

WESTERN NORTH SOUTH LINK ROAD

Construction Environmental Management Plan SSD 7348

Prepared for:

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BASIS OF REPORT

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DOCUMENT CONTROL

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1 Introduction

1.1 Development Overview

The Western North South Link Road (WNSLR) is an Interim Regional Road located on the eastern boundary of the Oakdale West Industrial Estate (Oakdale West). Oakdale West is a regional warehouse and distribution hub, is located at Kemps Creek within the Penrith local government area (LGA) and forms part of the broader Oakdale Industrial Precinct located within the Western Sydney Employment Area (WSEA) (see **Figure 1**).

Goodman Property Services (Aust) Pty Ltd (Goodman) obtained Development Consent SSD 7348 on 13 September 2019 from the Department of Planning, Industry and Environment (DPIE) for the Oakdale West 'Concept Proposal' and 'Stage 1 Development'. The Concept Proposal essentially comprises a 'Master Plan' to guide the staged development of Oakdale West and core development controls that will form the basis for design and assessment of future development applications for the site. It includes:

- Establishing primary site access, road layouts (including internal road network and connections to the external road network), developable and non-developable lands, biodiversity offsets, indicative development stages and development controls for the future development of the site;
- Stage 1 Development of the Estate including:
 - Estate Works, including site preparation, bulk earthworks and retaining walls, catchment level stormwater infrastructure, trunk services connections and utility infrastructure, roads and access infrastructure associated with Stage 1 and subdivision in Stage 1 development works;
 - Precinct Development, including construction, fit out and use of warehouse buildings within Precinct 1, detailed earthworks, on lot stormwater, services and utility infrastructure and construction of industrial/warehouse buildings;
 - Construction of a new regional road known as the Western North South Link Road (WNSLR) connecting to Lenore Drive to provide the primary access to the site; and
 - Western boundary landscaping.

Whilst Development Consent SSD 7348 has been granted for the Oakdale West 'Concept Proposal' and 'Stage 1 Development' which incorporates all of the above works, this Construction Environmental Management Plan (CEMP) is specifically for the construction of the WNSLR only.

The WNSLR is intended to provide a connection between Lenore Drive and the future Southern Link Road currently under investigation by the DPIE. In the short term the WNSLR will be a public road managed by Penrith City Council (Council), providing local access for Oakdale West and other industrial areas north of the Water NSW pipeline located on the northern boundary of Oakdale West (see **Figure 2**).

A copy of Development Consent SSD 7348 is attached as **Appendix A**.

Construction of the WNSLR is to be undertaken by Robson Civil Projects (Robson). AT&L Associates (AT&L) will act as the Project Manager and Contract Superintendent overseeing both the construction of the WNSLR and Oakdale West.

Note: Where Goodman is nominated as having responsibility as the Applicant, this may be delegated to their specialist consultants.

For the purposes of this document, the development is described in *Environmental Impact Statement, Oakdale West Estate - State Significant Development Application* (EIS) prepared by Urbis (2017), including all specialist assessments and other appendices.

Figure 1 Regional Locality (SLR 2019)

