     |
| <b>Version and Content</b>                                                                                                                                                                               |                           |                         |
| Does the EMP describe the proponent's Environmental Management System (EMS) (if any), and identify how the EMP relates to other documents required by the conditions of consent? (Section 3.5.1)         | -                         | Not Applicable          |
| Does the EMP include the required general content and version control information? (Section 3.1)                                                                                                         | Refer to section 5        | Yes                     |
| Does the EMP have an introduction that describes the project, scope of works, site location and any staging or timing considerations? (Section 3.2)                                                      | Refer to section 1        | Yes                     |
| Does the EMP reference the project description? (Section 3.3)                                                                                                                                            | Refer to section 1        | Yes                     |
| Does the EMP reference a Community and Stakeholder Engagement Plan (or similar) or include community and stakeholder engagement actions (if required)? (Section 3.4)                                     | -                         | Not Applicable          |
| Have all other relevant approvals been identified? Has appropriate information been provided regarding how each approval is relevant? (Section 4)                                                        | Refer to section 3        | Yes                     |
| Has the environmental management structure and responsibilities been included? (Section 3.5.2)                                                                                                           | -                         | Not Applicable          |

|                                                                                                                                                                                          |                                                                   |                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------|
| Does the EMP include processes for training of project personnel and identify how training and awareness needs will be identified? (Section 3.5.3)                                       | -                                                                 | Not Applicable |
| Does the EMP clearly identify the relevant legal and compliance requirements that relate to the EMP? (Section 3.5.3)                                                                     | Refer to section 3                                                | Yes            |
| Does the EMP include all the conditions of consent to be addressed by the EMP and identify where in the EMP each requirement has been addressed? (Section 3.5.13)                        | Refer to section 3                                                | Yes            |
| Have all relevant guidelines, policies and standards been identified, including details of how they are relevant? (Section 3.5)                                                          | Refer to section 3                                                | Yes            |
| Is the process that will be adopted to identify and analyse the environmental risks included? (Section 3.5.5)                                                                            | Refer to section 5                                                | Yes            |
| Have all the environmental management measures in the EIA been directly reproduced into the EMP? (Section 3.5.7)                                                                         | Refer to section 3                                                | Yes            |
| Have any additional environmental management measures been included in the EMP? (Section 3.5.7)                                                                                          | Refer to section 5                                                | Yes            |
| Have environmental management measures been written in committed language? (Section 3.5.7)                                                                                               | -                                                                 | Not Applicable |
| Have project environmental management measures, including hold points, been identified and included? (Section 3.5.6)                                                                     | -                                                                 | Not Applicable |
| Are relevant details of environmental monitoring that will be carried out included? (Section 3.5.8)                                                                                      | -                                                                 | Not Applicable |
| Have the components of any environmental monitoring programs been incorporated? (Section 3.5.8)                                                                                          | -                                                                 | Not Applicable |
| Are environmental inspections included? (Section 3.5.9)                                                                                                                                  | -                                                                 | Not Applicable |
| Does the EMP document all relevant compliance monitoring and reporting requirements for the project? (Section 3.5.12 and 3.5.13)                                                         | -                                                                 | Not Applicable |
| Does the EMP describe the types of plans or maps (such as environmental control maps) that will be used to assist with the management of environmental matters on site? (Section 3.5.10) | -                                                                 | Not Applicable |
| Does the EMP list environmental management documents? (Section 3.5.11)                                                                                                                   | -                                                                 | Not Applicable |
| Is an auditing program referenced? (Section 3.5.13)                                                                                                                                      | -                                                                 | Not Applicable |
| Does the EMP include the incident notification and reporting protocols that comply with the relevant conditions of consent? (Section 3.5.15)                                             | Refer to section 5.5<br><b>Error! Reference source not found.</b> | Yes            |
| Does the EMP identify the project role/position that is responsible for deciding whether an occurrence is an incident? (Section 3.5.15)                                                  | Refer to section 5                                                | Yes            |
| Does the EMP describe a corrective and preventative action process that addresses the requirements? (Section 3.5.16)                                                                     | Refer to section 5                                                | Yes            |
| Does the EMP include details of a review and revision process that complies with the requirements? (Section 3.6)                                                                         | -                                                                 | Not Applicable |

## 1.2 Development Overview

The approved development is for construction and operation of two (2) warehouses with associated external hardstand/storage areas, carparking, landscaping and site infrastructure upgrades.

**Figure 1 Architectural Site Plan**



### 1.3 Site Layout

The site is located at 5 and 9 Culverston Road, Minto, in the local government area of Campbelltown City Council. The site is formally described as Lot 3 DP817793 and Lot 400 DP875711 (refer to Figure 2 below). The site is irregular in shape which wraps around Culverston Road on three sides and has a combined site area of 29.63 Hectares.

The site is bounded by roadways, rail corridors and existing industrial with the nearest residential receiver 300m to the west and 450m to the southeast.

Located along the northern boundary of the site is part of Airs Road and existing industrial developments. Airs Road is the sub arterial road which Culverston Road (site access) is connected too. Further north is existing industrial developments.

Situated along the eastern boundary of the site is the Main Southern Railway which carries a combination of freight and passenger trains. Located immediately opposite the rail corridor is existing industrial developments which residential further east. Approximately 450-500m east.

Along the southern boundary of the site is Rose Payten Drive with existing carparking and sporting facilities located further south.

Located along the western boundary of the site is the Bow Bowling Creek with the remainder of Airs Road located further west.

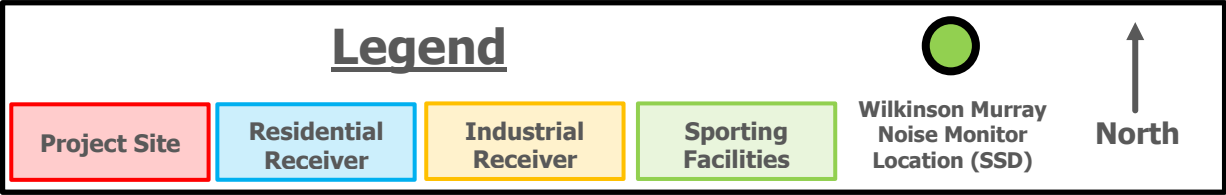
The nearest sensitive receivers to the site are identified below.

- Receiver 1:** Residential dwellings located to the east of the site across the Rail Corridor and Pembroke Road. Receivers are located along the eastern side of Pembroke Street. Receiver one will be known as Pembroke Road Receivers in this report.
- Receiver 2:** Residential dwellings located to the west of the site across Airs Road and Campbelltown Road. Receivers are located along the western side of Campbelltown Road. Receiver two will be known as Campbelltown Road Receivers in this report.
- Receiver 3:** Industrial developments along the northern boundary of the site. Receiver three will be known as Northern Industrial in this report.
- Receiver 4:** Industrial developments to the east of the site across the Main Southern Railway. Receiver four will be known as Eastern Industrial in this report.
- Receiver 5:** Industrial developments to the west of the site across the Ben Bowling Creek. Receiver five will be known as Western Industrial in this report.
- Receiver 6:** Campbelltown Sporting facilities (i.e., Football, Tennis, Athletics) located to the south of the site across Rose Payten Drive. Receiver six will be known as Campbelltown Sports Facilities in this report.

A map showing the site location as well as nearest receivers is provided in Figure 2 below. This figure also shows the location of onsite unattended measurements which were conducted as part of this assessment.



Figure 2 Site Map, Measurement Locations and Surrounding Receivers – Sourced from SixMaps



## 2 EXISTING ACOUSTIC ENVIRONMENT

Measured noise levels from the onsite unattended noise survey are outlined below. These are adopted from the Wilkinson Murray Noise and Vibration Impact Assessment submitted as part of the project approval phase. See below.

**Figure 3 Wilkinson Murray – Existing Noise Environment (Acoustic Survey) – Part 1**

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### 3 EXISTING NOISE ENVIRONMENT

#### 3.1 Surrounding Environment

The environment immediately surrounding the project site is occupied by existing or developing industrial premises. The nearest residential communities to the proposed WH&LH are Woodbine, located approximately 300 m to the west and Leumeah / Minto, approximately 500 m to the east. The noise environment is generally controlled by noise emissions from road traffic on the surrounding road network.

In terms of surrounding receivers, there are two noise environments to be characterised:

- Residential receivers in Woodbine – separated from the industrial area by Campbelltown Road.
- Residential receivers in Leumeah/Minto – separated from the industrial area by Pembroke Road.

#### 3.2 Ambient Noise Survey

In order to establish the existing ambient noise environment of the area, unattended environmental noise monitoring was conducted at two (2) locations between Wednesday 2 March 2016 and Wednesday 9 March 2016.

The instrumentation used for the survey consisted of two (2) Acoustic Research Laboratories (ARL) Environmental Noise Loggers Type EL-215 (serial number 194449 - Location 1 and serial number 194637 - Location 2) both fitted with microphone windshields. Calibration of the loggers was checked prior to and following measurements. Drift in calibration did not exceed  $\pm 0.5$  dBA. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

The selected monitoring locations, which are shown in Figure 2-2, were:

- **Location 1 (Woodbine Residential Area):** The logger was located in the rear yard of the residential property at 19 Bungan Place, Woodbine to establish the ambient noise environment at residential receivers on the western side of the industrial area.
- **Location 2 (Leumeah/Minto Area):** The logger was located in the rear yard of the residential property at 22 Kimberley Street, Leumeah to establish the ambient noise environment at residential receivers on the eastern side of the industrial area.

Both measurement locations were primarily dictated by accessibility and security issues for the instrumentation.

The measured data was processed according to the NSW EPA's *Industrial Noise Policy* (INP) assessment time periods.

Table 3-1 details the RBL (background) and  $L_{Aeq}$  noise levels recorded during the daytime, evening and night time periods. Data affected by adverse meteorological conditions was removed from the data prior to processing.

## Figure 4 Wilkinson Murray – Existing Noise Environment (Acoustic Survey) – Part 2

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**Table 3-1 Measured Ambient Noise Levels Corresponding to NSW INP Assessment Time Periods**

| Logger Location | Noise Level – dBA re 20 µPa |                               |                       |                  |                          |                  |
|-----------------|-----------------------------|-------------------------------|-----------------------|------------------|--------------------------|------------------|
|                 | Daytime<br>7am – 6pm        |                               | Evening<br>6pm – 10pm |                  | Night Time<br>10pm – 7am |                  |
|                 | RBL <sup>1</sup>            | L <sub>Aeq</sub> <sup>2</sup> | RBL                   | L <sub>Aeq</sub> | RBL                      | L <sub>Aeq</sub> |
| Location 1      | 54                          | 62                            | 52                    | 61               | 43                       | 60               |
| Location 2      | 48                          | 58                            | 46                    | 57               | 40                       | 53               |

Note 1: The RBL noise level is representative of the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

Note 2: The L<sub>Aeq</sub> is essentially the average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

### 3.3 Discussion of Results

The ambient noise survey results reflect a noise environment principally dominated by traffic on surrounding roads, general urban activities and other environmental noise sources (birds, insects, aircraft, community activity etc). The measurements show daytime background L<sub>A90</sub> noise levels generally ranging between 49 dBA and 56 dBA at receivers on the western side of Campbelltown Road and between 44 dBA and 50 dBA at the residential area to the east of Pembroke Road.

No significant shift in levels was observed during the evening period, due to the influence of road traffic.

During the night time period (ie. between 10.00 pm and 7.00 am), background L<sub>A90</sub> noise levels fell to 43 dBA and 40 dBA at the western and eastern residential areas, respectively.



### 3 NOISE AND VIBRATION CRITERIA

Relevant noise and vibration criteria for construction activities are detailed below.

#### 3.1 SSD-7500 Development Consent – Schedule 1 Conditions

Conditions of the consent which relate to construction noise and or vibration are detailed below.

Condition B18:

- B18. The Applicant must comply with the hours detailed in ~~Table 4~~ **Table 2** unless otherwise agreed in writing by the Secretary.

~~Table 4~~ **Table 2: Hours of Work**

| Activity                    | Day             | Time         |
|-----------------------------|-----------------|--------------|
| Earthworks and construction | Monday – Friday | 7 am to 6 pm |
|                             | Saturday        | 8 am to 1 pm |
| Operation                   | Monday – Sunday | 24 hours     |

Condition B19:

- B19. Construction works outside of the construction hours identified in Condition B18 may be undertaken in the following circumstances:
- (a) works that are inaudible at the nearest sensitive receivers;
  - (b) works agreed to in writing by the Secretary;
  - (c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
  - (d) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Condition B20:

##### Construction Noise Limits

- B20. The Development must be constructed to achieve the construction noise management levels detailed in the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009). All feasible and reasonable noise mitigation measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the management and mitigation measures in the EIS.

**Note:** *The Interim Construction Noise Guideline identifies 'particularly annoying' activities that require the addition of 5dB(A) to the predicted level before comparing to the construction NML.*

Condition B22:

##### Noise Management

- B22. The Applicant must:
- (a) implement best management practice, including all reasonable and feasible measures to prevent and minimise noise and vibration during construction and operation of the Development (including low frequency noise and traffic noise);
  - (b) minimise the noise impacts of the Development during adverse meteorological conditions when noise criteria do not apply;
  - (c) maintain the effectiveness of any noise suppression equipment on plant at all times and ensure defective plant is not used operationally until fully repaired; and
  - (d) regularly assess noise monitoring data and relocate, modify and/or stop operations to ensure compliance with the relevant conditions of this consent.

## 3.2 Construction Noise Criteria

### 3.2.1 NSW EPA Interim Construction Noise Guideline (ICNG) – DECC 2009

Noise criteria for construction and demolition activities are discussed in the *Interim Construction Noise Guideline* (ICNG). The ICNG also recommends procedures to address potential impacts of construction noise on residences and other sensitive land uses. The main objectives of the ICNG are summarised as follows:

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

The ICNG contains a quantitative assessment method which is applicable to this project. Guidance levels are given for airborne noise at residences and other sensitive land uses.

The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with the Noise Management Levels (NMLs). The NML affectation categories for residential receivers have been reproduced from the guideline and are listed in the table below.

**Table 2 NMLs for quantitative assessment at residences**

| Time of Day                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Noise Management Level<br>$L_{Aeq}(15\text{minute})^{1,2}$ | How to Apply                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended standard hours:<br>Monday to Friday<br>7 am to 6 pm<br>Saturday 8 am to 1 pm<br>No work on Sundays or public holidays                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>"Noise Affected Level"</b><br>RBL + 10 dB               | The noise affected level represents the point above which there may be some community reaction to noise. <ul style="list-style-type: none"> <li>Where the predicted or measured <math>L_{Aeq}(15\text{minute})</math> is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level.</li> <li>The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</li> </ul>                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>"Highly Noise Affected Level"</b><br>75 dBA             | The highly noise affected level represents the point above which there may be strong community reaction to noise. <ul style="list-style-type: none"> <li>Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: <ol style="list-style-type: none"> <li>Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences.</li> <li>If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.</li> </ol> </li> </ul> |
| Outside recommended standard hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Noise affected<br>RBL + 5 dB                               | <ul style="list-style-type: none"> <li>A strong justification would typically be required for works outside the recommended standard hours.</li> <li>The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</li> <li>Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.</li> </ul>                                                                                                                                                                                                                                                                                                           |
| <p><i>Note 1 Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.</i></p> <p><i>Note 2 The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Noise Policy for Industry (EPA 2017).</i></p> <p><i>Note 3 Requirements listed in the table above are in accordance with the Construction Hours listed in Condition C4 and C5.</i></p> |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Construction noise levels at other noise receivers are outlined below:

- Construction noise levels at offices, retail outlets is not to exceed 70dB  $L_{Aeq},15\text{minute}$ , when measured externally.
- Construction noise levels at industrial premises is not to exceed 75dB  $L_{Aeq},15\text{minute}$ , when measured externally.



Based on the measured background noise levels summarised in section 2, and the NMLs outlined above the construction noise criteria to be used in this assessment are listed in below.