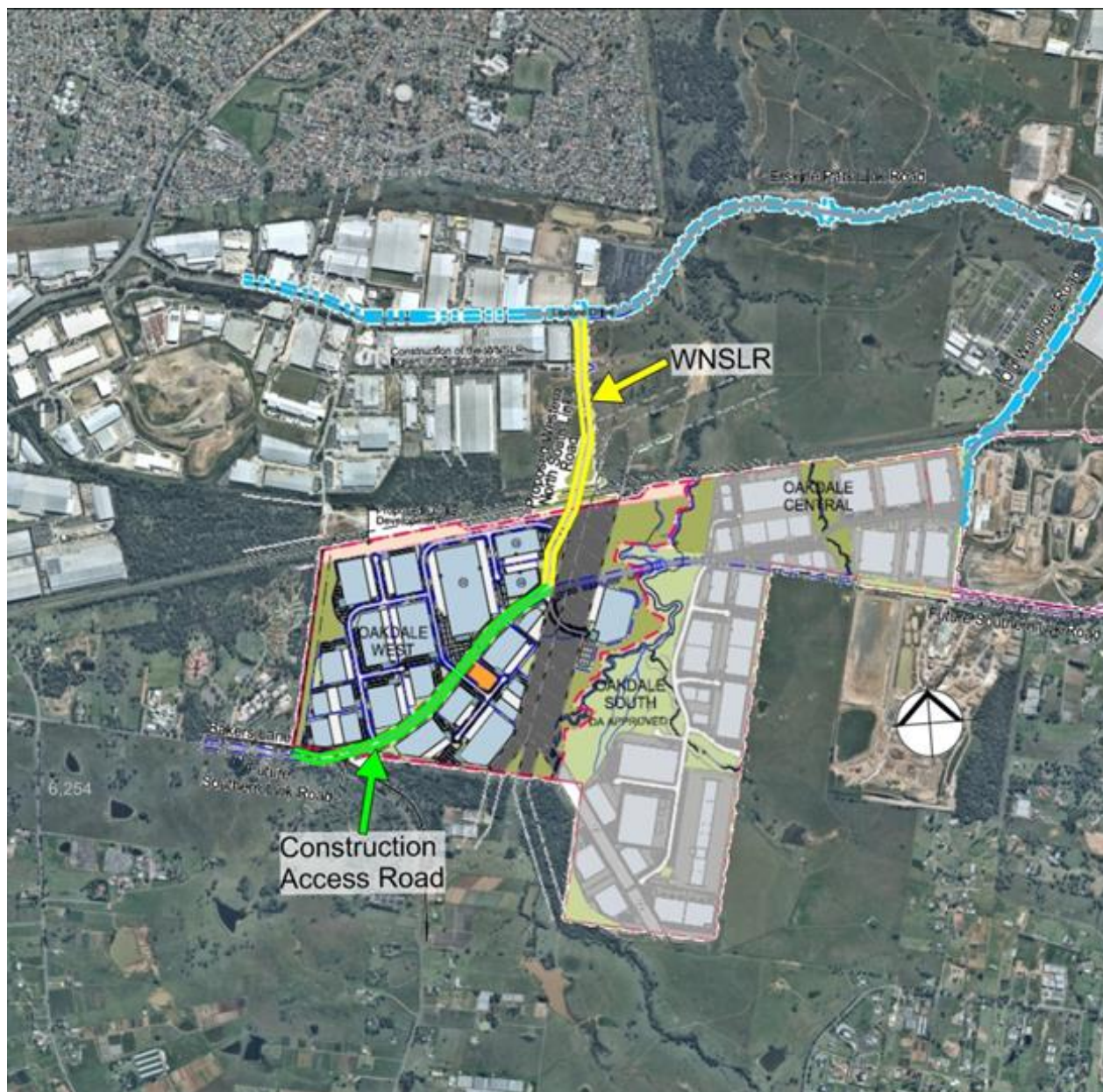


Figure 2 WNSLR Layout



1.2 Construction Environmental Management Plan

The CEMP has been prepared to address the specific requirements of SSD 7348 and in consideration of the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources 2004), SSD 7348 and Road and Maritime Services (RMS) *QA Specification G36* (G36) (2018b), *QA Specification G38* (G38) (RMS 2018c) and *QA Specification G40* (G40) (2018d).

As required by SSD 7348 and G36, G38 and G40, the CEMP is required to include the following specialist management plans. Additionally required by G36, a Contractor's Environmental Management Plan will be prepared by Robson.

Table 1 summarises the specialist management plans required by SSD 7348 and the RMS guidelines.

Table 1 Specialist Management Plan Requirements

SSD 7348	G36	G38	G40
Procedure for managing bulk earth works (Condition D121(a))	Air Quality Management Plan	Soil and Water Management Plan	Clearing and Grubbing Plan (prepared by Robson as part of the Contractor's Environmental Management Plan)
Landscape Management Plan (LMP) (Condition D35)	Construction Noise and Vibration Management Plan	Erosion and Sediment Control Plan	
Construction Traffic Management Plan (CTMP) (Condition D65)	Waste Management Plan	Water Quality Monitoring Program	
Consultation Schedule for TfNSW (former RMS) and Water NSW (Condition D57 and D58)	Fill Importation Protocol		
Construction Noise and Vibration Management Plan (CNVMP) (Condition D73)	Material Tracking Plan		
Fill Importation Protocol (Condition D79)			
Erosion and Sediment Control Plan (Condition D80)			
Flora and Fauna Management Plan (FFMP) (Condition D88)			
Snake Management Measures (Condition D96) (not related to the WNSLR)			

SSD 7348	G36	G38	G40
Construction Air Quality Management Plan (CAQMP) (Condition D100)			
Unexpected Finds Protocol – Archaeological Items (Conditions D106 and D108)			
Unexpected Contamination Protocol (Condition D116)			
Community Consultation and Complaints Handling Procedure (Condition D121(i))			
Community Consultation Strategy (Condition C19)			
Waste Management Plan (WMP) (Condition D112)			
Bushfire Protection Assessment (Condition D97)			

As noted in **Table 1**, specialist management plans related to the same environmental issue are required more than once, including:

- Construction Air Quality Management Plan;
- Construction Noise and Vibration Management Plan;
- Waste Management Plan;
- Fill Importation Protocol; and
- Erosion and Sediment Control Plan.