**Table 3 NMLs as basis for the acoustic assessment**

| Receiver Types                                    |            | NML, dB LAeq(15minute)                                                                   |                                                                  |           |
|---------------------------------------------------|------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------|
|                                                   |            | Standard Hours<br>Monday to Friday:<br>7:00am to 6:00pm<br>Saturday:<br>8:00am to 1:00pm | Outside Standard Hours<br>6:00pm to 10:00pm<br>10:00pm to 7:00am |           |
| Residences<br>(Measured externally)               | Receiver 1 | <b>64</b> + HNAL = 75                                                                    | <b>57</b>                                                        | <b>48</b> |
|                                                   | Receiver 2 | <b>58</b> + HNAL = 75                                                                    | <b>51</b>                                                        | <b>45</b> |
| Offices & retail outlets<br>(Measured externally) |            |                                                                                          | <b>70</b>                                                        |           |
| Industrial premises<br>(Measured externally)      |            |                                                                                          | <b>75</b>                                                        |           |

### 3.2.2 Construction Traffic Noise Criteria

For existing residences and other sensitive land uses affected by additional traffic on existing roads, the NSW *Road Noise Policy (RNP)* states that for noise associated with increased road traffic generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB during both day and night-time periods. An increase of 2 dB represents a minor impact that is considered barely perceptible to the average person.

### 3.3 Vibration Criteria

Effects of ground borne vibration on buildings may be segregated into the following three categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed. Refer to further discussion in Section 3.3.1.
- Effects on building contents – where vibration can cause damage to fixtures, fittings and other non-building related objects. Refer to further discussion in Section 3.3.2.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself. Refer to further discussion in Section 3.3.2.

#### 3.3.1 Vibration Criteria – Human Comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled *"Assessing Vibration – A Technical Guideline"*. (AVTG) This type of impact can be further categorised and assessed using the appropriate criterion as follows:

- Continuous vibration – from uninterrupted sources (refer to Table 4).
- Impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (refer to Table 5).
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (refer to Table 6).

**Table 4 Continuous vibration acceleration criteria (m/s<sup>2</sup>) 1 Hz-80 Hz**

| Location                                                         | Assessment period | Preferred Values |               | Maximum Values |               |
|------------------------------------------------------------------|-------------------|------------------|---------------|----------------|---------------|
|                                                                  |                   | z-axis           | x- and y-axis | z-axis         | x- and y-axis |
| Residences                                                       | Daytime           | 0.010            | 0.0071        | 0.020          | 0.014         |
|                                                                  | Night-time        | 0.007            | 0.005         | 0.014          | 0.010         |
| Offices, schools, educational institutions and places of worship | Day or night-time | 0.020            | 0.014         | 0.040          | 0.028         |
|                                                                  |                   | 0.04             | 0.029         | 0.080          | 0.058         |
| Workshops                                                        | Day or night-time | 0.04             | 0.029         | 0.080          | 0.058         |

**Table 5 Impulsive vibration acceleration criteria (m/s<sup>2</sup>) 1 Hz-80 Hz**

| Location                                                         | Assessment period | Preferred Values |               | Maximum Values |               |
|------------------------------------------------------------------|-------------------|------------------|---------------|----------------|---------------|
|                                                                  |                   | z-axis           | x- and y-axis | z-axis         | x- and y-axis |
| Residences                                                       | Daytime           | 0.30             | 0.21          | 0.60           | 0.42          |
|                                                                  | Night-time        | 0.10             | 0.071         | 0.20           | 0.14          |
| Offices, schools, educational institutions and places of worship | Day or night-time | 0.64             | 0.46          | 1.28           | 0.92          |
| Workshops                                                        | Day or night-time | 0.64             | 0.46          | 1.28           | 0.92          |

**Table 6 Intermittent vibration impacts criteria (m/s<sup>1.75</sup>) 1 Hz-80 Hz**

| Location                                                         | Daytime          |                | Night-time       |                |
|------------------------------------------------------------------|------------------|----------------|------------------|----------------|
|                                                                  | Preferred Values | Maximum Values | Preferred Values | Maximum Values |
| Residences                                                       | 0.20             | 0.40           | 0.13             | 0.26           |
| Offices, schools, educational institutions and places of worship | 0.40             | 0.80           | 0.40             | 0.80           |
| Workshops                                                        | 0.80             | 1.60           | 0.80             | 1.60           |

### 3.3.2 Vibration Criteria – Building Contents and Structure

The vibration effects on the building itself are assessed against international standards as follows:

- For transient vibration: British Standard BS 7385: Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration" (BSI 1993); and
- For continuous or repetitive vibration: German DIN 4150: Part 3 – 1999 "Effects of Vibration on Structure" (DIN 1999).

#### Standard BS 7385 Part 2 - 1993

For transient vibration, as discussed in standard BS 7385 Part 2-1993, the criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised in Table 7 and illustrated in Figure 5.

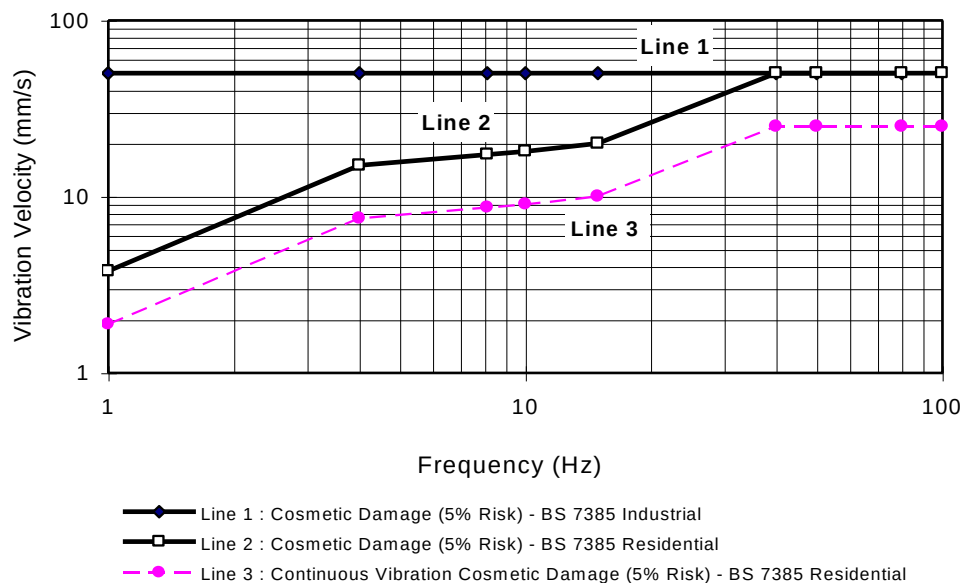
**Table 7 Transient vibration criteria as per standard BS 7385 Part 2 - 1993**

| Line in Figure 5 | Type of Building                                                                          | Peak Component Particle Velocity in Frequency Range of Predominant Pulse |                                                           |
|------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------|
|                  |                                                                                           | 4 Hz to 15 Hz                                                            | 15 Hz and Above                                           |
| 1                | Reinforced or framed structures<br>Industrial and heavy commercial buildings              | 50 mm/s at 4 Hz and above                                                |                                                           |
| 2                | Unreinforced or light framed structures<br>Residential or light commercial type buildings | 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz                           | 20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above |

Standard BS 7385 Part 2 – 1993 states that the values in Table 7 relate to transient vibration which does not cause resonant responses in buildings.

Where the dynamic loading caused by continuous vibration events is such as that results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 7 may need to be reduced by up to 50% (refer to Line 3 in Figure 5).

**Figure 5 BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage**



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

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 7, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 7 should not be reduced for fatigue considerations.

### Standard DIN 4150 Part 3 - 1999

For continuous or repetitive vibration, standard DIN 4150 Part 3-1999 provides criteria based on values for peak particle velocity (mm/s) measured at the foundation of the building; these are summarised in Table 8. The criteria are frequency dependent and specific to particular categories of structures.

**Table 8 Structural damage criteria as per standard DIN 4150 Part 3 - 1999**

| Type of Structure                                                                                                                                                                                    | Peak Component Particle Velocity, mm/s                      |                |                              | Vibration of horizontal plane of highest floor at all frequencies |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------|------------------------------|-------------------------------------------------------------------|
|                                                                                                                                                                                                      | Vibration at the foundation at a frequency of 1 Hz to 10 Hz | 10 Hz to 50 Hz | 50 Hz to 100 Hz <sup>1</sup> |                                                                   |
| Buildings used for commercial purposes, industrial buildings and buildings of similar design                                                                                                         | 20                                                          | 20 to 40       | 40 to 50                     | 40                                                                |
| Dwellings and buildings of similar design and/or use                                                                                                                                                 | 5                                                           | 5 to 15        | 15 to 20                     | 15                                                                |
| Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order) | 3                                                           | 3 to 8         | 8 to 10                      | 8                                                                 |
| <i>Note 1: For frequencies above 100Hz, at least the values specified in this column shall be applied.</i>                                                                                           |                                                             |                |                              |                                                                   |

### 3.4 Ground-Borne Noise Criteria

According to the NSW EPA *Interim Construction Noise Guideline* (ICNG) 2009, the criteria for ground-borne noise at residences is defined as follows:

- Maximum internal noise levels of 40 dB LAeq(15mins) between 6:00pm and 10:00pm.

It is noted that the ground borne criteria will apply for construction works undertaken outside of standard hours. That is, work conducted during the evening period Monday to Friday between 6:00pm and 7:00pm only.

## 4 NOISE AND VIBRATION ASSESSMENT

### 4.1 Construction Noise Assessment

Sound power levels have been predicted for the construction tasks identified in the project program. The equipment anticipated for use in each task is based on previous project experience. The sound power levels for the equipment likely to be used for each of the listed tasks are provided in Table 9 below.

**Table 9 Summary of predicted sound power levels**

| Tasks                     | Equipment                         | Sound Power Levels (dBA re 1pW) | Aggregate Sound Power Level per Task (dBA re 1pW) |
|---------------------------|-----------------------------------|---------------------------------|---------------------------------------------------|
| Site Establishment Works  | Mobile crane                      | 110                             | 113                                               |
|                           | Power hand tools                  | 109                             |                                                   |
|                           | Semi Rigid Vehicle <sup>1</sup>   | 105                             |                                                   |
| Ground Works              | Excavator                         | 112                             | 120                                               |
|                           | Hydraulic Hammer                  | 118                             |                                                   |
|                           | Piling Rig                        | 110                             |                                                   |
|                           | Handheld jack hammer <sup>1</sup> | 111                             |                                                   |
|                           | Dump truck <sup>1</sup>           | 104                             |                                                   |
|                           | Concrete saw <sup>1</sup>         | 114                             |                                                   |
|                           | Skid steer                        | 110                             |                                                   |
|                           | Power hand tools                  | 109                             |                                                   |
| Structure                 | Handheld jack hammer <sup>1</sup> | 106                             | 117                                               |
|                           | Concrete saw <sup>1</sup>         | 114                             |                                                   |
|                           | Power hand tools                  | 109                             |                                                   |
|                           | Welder                            | 101                             |                                                   |
|                           | Concrete pump truck               | 110                             |                                                   |
|                           | Concrete agitator truck           | 108                             |                                                   |
| Internal Works            | Power hand tools                  | 109                             | 109                                               |
| Common and External Works | Concrete agitator truck           | 108                             | 114                                               |
|                           | Saw cutter <sup>1</sup>           | 104                             |                                                   |
|                           | Dump truck <sup>1</sup>           | 104                             |                                                   |
|                           | Concrete saw <sup>1</sup>         | 114                             |                                                   |
|                           | Power hand tools                  | 109                             |                                                   |

*Note 1: An assumed time correction has been applied, this being 5 minutes of operation in any 15-minute interval.*



**Table 10 Receiver 1 – Summary of preliminary predicted construction noise levels – Rose Street Residences**

| Phase                       | Activity                | Aggregate Sound Power Level (dBA re 1pW) | Predicted <u>Individual</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Predicted <u>Combined</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Criteria dBA L <sub>Aeq</sub> 15 minutes                                                                                                                                                                                                                                                     | Summary of Result                                                                                                                                       |
|-----------------------------|-------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Establishment Works    | Mobile crane            | 113                                      | 43 to 51                                                                            | 47 to 54                                                                          | <b><u>Standard Construction Hours:</u></b><br><br><b><u>Monday to Friday</u></b><br><u>07.00-18.00</u><br><b>= 64</b><br><br><b><u>Saturday</u></b><br><u>08.00-13.00</u><br><b>= 64</b><br><br><b><u>Highly Noise Affected Level</u></b><br><u>Standard Construction Hours</u><br><b>75</b> | <b>Works indicatively predicted to be compliant with the Noise Management Level (BG+10dBA) and well below the Highly Noise Affected Level of 75dBA.</b> |
|                             | Power hand tools        |                                          | 42 to 50                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Semi Rigid Vehicle      |                                          | 39 to 46                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
| Ground Works and Demolition | Excavator               | 119                                      | 45 to 53                                                                            | 52 to 59                                                                          |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Handheld jack hammer    |                                          | 40 to 47                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Dump truck              |                                          | 38 to 45                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Concrete saw            |                                          | 48 to 55                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Skid steer              |                                          | 43 to 51                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Power hand tools        |                                          | 42 to 50                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
| Structure                   | Handheld jack hammer    | 117                                      | 40 to 47                                                                            | 51 to 59                                                                          |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Concrete saw            |                                          | 48 to 55                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Power hand tools        |                                          | 42 to 50                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Welder                  |                                          | 34 to 42                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Concrete pump truck     |                                          | 43 to 51                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Concrete agitator truck |                                          | 41 to 49                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
| Internal Works              | Power hand tools        | 109                                      | 42 to 50                                                                            | 42 to 50                                                                          |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
| Common and External Works   | Concrete agitator truck | 117                                      | 41 to 49                                                                            | 50 to 58                                                                          |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Saw cutter              |                                          | 38 to 45                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Dump truck              |                                          | 38 to 45                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Concrete saw            |                                          | 48 to 55                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |
|                             | Power hand tools        |                                          | 42 to 50                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                              |                                                                                                                                                         |





**Table 11 Receiver 2 – Summary of predicted construction noise levels – Fairley Street Residences**

| Phase                       | Activity                | Aggregate Sound Power Level (dBA re 1pW) | Predicted <u>Individual</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Predicted <u>Combined</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Criteria dBA L <sub>Aeq</sub> 15 minutes                                                                                                                                                                                                                                                                          | Summary of Result                                                                                                                                       |
|-----------------------------|-------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Establishment Works    | Mobile crane            | 113                                      | 47 to 55                                                                            | 50 to 59                                                                          | <b><u>Standard Construction Hours:</u></b><br><br><b><u>Monday to Friday</u></b><br><u>07.00-18.00</u><br>= <b><u>58</u></b><br><br><b><u>Saturday</u></b><br><u>08.00-13.00</u><br>= <b><u>58</u></b><br><br><b><u>Highly Noise Affected Level</u></b><br><u>Standard Construction Hours</u><br><b><u>75</u></b> | <b>Works indicatively predicted to be compliant with the Noise Management Level (BG+10dBA) and well below the Highly Noise Affected Level of 75dBA.</b> |
|                             | Power hand tools        |                                          | 46 to 54                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Semi Rigid Vehicle      |                                          | 42 to 51                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
| Ground Works and Demolition | Excavator               | 119                                      | 49 to 57                                                                            | 55 to 64                                                                          |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Handheld jack hammer    |                                          | 43 to 52                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Dump truck              |                                          | 41 to 50                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Concrete saw            |                                          | 51 to 60                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Skid steer              |                                          | 47 to 55                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Power hand tools        |                                          | 46 to 54                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
| Structure                   | Handheld jack hammer    | 117                                      | 43 to 52                                                                            | 54 to 63                                                                          |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Concrete saw            |                                          | 51 to 60                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Power hand tools        |                                          | 46 to 54                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Welder                  |                                          | 38 to 46                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Concrete pump truck     |                                          | 47 to 55                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Concrete agitator truck |                                          | 45 to 53                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
| Internal Works              | Power hand tools        | 109                                      | 46 to 54                                                                            | 46 to 54                                                                          |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
| Common and External Works   | Concrete agitator truck | 117                                      | 45 to 53                                                                            | 54 to 62                                                                          |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Saw cutter              |                                          | 41 to 50                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Dump truck              |                                          | 41 to 50                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Concrete saw            |                                          | 51 to 60                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |
|                             | Power hand tools        |                                          | 46 to 54                                                                            |                                                                                   |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         |