These have been prepared to satisfy the requirements of both SSD 7348 and the applicable RMS guidelines.

1.2.1 Scope

This CEMP has been prepared to satisfy Conditions D118 – D122 of SSD 7348. The specific requirements of these consent conditions, along with where these requirements have been addressed within this CEMP, are listed in **Table 2**. A separate CEMP has been prepared for Oakdale West.

Table 2 CEMP Context

SSD 7348 Consent Condition	CEMP Section
D118. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
a) details of: <ul style="list-style-type: none"> (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; 	<ul style="list-style-type: none"> (i) Section 3.3 (ii) Section 4 (iii) Refer to specialist management plans
b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 4
c) a program to monitor and report on the: <ul style="list-style-type: none"> (i) impacts and environmental performance of Stage 1; and (ii) effectiveness of the management measures set out pursuant to paragraph (b) above; 	Section 5
d) 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;	Section 5.4
e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time;	Section 6
f) a protocol for managing and reporting any: <ul style="list-style-type: none"> (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); (ii) complaint; (iii) failure to comply with statutory requirements; and 	<ul style="list-style-type: none"> (i) Section 3.5 and 5.2 (ii) Section 3.6 and 5.2 (iii) Section 5.2
g) a protocol for periodic review of the plan. Note: <i>The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i>	Section 6
D119. The Applicant must prepare a Construction Environmental Management Plan (CEMP) for Stage 1, including the WNSLR, in accordance with the requirements of Condition D118 and to the satisfaction of the Planning Secretary. The Applicant may prepare separate CEMPs for the Stage 1 works and the WNSLR, addressing all relevant requirements of this consent.	This Plan
D120. Prior to finalising the CEMP, the Applicant must consult with TfNSW (including the former RMS), Council and Water NSW. The Applicant must also attend a site visit with Water NSW personnel to mark the exact works area for the WNSLR bridge crossing.	Section 1.2.3
D121. As part of the CEMP required under Condition D119 of this consent, the Applicant must include:	
a) detailed procedures for managing bulk earthworks to avoid adverse water quality impacts on Ropes Creek, including, but not limited to: <ul style="list-style-type: none"> (i) any staging of earthworks to minimise disturbed areas; (ii) limits on the areal extent of earthworks; (iii) progressive grassing of exposed areas, as soon as reasonably practicable, focusing on areas where building construction will occur at a later stage; 	Section 2.2.1

SSD 7348 Consent Condition	CEMP Section
b) Landscape Management Plan (LMP) (see Condition D35);	Section 4.8
c) Construction Traffic Management Plan (CTMP) (see Condition D65);	Section 4.5
d) Consultation Schedule for TfNSW and Water NSW (see Conditions D57 and D58);	Section 1.2.3
e) Construction Noise and Vibration Management Plan (CNVMP) (see Condition D73);	Sections 4.2 and 4.3
f) Fill Importation Protocol (see Condition D79) and Erosion and Sediment Control Plan (see Condition D80);	Section 4.6
g) Flora and Fauna Management Plan (FFMP) (see Condition D88);	Section 4.8
h) Snake Management Measures (see Condition D96);	Section 4.8
i) Construction Air Quality Management Plan (CAQMP) (see Condition D100);	Section 4.4
j) Unexpected Finds Protocol (see Conditions D106 and D108);	Section 4.9
k) Unexpected Contamination Protocol (see Condition D116); and	Section 4.10
l) a Community Consultation and Complaints Handling Procedure.	Section 4.12
D114. The Applicant must: a) not commence construction of Stage 1 until the CEMP is approved by the Planning Secretary; and b) carry out the construction of Stage 1 in accordance with the CEMP approved by the Planning Secretary	Noted

1.2.2 Objectives

The objectives of this CEMP are to:

- Establish the framework for managing and mitigating the potential for adverse environmental impacts as a result of the construction of the WNSLR;
- Clearly and concisely document the commitments made in the EIS (Urbis 2017) and Response to Submissions (RTS), including relevant management plans, that are required to be implemented with during construction;
- Demonstrate to DPIE how the applicant proposes to meet all of its regulatory obligations including those outlined in the Conditions of consent;
- Outlines the controls to be implemented by the contractor in order to meet those obligations;
- Clearly and concisely document the conditions imposed by SSD 7348 that are required to be implemented and/or complied with during the construction phase; and
- Assist to establish the WNSLR in a manner that avoids (where possible) or minimises impact to the surrounding environment and populace.

1.2.3 Consultation

In accordance with SSD 7348, consultation has been undertaken with the applicable stakeholders which is summarised in Table 3. A Consultation Schedule for Transport for New South Wales (TfNSW) (former RMS) and Water NSW (SSD Conditions D57 and D58), and evidence of consultation for the CEMP (TfNSW (former RMS), Council and Water NSW) are attached as Appendix B and

Appendix C, respectively. In addition, consultation has been ongoing with Endeavour Energy for approval of electrical reticulation for the WNSLR and the OWE works, with evidence included in Appendix C. Table 3 Consultation

Condition	Comment
<p>D10. Where conditions of this consent require consultation with an identified party, the Applicant must:</p> <ul style="list-style-type: none"> a) consult with the relevant party prior to submitting the subject document to the Planning Secretary for approval; and b) provide details of the consultation undertaken including: <ul style="list-style-type: none"> (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved. 	<p>Evidence of consultation will be provided separately to the DPIE.</p>
<p>WATER NSW</p> <p>D31. The Applicant must:</p> <ul style="list-style-type: none"> d) consult with Water NSW during preparation of the CEMP, in accordance with Condition D119, and attend a site visit with Water NSW personnel, prior to finalising the CEMP, to mark the exact works area for the WNSLR bridge crossing. 	<p>The Consultation Schedule is attached as Appendix B. Consultation was undertaken with Water NSW and is attached as Appendix C.</p>
<p>Landscape Management Plan</p> <p>D35. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Landscape Management Plan (LMP), to the satisfaction of the Planning Secretary. The plan must form part of the CEMP in accordance with Condition D119 and the OEMP in accordance with Condition D130 and must:</p> <ul style="list-style-type: none"> a) be prepared in consultation with Council; 	<p>This was completed and is included in the Landscape Management Plan (see Appendix Q).</p>
<p>D57. The Applicant must develop a schedule for consultation with and approval by TfNSW for the construction of the bridge foundations over the future WSFL, including geotechnical and structural certification as required by TfNSW. The schedule must form part of the CEMP required by Condition D119.</p>	<p>A Consultation Schedule for TfNSW and Water NSW is attached as Appendix B.</p>
<p>D58. The Applicant must develop a schedule for consultation with and approval by Water NSW for the construction of the bridge over the water pipelines corridor. This schedule must form part of the CEMP required by Condition D119.</p>	<p>A Consultation Schedule for TfNSW and Water NSW is attached as Appendix B.</p>
<p>Construction Traffic Management Plan</p> <p>D65. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Construction Traffic Management Plan to the satisfaction of the Planning Secretary. The plan must form part of the CEMP required by Condition D119 and must:</p> <ul style="list-style-type: none"> b) be prepared in consultation with Council, Mamre Anglican School, Emmaus Catholic College, Emmaus Catholic Care Village and Trinity Catholic Primary School; 	<p>This was completed and is included in the Construction Traffic Management Plan (see Appendix L).</p>
<p>Construction Noise and Vibration Management Plan</p> <p>D73. The Applicant must prepare a Construction Noise and Vibration Management Plan (CNVMP) for Stage 1, to the satisfaction of the Planning Secretary. The CNVMP must form part of a CEMP in accordance with Condition D119 and must:</p> <ul style="list-style-type: none"> f) describe the community consultation undertaken to develop the strategies in Condition D73(e); 	<p>This was completed and is included in the Construction Noise and Vibration Management Plan (see Appendix J).</p>

Condition	Comment
Community Engagement D117. The Applicant must consult with the community regularly throughout Stage 1, including consultation with the nearby sensitive receivers identified in Appendix 5, relevant regulatory authorities, Registered Aboriginal Parties and other interested stakeholders. Community engagement shall be undertaken in accordance with the Community Communication Strategy approved in accordance with Condition C19.	Appendix I
D120. Prior to finalising the CEMP, the Applicant must consult with TfNSW (including the former RMS), Council and Water NSW. The Applicant must also attend a site visit with Water NSW personnel to mark the exact works area for the WNSLR bridge crossing.	Consultation is attached as Appendix C . A site inspection was undertaken on 10 July 2019.
D121. As part of the CEMP required under Condition D119 of this consent, the Applicant must include: d) Consultation Schedule for TfNSW and Water NSW (see Conditions D57 and D58);	A Consultation Schedule for TfNSW and Water NSW is attached as Appendix B .