**Table 12 Receiver 3 - Summary of predicted construction noise levels – Abode Receivers**

| Phase                       | Activity                | Aggregate Sound Power Level (dBA re 1pW) | Predicted <u>Individual</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Predicted <u>Combined</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Criteria dBA L <sub>Aeq</sub> 15 minutes           | Summary of Result                                                                                                                                  |
|-----------------------------|-------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Establishment Works    | Mobile crane            | 113                                      | 47 to 75                                                                            | 50 to 79                                                                          | <u>All days</u><br><u>All times</u><br>= <b>75</b> | <b>Works indicatively predicted to have the potential to exceed the 75dBA limit for works which are undertaken in close proximity to receiver.</b> |
|                             | Power hand tools        |                                          | 46 to 74                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Semi Rigid Vehicle      |                                          | 42 to 71                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
| Ground Works and Demolition | Excavator               | 119                                      | 49 to 77                                                                            | 55 to 84                                                                          |                                                    |                                                                                                                                                    |
|                             | Handheld jack hammer    |                                          | 43 to 72                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Dump truck              |                                          | 41 to 70                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Concrete saw            |                                          | 51 to 80                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Skid steer              |                                          | 47 to 75                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Power hand tools        |                                          | 46 to 74                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
| Structure                   | Handheld jack hammer    | 117                                      | 43 to 72                                                                            | 54 to 83                                                                          |                                                    |                                                                                                                                                    |
|                             | Concrete saw            |                                          | 51 to 80                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Power hand tools        |                                          | 46 to 74                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Welder                  |                                          | 38 to 66                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Concrete pump truck     |                                          | 47 to 75                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Concrete agitator truck |                                          | 45 to 73                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
| Internal Works              | Power hand tools        | 109                                      | 46 to 74                                                                            | 46 to 74                                                                          |                                                    |                                                                                                                                                    |
| Common and External Works   | Concrete agitator truck | 117                                      | 45 to 73                                                                            | 54 to 82                                                                          |                                                    |                                                                                                                                                    |
|                             | Saw cutter              |                                          | 41 to 70                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Dump truck              |                                          | 41 to 70                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Concrete saw            |                                          | 51 to 80                                                                            |                                                                                   |                                                    |                                                                                                                                                    |
|                             | Power hand tools        |                                          | 46 to 74                                                                            |                                                                                   |                                                    |                                                                                                                                                    |



**Table 13 Receiver 4 - Summary of predicted construction noise levels – Happy Feet Receiver**

| Phase                       | Activity                | Aggregate Sound Power Level (dBA re 1pW) | Predicted <u>Individual</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Predicted <u>Combined</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Criteria dBA L <sub>Aeq</sub> 15 minutes           | Summary of Result                                                                            |
|-----------------------------|-------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------|
| Site Establishment Works    | Mobile crane            | 113                                      | 51 to 61                                                                            | 54 to 65                                                                          | <u>All days</u><br><u>All times</u><br>= <b>75</b> | <b>Works indicatively predicted to be compliant with the Noise Management Level (75dBA).</b> |
|                             | Power hand tools        |                                          | 50 to 60                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Semi Rigid Vehicle      |                                          | 46 to 57                                                                            |                                                                                   |                                                    |                                                                                              |
| Ground Works and Demolition | Excavator               | 119                                      | 53 to 63                                                                            | 59 to 70                                                                          |                                                    |                                                                                              |
|                             | Handheld jack hammer    |                                          | 47 to 58                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Dump truck              |                                          | 45 to 56                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Concrete saw            |                                          | 55 to 66                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Skid steer              |                                          | 51 to 61                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Power hand tools        |                                          | 50 to 60                                                                            |                                                                                   |                                                    |                                                                                              |
| Structure                   | Handheld jack hammer    | 117                                      | 47 to 58                                                                            | 59 to 69                                                                          |                                                    |                                                                                              |
|                             | Concrete saw            |                                          | 55 to 66                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Power hand tools        |                                          | 50 to 60                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Welder                  |                                          | 42 to 52                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Concrete pump truck     |                                          | 51 to 61                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Concrete agitator truck |                                          | 49 to 59                                                                            |                                                                                   |                                                    |                                                                                              |
| Internal Works              | Power hand tools        | 109                                      | 50 to 60                                                                            | 50 to 60                                                                          |                                                    |                                                                                              |
| Common and External Works   | Concrete agitator truck | 117                                      | 49 to 59                                                                            | 58 to 68                                                                          |                                                    |                                                                                              |
|                             | Saw cutter              |                                          | 45 to 56                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Dump truck              |                                          | 45 to 56                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Concrete saw            |                                          | 55 to 66                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Power hand tools        |                                          | 50 to 60                                                                            |                                                                                   |                                                    |                                                                                              |



**Table 14 Receiver 5 - Summary of predicted construction noise levels – Fairly Early Childhood Receiver – Internal Areas**

| Phase                       | Activity                | Aggregate Sound Power Level (dBA re 1pW) | Predicted <u>Individual</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Predicted <u>Combined</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Criteria dBA L <sub>Aeq</sub> 15 minutes           | Summary of Result                                                                            |
|-----------------------------|-------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------|
| Site Establishment Works    | Mobile crane            | 113                                      | 51 to 65                                                                            | 54 to 68                                                                          | <u>All days</u><br><u>All times</u><br>= <b>75</b> | <b>Works indicatively predicted to be compliant with the Noise Management Level (75dBA).</b> |
|                             | Power hand tools        |                                          | 50 to 64                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Semi Rigid Vehicle      |                                          | 46 to 60                                                                            |                                                                                   |                                                    |                                                                                              |
| Ground Works and Demolition | Excavator               | 119                                      | 53 to 67                                                                            | 59 to 73                                                                          |                                                    |                                                                                              |
|                             | Handheld jack hammer    |                                          | 47 to 61                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Dump truck              |                                          | 45 to 59                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Concrete saw            |                                          | 55 to 69                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Skid steer              |                                          | 51 to 65                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Power hand tools        |                                          | 50 to 64                                                                            |                                                                                   |                                                    |                                                                                              |
| Structure                   | Handheld jack hammer    | 117                                      | 47 to 61                                                                            | 59 to 73                                                                          |                                                    |                                                                                              |
|                             | Concrete saw            |                                          | 55 to 69                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Power hand tools        |                                          | 50 to 64                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Welder                  |                                          | 42 to 56                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Concrete pump truck     |                                          | 51 to 65                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Concrete agitator truck |                                          | 49 to 63                                                                            |                                                                                   |                                                    |                                                                                              |
| Internal Works              | Power hand tools        | 109                                      | 50 to 64                                                                            | 50 to 64                                                                          |                                                    |                                                                                              |
| Common and External Works   | Concrete agitator truck | 117                                      | 49 to 63                                                                            | 58 to 72                                                                          |                                                    |                                                                                              |
|                             | Saw cutter              |                                          | 45 to 59                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Dump truck              |                                          | 45 to 59                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Concrete saw            |                                          | 55 to 69                                                                            |                                                                                   |                                                    |                                                                                              |
|                             | Power hand tools        |                                          | 50 to 64                                                                            |                                                                                   |                                                    |                                                                                              |