2 Development Description

The WNSLR is approximately 1.3km in length and 30m wide, and provides a link between Oakdale West, Lenore Drive to the north and the future Southern Link Road to the south. The corridor will be bound by Fitzpatrick land on both sides of the corridor for the northern portion, Water NSW land on both sides of the corridor for the middle portion, Goodman land to the west and the existing Transgrid easement to the east for the southern portion. A Water NSW pipeline intersects the proposed WNSLR alignment, therefore a bridge is to be constructed over the pipeline. A Construction Access Road will also be constructed by Robson which connects Bakers Lane to the WNSLR.

2.1 Location

Located in the Penrith local government area (LGA) at the far south western extent of the WSEA, the WNSLR is made up of the following five land parcels legally described as:

- Lot 3031, DP 1168407 (owned by Fitzpatrick Investments);
- Lot 6, DP 229784 (owned by Water NSW);
- Lot 2, DP 84578 (owned by Water NSW);
- Lot 3, DP 85393 (owned by Water NSW); and
- Lot 11, DP1178389 (owned by Goodman).

2.2 Construction Staging and Activities

Stage 1 development of the Oakdale West Concept Proposal includes the site preparation and infrastructure works required to facilitate further development of the estate in line with the Concept Proposal. This includes the construction of the WNSLR and connection to the estate road network along with the development of Precinct 1 for warehousing and distribution.

WNSLR includes the construction of the following intersections:

- A 4-leg signalised intersection with Lenore Drive, providing access to the regional road network and a local connection;
- A 4-leg roundabout intersection with Lockwood Road (previously a cul-de-sac), providing a local connection between WNSLR and Templar Road as well as providing a connection for a local road supporting development to the east, comprising the balance of Fitzpatrick lands;
- A 3-leg roundabout to a T-junction to Estate Road 1, providing primary access to Oakdale West and will be the sole access provided to Precincts 1 - 4 until the completion of the SLR; and
- A full road construction with temporary line marking between Estate Road 1 and the future Southern Link Road to provide connection in advance of the Southern Link Road.

WNSLR also includes the construction of the Construction Access Road along the future Southern Link Road alignment through Oakdale West. The WNSLR also includes the construction of Bio-retention Basin 1.

Construction is scheduled to commence in late October 2019 (earlier if possible, subject to all post-approval requirements). Robson (preferred contractor for the construction of the WNSLR) estimate the construction program to take approximately 50 weeks, subject to any delays during construction (i.e. wet weather or authority delays) which may increase the duration of the works.

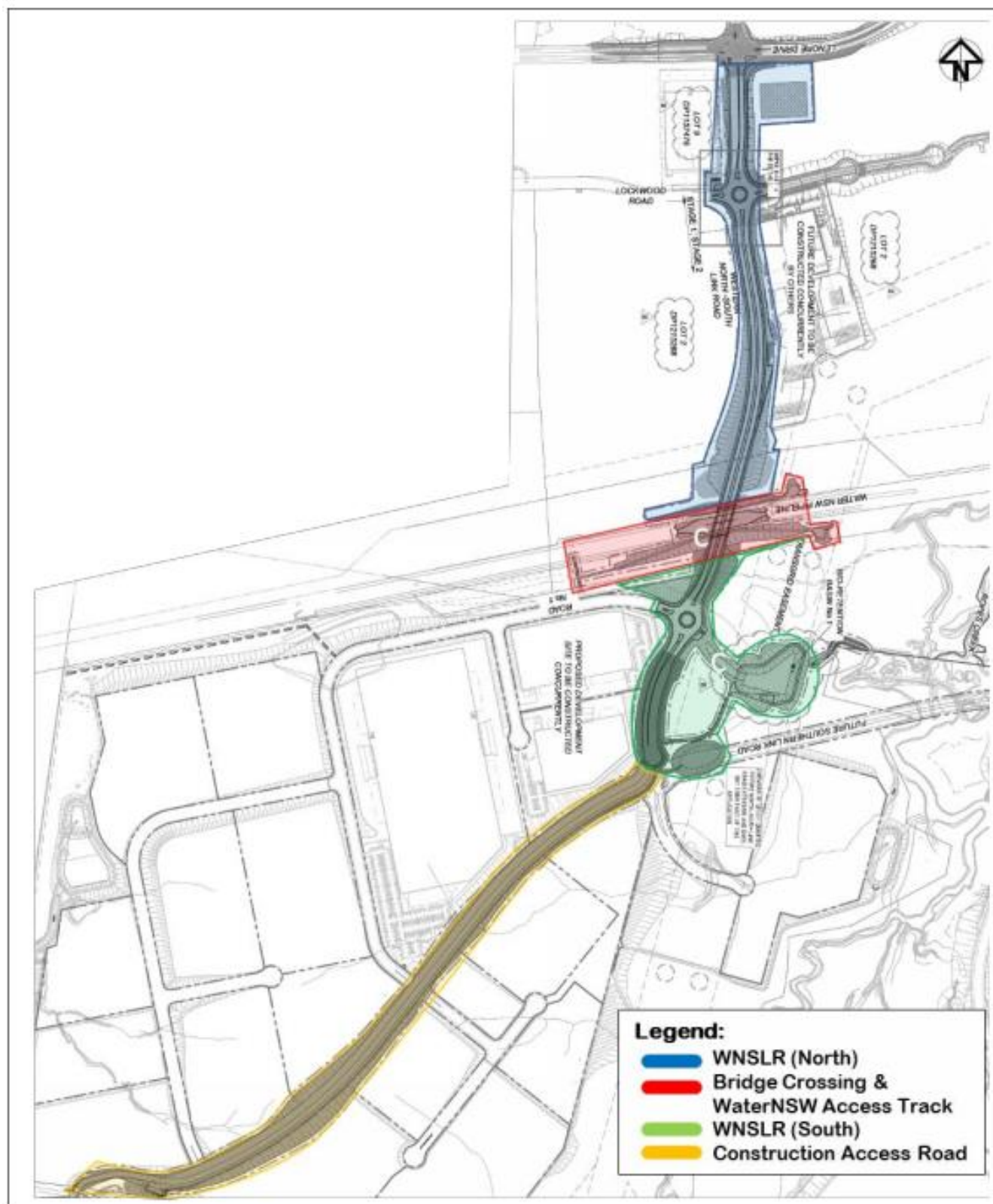
Construction of the Construction Access Road (see **Figure 3**) will be undertaken first and will take approximately 12-16 weeks. All other work zones will be constructed concurrently until completion of the project.