**Table 15 Receiver 6 - Summary of predicted construction noise levels – Fairly Early Childhood Receiver – External Areas**

| Phase                       | Activity                | Aggregate Sound Power Level (dBA re 1pW) | Predicted <u>Individual</u> Noise Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Predicted <u>Combined Noise</u> Level at Receiver dBA L <sub>Aeq</sub> 15 minutes | Criteria dBA L <sub>Aeq</sub> 15 minutes                                                                                                  | Summary of Result                                                                            |
|-----------------------------|-------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Site Establishment Works    | Mobile crane            | 113                                      | 43 to 59                                                                            | 46 to 62                                                                          | <u><b>All days</b></u><br><u>All times</u><br><br><u>External Play Areas: <b>65</b></u><br><br><u>(Defined as active recreation area)</u> | <b>Works indicatively predicted to be compliant with the Noise Management Level (75dBA).</b> |
|                             | Power hand tools        |                                          | 42 to 58                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Semi Rigid Vehicle      |                                          | 38 to 54                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
| Ground Works and Demolition | Excavator               | 119                                      | 45 to 61                                                                            | 51 to 67                                                                          |                                                                                                                                           |                                                                                              |
|                             | Handheld jack hammer    |                                          | 39 to 55                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Dump truck              |                                          | 37 to 53                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Concrete saw            |                                          | 47 to 63                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Skid steer              |                                          | 43 to 59                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Power hand tools        |                                          | 42 to 58                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
| Structure                   | Handheld jack hammer    | 117                                      | 39 to 55                                                                            | 51 to 66                                                                          |                                                                                                                                           |                                                                                              |
|                             | Concrete saw            |                                          | 47 to 63                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Power hand tools        |                                          | 42 to 58                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Welder                  |                                          | 34 to 50                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Concrete pump truck     |                                          | 43 to 59                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Concrete agitator truck |                                          | 41 to 57                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
| Internal Works              | Power hand tools        | 109                                      | 42 to 58                                                                            | 42 to 58                                                                          |                                                                                                                                           |                                                                                              |
| Common and External Works   | Concrete agitator truck | 117                                      | 41 to 57                                                                            | 50 to 66                                                                          |                                                                                                                                           |                                                                                              |
|                             | Saw cutter              |                                          | 37 to 53                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Dump truck              |                                          | 37 to 53                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Concrete saw            |                                          | 47 to 63                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |
|                             | Power hand tools        |                                          | 42 to 58                                                                            |                                                                                   |                                                                                                                                           |                                                                                              |

## 4.2 Construction Traffic Noise Assessment

It is proposed that the construction traffic would access the site via Culverston Road, Airds Road, Rose Payten Drive and Campbelltown Road.

From the criteria discussed in Section 3, it is noted that vehicle numbers on surrounding roads would need to increase by around 60% from existing traffic flows, for a 2 dB increase in road traffic noise to occur. As noted previously, a 2 dB increase in road traffic noise is not considered to be noticeable.

Based on the number of vehicles projected over each of the phases, it is concluded that noise impacts from construction traffic is unlikely to have an impact at the nearest affected properties. As a result, no further assessment is required.

## 4.3 Vibration Assessment

In order to maintain compliance with the human comfort vibration criteria discussed in Section 3, it is recommended that the indicative safe distances listed in Table 16 should be maintained. These indicative safe distances should be validated at the start of construction works by undertaking measurements of vibration levels generated by construction and demolition equipment to be used on site.

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

Additionally, any vibration levels should be assessed in accordance with the criteria discussed in Section 3. This information should also be included as part of the CNVMSP.

**Table 16 Recommended indicative safe working distances for vibration intensive plant**

| Plant                   | Rating / Description                        | Safe Working Distances (m)                               |                                                       |
|-------------------------|---------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|
|                         |                                             | Cosmetic Damage<br>(BS 7385: Part 2<br>DIN 4150: Part 3) | Human Comfort<br>(AVTG)                               |
| Vibratory roller        | < 50 kN (Typically 1 – 2 tonnes)            | 5                                                        | 15 – 20                                               |
|                         | < 100 kN (Typically 2 – 4 tonnes)           | 6                                                        | 20                                                    |
|                         | < 200 kN (Typically 4 – 6 tonnes)           | 12                                                       | 40                                                    |
|                         | < 300 kN (Typically 7 – 13 tonnes)          | 15                                                       | 100                                                   |
|                         | > 300 kN (Typically more than 13 tonnes)    | 20                                                       | 100                                                   |
| Small hydraulic hammer  | 300 kg, typically 5 – 12 tonnes excavator   | 2                                                        | 7                                                     |
| Medium hydraulic hammer | 900 kg, typically 12 – 18 tonnes excavator  | 7                                                        | 23                                                    |
| Large hydraulic hammer  | 1600 kg, typically 18 – 34 tonnes excavator | 22                                                       | 73                                                    |
| Vibratory pile driver   | Sheet piles                                 | 2 – 20                                                   | 20                                                    |
| Jackhammer              | Hand held                                   | 1                                                        | Avoid contact with structure and steel reinforcements |



## 5 NOISE AND VIBRATION MANAGEMENT PLAN

### 5.1 Acoustic Management Procedures

#### 5.1.1 Summary of Management Procedures

Table 17 below summarises the management procedures recommended for airborne noise and vibration impact. These procedures are also further discussed in the report. Hence, where applicable, links to further references are provided in Table 17.

**Table 17 Summary of mitigation procedures**

| Procedure                                   | Abbreviation | Description                                                                                                                                                                                                                                                                                                                                                                                                                              | Further Reference                                                                                                        |
|---------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>General Management Measures</b>          | GMM          | Introduce best-practice general mitigation measures in the workplace which are aimed at reducing the acoustic impact onto the nearest affected receivers.                                                                                                                                                                                                                                                                                | Refer to Section 5.7<br>For noise impact, also refer to Section 5.2<br>For vibration impact, also refer to Section 5.3.1 |
| <b>Project Notification</b>                 | PN           | Issue project updates to stakeholders, discussing overviews of current and upcoming works. Advanced warning of potential disruptions can be included. Content and length to be determined on a project-by-project basis.                                                                                                                                                                                                                 | Refer to section 5.4                                                                                                     |
| <b>Verification Monitoring</b>              | V            | Monitoring to comprise attended or unattended acoustic surveys. The purpose of the monitoring is to confirm measured levels are consistent with the predictions in the acoustic assessment, and to verify that the mitigation procedures are appropriate for the affected receivers. If the measured levels are higher than those predicted, then the measures will need to be reviewed and the management plan will need to be amended. | For noise impact, refer to Section 5.2.3 and Section 5.2.4.<br>For vibration impact, refer to Section 5.1.3              |
| <b>Complaints Management System</b>         | CMS          | Implement a management system which includes procedures for receiving and addressing complaints from affected stakeholders                                                                                                                                                                                                                                                                                                               | Refer to Section 5.5                                                                                                     |
| <b>Specific Notification</b>                | SN           | Individual letters or phone calls to notify stakeholders that noise levels are likely to exceed noise objectives. Alternatively, contractor could visit stakeholders individually in order to brief them in regard to the noise impact and the mitigation measures that will be implemented.                                                                                                                                             | Refer to section 5.4                                                                                                     |
| <b>Respite Offer</b>                        | RO           | Offer provided to stakeholders subjected to an ongoing impact.                                                                                                                                                                                                                                                                                                                                                                           | -                                                                                                                        |
| <b>Alternative Construction Methodology</b> | AC           | Contractor to consider alternative construction options that achieve compliance with relevant criteria. Alternative option to be determined on a case-by-case basis. It is recommended that the selection of the alternative option should also be determined by considering the assessment of on-site measurements (refer to Verification Monitoring above).                                                                            | -                                                                                                                        |

The application of these procedures is in relation to the exceedances over the relevant criteria. For airborne noise, the criteria are based on NMLs. The allocation of these procedures is discussed in Section 5.1.2

For vibration, the criteria either correspond to human comfort, building damage or scientific and medical equipment. The application of these procedures is discussed in Section 5.1.3.

### 5.1.2 Allocation of Noise Management Procedures

For residences, the management procedures have been allocated based on noise level exceedances at the affected properties, which occur over the designated NMLs (refer to section 3). The allocation of these procedures is summarised in Table 18 below.