As part of the bridge construction, earthworks are required on either side of both Water NSW pipelines. This work includes lowering the existing access track between the pipes to provide the necessary clearance under the bridge, as well reshaping the existing outside batters to provide access to the bridge abutments for maintenance.

During this, and any other works in the vicinity of the pipeline, the Water NSW protocol for working in close proximity to the pipelines is to be followed. This document will form part of the Safe Work Plan currently being developed by Robson which is required to be accepted by Water NSW before access is granted to the corridor. The most important element of this protocol is that Water NSW are immediately notified in the event of any impact to the pipeline so that they can inspect the pipes prior to confirming whether any remedial work is required.

All works will be undertaken in accordance with the approved Staging Plan as required by Condition B15 of SSD 7348.

Figure 3 Construction Work Zones



2.2.1 Erosion and Sediment Control Staging

In accordance with D80 of SSD 7348, an Erosion and Sediment Control Plan (ESCP) which contains Progressive Erosion and Sediment Control Plans (PESCP) (see Appendix F of the ESCP) has been developed to document all control measures to be implemented to control surface runoff prior to any interaction with Ropes Creek). This plan documents the staged nature of topsoil stripping to facilitate bulk earthworks whilst managing the risk of surface runoff adversely impacting Ropes Creek.

The staging of the works can be summarised as follows:

- Short term temporary controls installed at nominated basin locations which are broadly located at the low points along the scope of works;
- Localised topsoil stripping at these low points which is placed and compacted in windrows so as to divert surface water runoff towards these controls and divert /separate off site water past or through WNSLR works;
- Once sufficient areas of topsoil have been stripped to facilitate early earthworks placement excavation of the nominated basins takes place; and
- Once the basins of the calculated capacity are excavated topsoil stripping continues with it being placed in compacted windrow to continue to divert surface runoff into these basins.

The nature of the works to be constructed is such that the full scope will require topsoil to be stripped in order to allow the cut and fill operations to be constructed. Topsoil stripping and clearing will be completed progressively where possible. Stripped topsoil will be stockpiled in accordance with the ESCP. This stripping allows the number of vehicle movements to be minimised mitigating air quality concerns. These works will be prioritised in order to get them to the top of final formation as quickly as possible so that pavement materials can be placed and the long term stabilisation (spray seal) or landscaping placed as quickly as possible.

The control measures to be implemented are selected and calculated based on site specific conditions which are all outlined in the ESCP. Management of all other controls to be implemented, are detailed in the ESCP and **Section 4.6**. The ESCP provides details of procedures for managing bulk earthworks to avoid adverse water quality impact on Ropes Creek, as required by Condition D121.

2.3 Construction Hours

Construction hours will be in accordance with Conditions D70 and D71 of Development Consent SSD 7348, which are reproduced below:

D70. The Applicant must comply with the hours detailed in Table 5, unless otherwise agreed in writing by the Planning Secretary.