**Table 18 Allocation of noise management procedures – residential receivers**

| Construction Hours                                                                                           | Exceedance over NML (dB) | Management Procedures (see definition above) |
|--------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------|
| <b>Standard Hours</b>                                                                                        | 0 - 3                    | GMM                                          |
|                                                                                                              | 4 - 10                   | GMM, PN, V <sup>1</sup> , CMS, AC            |
|                                                                                                              | > 10                     | GMM, PN, V <sup>1</sup> , CMS, SN, AC        |
| <b>Outside Standard Hours</b>                                                                                | 0 - 10                   | GMM, AC                                      |
|                                                                                                              | 11 - 20                  | GMM, PN, V <sup>1</sup> , CMS, AC            |
|                                                                                                              | > 20                     | GMM, PN, V <sup>1</sup> , CMS, SN, RO, AC    |
| <i>Notes</i><br>1. Verification monitoring to be undertaken upon complaints received from affected receivers |                          |                                              |

Please note the following regarding the allocation of these procedures:

- The exceedances have been estimated as part of the acoustic assessment, and these are summarised in Section 4.1.
- The allocation of procedures is based on the assumptions used for noise level predictions (refer to Section 4.1). Consequently, these allocations can be further refined once additional details of the construction program become available.

For non-residential receivers (such as commercial), management measures are provided in Section 5.2.4.

### 5.1.3 Allocation of Vibration Management Procedures

Table 19 below summarises the vibration management procedures to be adopted based on exceedance scenarios (i.e., whether the exceedance occurs over human comfort criteria, building damage criteria, or criteria for scientific and medical equipment). Please note these management procedures apply for any type of affected receiver (i.e., for residences as well as non-residential receivers).

**Table 19 Allocation of vibration management procedures**

| Construction Hours                                                                                           | Exceedance Scenario                                | Management Procedures             |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------|
| <b>Standard Hours</b>                                                                                        | Over human comfort criteria (refer to Section 3)   | GMM, PN, V <sup>1</sup> , RO      |
|                                                                                                              | Over building damage criteria (refer to Section 3) | GMM, V <sup>1</sup> , AC          |
| <b>Outside Standard Hours</b>                                                                                | Over human comfort criteria (refer to Section 3)   | GMM, SN, V <sup>1</sup> , RO, CMS |
|                                                                                                              | Over building damage criteria (refer to Section 3) | GMM, V <sup>1</sup> , AC          |
| <i>Notes</i><br>1. Verification monitoring to be undertaken upon complaints received from affected receivers |                                                    |                                   |

Based on the proposed equipment required to be undertaken as part of the demolition and excavation of the existing buildings on the site and the separation to the surrounding receivers, compliance with vibration criteria is expected to be achieved without additional mitigation being required.

## 5.2 Site Specific Noise Mitigation Measures

### 5.2.1 Respite Periods

Preliminary noise modelling indicates airborne construction noise levels will not exceed the Noise Management Level (NML) or the Highly Noise Affected Level (HNAL). Should construction methodologies change and result in noise levels above 75dBA at surrounding receivers, respite periods may be required however not at this point.

### 5.2.2 General Comments

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

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

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

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

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

### 5.2.3 Noise Monitoring

Based on predicted noise levels noise monitoring is not required at this time.

However, should noise monitoring be undertaken:

- The statistical parameters to be measured should include the following noise descriptors: LAmin, LA90, LA10, LA1, LAmx and LAeq. Unattended noise measurements should be conducted over consecutive 15-minute periods.
- The survey methodology and any equipment should comply with the requirements discussed in Standard AS 1055.1-1997.

### 5.2.4 Noise Mitigation Measures for Non-Residential Receivers

Where exceedances have been identified in Section 4, the following mitigation measures are recommended:

- Undertake general mitigation measures as discussed in Section 5.7
- Issue project updates to tenants in affected premises. The updates can include overview of current and upcoming works, as well as advanced warning of potential disruptions. These updates can also be issued through an email distribution list or via social media. Refer to Section 5.4 for further details.
- Signage to be posted in order to provide stakeholders information regarding project details, emergency contacts and enquiry contact information.

### 5.2.5 Alternate Equipment or Process

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

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

### 5.2.6 Acoustic Enclosures/Screening

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

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

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

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

## 5.3 Vibration Mitigation Measures

### 5.3.1 General Comments

As part of the CNVMP, the following vibration mitigation measures should be implemented:

- Any vibration generating plant and equipment is to be in areas within the site in order to lower the vibration impacts.
- Investigate the feasibility of rescheduling the hours of operation of major vibration generating plant and equipment.
- Use lower vibration generating items of construction plant and equipment; that is, smaller capacity plant.
- Minimise conducting vibration generating works consecutively in the same area (if applicable).
- Use only dampened rock breakers and/or "city" rock breakers to minimise the impacts associated with rock breaking works.
- Conduct attended measurements of vibration generating plant at commencement of works in order to validate the indicative safe working distances advised in Table 25 and, consequently, to establish safe working distances suitable to the project. Measurements should be conducted at the nearest affected property boundary. These safe working distances should be defined by considering the vibration criteria discussed in Section 2 (i.e., criteria for structural damage, human comfort and impact to scientific or medical equipment).

Construction appliances can be undertaken on the site within the recommended safe work distances providing vibration generated by the proposed activities are within the project vibration criteria as detailed in Section 3.3 of this report.

### 5.3.2 Vibration Monitoring

Based on the review of the proposed works and associated vibration levels, vibration monitoring is not required.

However, should vibration monitoring, if required, should be undertaken continuously at the nearest most affected structures in accordance with the criteria outlined in section 3.3.

## 5.4 Community Consultation

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

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

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

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

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

## 5.5 Complaints Management System

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

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

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

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

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

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

A Noise and Vibration Checklist regarding the process which will be undertaken in the event of a complaint is included in Appendix B.

## 5.6 Contingency Plans

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

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

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

## 5.7 General Mitigation Measures (Australia Standard 2436-2010)

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

### 5.7.1 Adoption of Universal Work Practices

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

### 5.7.2 Plant and Equipment

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

### 5.7.3 On Site Noise Mitigation

- Maximising the distance between noise activities and noise sensitive land uses.
- Installing purpose-built noise barriers, acoustic sheds and enclosures.

### 5.7.4 Work Scheduling

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

### 5.7.5 Source Noise Control Strategies

Some ways of controlling noise at the source are:

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

### 5.7.6 Miscellaneous Comments

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

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

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

No public address system should be used on site.



## 6 CONCLUSION

Pulse White Noise Acoustics (PWNA) has been engaged by Texco Constructions Pty Ltd to prepare a Construction Noise and Vibration Management Sub-Plan (CNVMSP) the construction of two new warehouses and associated landscaping/hardstand areas at 5 and 9 Culverston Road, Minto NSW.

This CNVMSP has been prepared to satisfy the requirements of Condition B20 and B22 of the consent given in the *Development Consent* issued for Development Application No. SSD-7500, dated 23<sup>rd</sup> June 2017 (Mod).

An assessment of noise and vibration impacts from the required processes to be undertaken during the construction period of the project (including demolition, excavation and construction) has been undertaken and suitable treatments, management controls, perioding measurements and community engagement has been detailed in this report.

Providing the recommendations in this report are included in the construction of the site, compliance with the relevant EPA's Interim Construction Noise Guideline Objectives and B20 and B22 of the projects *Conditions of Consent* can be achieved.

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

Regards

A handwritten signature in blue ink, appearing to read 'M Furlong', is positioned above the printed name.

Matthew Furlong  
Senior Acoustic Engineer  
Pulse White Noise Acoustics

## APPENDIX A – GLOSSARY OF TERMS

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------|------|-------------------------------------------------------|------|-----------------------------------------------------|------|----------------------------|------|------------------------------------------|------|---------------------------|------|--------------------------------------------|-------|--------------------------|-------|--------------------------------------|-------|-----------|
| <i>Ambient Sound</i>        | The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>Audible Range</i>        | The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>Character, acoustic</i>  | The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>Decibel [dB]</i>         | The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; <table> <tr><td>0dB</td><td>the faintest sound we can hear</td></tr> <tr><td>30dB</td><td>a quiet library or in a quiet location in the country</td></tr> <tr><td>45dB</td><td>typical office space. Ambience in the city at night</td></tr> <tr><td>60dB</td><td>Martin Place at lunch time</td></tr> <tr><td>70dB</td><td>the sound of a car passing on the street</td></tr> <tr><td>80dB</td><td>loud music played at home</td></tr> <tr><td>90dB</td><td>the sound of a truck passing on the street</td></tr> <tr><td>100dB</td><td>the sound of a rock band</td></tr> <tr><td>115dB</td><td>limit of sound permitted in industry</td></tr> <tr><td>120dB</td><td>deafening</td></tr> </table> | 0dB | the faintest sound we can hear | 30dB | a quiet library or in a quiet location in the country | 45dB | typical office space. Ambience in the city at night | 60dB | Martin Place at lunch time | 70dB | the sound of a car passing on the street | 80dB | loud music played at home | 90dB | the sound of a truck passing on the street | 100dB | the sound of a rock band | 115dB | limit of sound permitted in industry | 120dB | deafening |
| 0dB                         | the faintest sound we can hear                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 30dB                        | a quiet library or in a quiet location in the country                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 45dB                        | typical office space. Ambience in the city at night                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 60dB                        | Martin Place at lunch time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 70dB                        | the sound of a car passing on the street                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 80dB                        | loud music played at home                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 90dB                        | the sound of a truck passing on the street                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 100dB                       | the sound of a rock band                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 115dB                       | limit of sound permitted in industry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| 120dB                       | deafening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>dB(A)</i>                | <i>A-weighted decibels</i> The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.                                                                                                                                                                                                                                                |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>Frequency</i>            | Frequency is synonymous to <i>pitch</i> . Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>Loudness</i>             | A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>LMax</i>                 | The maximum sound pressure level measured over a given period.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>LMin</i>                 | The minimum sound pressure level measured over a given period.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>L1</i>                   | The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>L10</i>                  | The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>L90</i>                  | The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L <sub>90</sub> noise level expressed in units of dB(A).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>Leq</i>                  | The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>Background Sound Low</i> | The average of the lowest levels of the sound levels measured in an affected area in the absence of noise from occupants and from unwanted, external ambient noise sources. Usually taken to mean the LA90 value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>Ctr</i>                  | A frequency adaptation term applied in accordance with the procedures described in ISO 717.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |
| <i>dB (A)</i>               | 'A' Weighted overall sound pressure level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |                                |      |                                                       |      |                                                     |      |                            |      |                                          |      |                           |      |                                            |       |                          |       |                                      |       |           |



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|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Noise Reduction</i>                           | The difference in sound pressure level between any two areas. The term “noise reduction” does not specify any grade or performance quality unless accompanied by a specification of the units and conditions under which the units shall apply                                                                                                                                                                                                                                                                           |
| <i>Sound Pressure Level, <math>L_p</math> dB</i> | A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.                                                                                                                                                                           |
| <i>Sound Power Level, <math>L_w</math> dB</i>    | Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt |

## **APPENDIX B – AUTHOR CURRICULUM VITAE (CV)**

A decorative background graphic consisting of several overlapping, curved, light blue and grey lines.

## MATTHEW FURLONG SENIOR ACOUSTIC CONSULTANT



### QUALIFICATIONS

Bachelor of Creative Technology (Audio Engineering and Sound Production)

Matthew Furlong has 8 years' experience in delivering acoustic design on architectural, environmental and infrastructure projects, including conceptual, detailed design, construction and post-construction stages.

He has consulted for mixed use of commercial and residential developments, developing in-principle recommendations for the client and managing contractor providing detailed design advice as well as full construction services.

In addition to the above, Matthew has being part of many consulting teams in many education, health, fitouts and Land and Environmental Court (LEC) proceedings across the state.

### SELECTED PROJECT EXPERIENCE

#### Residential Developments

- Acoustic Design for Crown Casino Sydney
- Acoustic Design and Construction Services 130 Elizabeth Street, Sydney (One30Hyde)
- Acoustic Design and Construction Services Trinity Terraces Rosebery
- Construction Services 1a Coulson Street, Erskinvile
- Construction Services for the Erko Apartments Erskinvile
- Construction Services for the Eve Apartments Erskinvile
- Acoustic Design 54-56 Riley Street and 1 Crown Lane, Darlinghurst
- Development Application, Acoustic Design and Construction Services New Life Darling Harbour, 495 Harris Street, Ultimo
- Development Application, Acoustic Design and Construction Services Meriton Developments (Mascot, Rosebery, Epping, Parramatta, Pagewood, Bondi, Dee Why, Zetland, Waterloo, North Sydney, Sydney, Macquarie Park)
- Development Application, Acoustic Design and Construction Services Summer Hill Flourmill Stages 1, 2, 3 and 4.
- Acoustic Design and Construction Services Macquarie Park Village
- Acoustic Design and Construction Services Ryde Gardens
- Acoustic Design and Construction Services Tempo Apartments Victoria Road Drummoyne
- Development Application, Acoustic Design and Construction Services Winston Hills Mall Residential
- Construction Services Presbyterian Aged Care Paddington
- Acoustic Design and Construction Services Wahroonga Nursing Home
- Acoustic Design and Construction Anglicare Castle Hill (ARV)
- Acoustic Design and Construction Cardinal Freeman Village, Ashfield



**MATTHEW FURLONG**  
SENIOR ACOUSTIC CONSULTANT



**Commercial / Educational / Health Facilities**

- Formulation of the new Victorian Health Engineering Guidelines (Acoustics)
- Development Application and Acoustic Design 210-220 George Street Sydney
- Acoustic Design and Construction Services 151 Clarence Street, Sydney
- Development Application for 390-396 Pitt Street, Haymarket
- Acoustic Design and Construction Services Chifley Plaza Internal Works
- Development Application 371-375 Pitt Street, Sydney
- Construction Services Fitout of the Department of Premier and Cabinet
- Noise Investigations for Transport NSW (Chatswood and Burwood)
- SSDA and Acoustic Design Meadowbank Education Precinct
- CNVMP and Construction Services Anzac Park Public School
- CNVMP and Construction Services Alexandria Park Public School
- Construction Services for Wagga Wagga Base Hospital Stage 2
- Construction Services for North Shore Public Hospital
- SSDA and Acoustic Design for Concord Repatriation General Hospital
- SSDA and Acoustic Design Nepean Public Hospital
- Construction Services for South East Regional Hospital (Bega)
- Acoustic Design for North Shore Health Hub
- Acoustic Design Sydney Children's Hospital Stage 1 & Children's Comprehensive Cancer Centre (SCH1/CCCC), Randwick

**Licensed Premises**

- Development Application for The Cauliflower Hotel, Waterloo
- Development Application for Christopher Hanna Salon and Bar, 13-15a Bridge Street, Sydney

**Industrial Developments**

- Acoustic Design Erskine Park Industrial Area
- Acoustic Design and Construction Services Snackbrands Orchard Hills

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## **APPENDIX C – NOISE AND VIBRATION INVESTIGATION CHECKLIST**



# Noise & Vibration Investigation Checklist

210626 - 5 & 9 Culverston Road, Minto - N+V Checklist.docx



Pulse White Noise Acoustics (PWNA) have prepared the following noise and vibration investigation checklist to assist the onsite construction team in investigation any received noise and vibration complaint or identifying an exceedance over the management levels. This checklist should be completed in conjunction with the *Construction Noise Vibration Management Sub-Plan* prepared by PWNA.

Should any noise and vibration complaint be received, the contractor must complete the following steps:

## **Exceedance/Complaint Information**

Complaint reference number:.....

Date Received: .....

Location of Complaint: .....

Complainant Contact Details:.....

| Step | Task                                                                                                                                                                                                                       | Completed Response |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 1    | Pause onsite works                                                                                                                                                                                                         |                    |
| 2    | Identify the main source(s) construction noise and/or vibration within specific areas of the site which is impacting the most at the sensitive receiver.                                                                   |                    |
| 3    | Review the identified equipment and determine if an alternate piece of equipment can be used or the process can be altered.<br><b><i>(If no, skip to step 5)</i></b>                                                       |                    |
| 4    | In the event an alternate piece of equipment or process can be used, works can re-commence incorporating possible and practical mitigation measures.                                                                       |                    |
| 5    | In the event an alternate piece of equipment or process cannot be determined implement a construction assessment to be performed by a suitably qualified acoustic consultant. This may include additional respite periods. |                    |