Table 5: Hours of Work

Activity	Day	Time
Construction	Monday – Friday	7 am to 6 pm
	Saturday	8 am to 1 pm

D71. Works outside of the hours identified in Condition D70 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 Planning 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 or to prevent environmental harm.*

Additionally, Section 3.6 of G36 (RMS 2018b) lists the same construction hours set out in SSD 7348. G36 states that work outside of normal working hours is permitted without prior approval in the following circumstances:

- Delivery of materials outside of normal working hours, where delivery at such times is required by the Police or other authorities for reasons of safety or otherwise; or
- Work during an emergency, where such work is necessary to avoid the loss of lives, property and/or prevent environmental harm.

The construction hours will be provided to all staff and contractors in the induction. The movements of staff and contractors will be recorded for this project.

Noisy works to be undertaken out of hours is discussed in the Construction Noise and Vibration Management Plan (CNVMP) attached as **Appendix I**.

2.4 Construction Site Access

The construction of the WNSLR will occur in accordance with **Section 2.2**. In accordance with the Construction Traffic Management Plan (CTMP) (Ason 2019), **Table 4** details the site access arrangements for the applicable work zones shown in **Figure 3**.

Table 4 Site Access

Work Zones	Access Arrangement
Construction Access Road	Via Bakers Lane.
WNSLR (North)	Primary access via Lockwood Road to facilitate all movement access to Lenore Drive. Left-in, left-out access to Lenore Drive.
Bridge Crossing	<ul style="list-style-type: none"> • Northern section – to/from Lenore Drive via Lockwood Road and from Lenore Drive. Central section – entry from Old Wallgrove Rd, under a right-in-left-out arrangement and with an approved Traffic Control Plan (to be submitted by Robson). • Southern section – to/from Mamre Road via Bakers Lane (Aldington Road to be used as a secondary route only).
WNSLR (South)	In the short term, access will be to/from Mamre Road via Bakers Lane. Upon completion of the Bridge Crossing works, additional access shall be to Lenore Drive via the WNSLR (Aldington Road to be used as a secondary route only).

2.5 Construction Contact Details

Table 5 lists the key contacts during the construction of the WNSLR.

Table 5 Construction Contact List

Role	Name	Company	Contact Details
Project Principal	Kym Dracopoulos	Goodman	0411 511 431 kym.dracopoulos@goodman.com
Principal's Superintendent	Mark Ward	AT&L	0408 699 026 mark.w@atl.net.au
Contract Superintendent	AT&L	AT&L	02 9437 1777 info@atl.net.au
Project Manager	Alex Lohrisch	AT&L	0415 398 014 alexl@atl.net.au
Contractor's Project Manager	Mark Dolan	Robson	0409 161 886 mark.dolan@robsoncivil.com.au
Safety and Environmental Coordinator	Dorothy Wonson	Robson	0437 414 962 dorothy.wonson@robsoncivil.com.au
Environmental Representative	Carl Vincent	ERSED	0424 203 046 carl.vincent@ersed.com.au
Communications and Community Liaison Representative	Dan Thompson	SLR	0428 060 995 dthompson@slrconsulting.com

3 Environmental Management Framework

3.1 Robson's Environmental Management Policy

Robson have developed and implemented an integrated management system covering WHS, Environment and Quality Management. The Project Management Plans are developed on a site and works specific basis guided by this CEMP and provide information and direction in line with the integrated management approach, supported by supplementary plans and appendices as required for the works.

The Robson Management System is certified to AS/NZS 4801, ISO 9001 and ISO 14001. A copy of the Environmental Management Policy is attached as **Appendix D** (Robson 2019b).

3.2 Roles and Responsibilities

The key personnel responsible for environmental management during construction of the WNSLR are listed in **Table 6**.

Table 6 Personnel Responsible for Environmental Management

Role	Responsibilities
Project Principal	Environmental reporting responsibility associated with the development.
Contract Superintendent	Environmental reporting responsibility associated with the development.
Project Manager	Environmental reporting responsibility associated with the development.
Contractor's Project Manager	<ul style="list-style-type: none"> • Liaise with Goodman to keep them informed of the project's progress; • Overall responsibility for environmental management and compliance with SSD 7348 and relevant legislation; • Coordinate environmental inspections and reporting and authority liaisons; • Record, notify, investigate and respond to any environmental incidents and, where necessary, develop and implement corrective actions; • Consult and engage with Burton (preferred contractor for the construction of the Stage 1 bulk earthworks and infrastructure works) regarding the environmental management of the Site; • Attend the Environmental Review Group (ERG) meetings; • Oversee the implementation of this CEMP and provide adequate resources to enable implementation of this CEMP; • Provide adequate environmental inductions/training to employees and contractors regarding their requirements under this CEMP; • Report on the performance of the CEMP to the Project Manager for review and as a basis for system improvement; and • Direct reasonable steps be taken to avoid or minimise any unintended or adverse environmental impacts, and, failing the effectiveness of such steps, direct that the relevant actions cease immediately should an adverse impact on the environment be likely to occur.

Role	Responsibilities
Safety and Environmental Coordinator	<ul style="list-style-type: none"> • Ensure the legislative and corporate safety, health and environment management measures and controls are implemented and maintained; • Participate in risk and hazard identification and control; • Participate in incident investigations and management; and • Participate in health and safety inspections.
Communications and Community Liaison Representative	<ul style="list-style-type: none"> • Lead and manage the community involvement activities, including liaison with property owners and key stakeholders; • Attend the ERG meetings; • Be the primary daily contact to the public handling of enquiries / complaints management / interface issues; • Be available for contact by local residents and the community at all reasonable times to answer any questions; • Liaise with property owners to co-ordinate access and to deal with specific property related issues arising from the upgrade works; • Lead the delivery of communication and community engagement strategies and plans; • Facilitate meetings, forums and arranging interviews to address concerns from community; • Provide advice and participate with the project teams to improve and enhance the delivery of communication services to the community; • Build, maintain collaborative and consultative working relationships with internal and external stakeholders; and • Be available for contact by local residents, key stakeholders and community representatives to answer queries and provide more information or feedback.
All employees, contractors and subcontractors	<ul style="list-style-type: none"> • Ensure familiarity, implementation and compliance with this CEMP and appended management plans; • Support Robson's, AT&L's and Goodman's commitment to sustainability, environmental management and compliance; • Work in a manner that will not harm the environment or impact on surrounding receptors; • Report all environmental incidents and complaints to the Project Manager without delay; and • Report any inappropriate construction practices and/or environmental management practices to the Project Manager without delay.

3.3 Statutory Requirements

The Development will be constructed in accordance with SSD 7348, G36, G38, G40, and also in accordance with the other documents referenced under Condition B5 of the Consent:

- The EIS (Urbis 2017) and RTS;
- The development layout plans and drawings attached to the Development Consent as Appendix 1, which have been sourced from the EIS (Urbis 2017); and
- The management plans and mitigation measures (attached to the Development Consent as Appendix 7).

If there is any inconsistency between the plans and documentation referred to in Condition B5, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of SSD 7348 prevail to the extent of any inconsistency. The Project Manager will be notified if any inconsistencies are identified.

SSD 7348, G36, G38 and G40 impose a number of environmental performance and management requirements applicable to the construction of the WNSLR. The consent conditions applicable to the WNSLR are listed in **Appendix E (N.B. The administrative conditions and conditions relating to the operational phase have not been included in Appendix E, only those conditions specific to site construction have been included)**. The requirements of G36 are summarised in **Appendix F**. Note: G38 has been addressed in the Soil and Water Management Plan (SWMP) (Robson 2019c) and G40 has been addressed in the Contractor's Environmental Management Plan (Robson 2019a).

3.4 Inductions and Environmental Training

The Contractor's Project Manager will ensure that all employees and contractors involved in the construction of the WNSLR are appropriately inducted and trained prior to commencing work on site. Training in relation to environmental responsibilities and implementation of this CEMP will take place initially through the site induction training and then on an ongoing basis through 'toolbox talks' (or similar).

In accordance with G36 (RMS 2018b), environmental induction training will cover all elements of the CEMP and will include, as a minimum, the following:

- Purpose and objectives of the CEMP;
- Requirements of due diligence and duty of care;
- Conditions of any environmental licences, permits and approvals;
- Potential environmental emergencies on site and the emergency response procedures (including the Emergency Spill Response Plan), locations and training in the use of emergency spill kits for spills on water and on land;
- Reporting, and notification and management requirements for pollution, contamination and other environmental incidents, and for damage and maintenance to environmental controls;
- High-risk activities and associated environmental safeguards i.e. earthworks, vegetation clearing, night works, operation and maintenance of concrete washouts, and washing, refuelling and maintenance of plant and equipment;
- Working in or near environmentally sensitive areas; and
- Site-specific issues including:
 - Erosion and sediment controls, water quality controls and sediment basin management (see G38 and **Section 4.6**);
 - Responsibilities under the *National Parks and Wildlife Act 1974*, including the need to cease work immediately and report any object of potential Aboriginal heritage unearthed during clearing, grubbing and earthworks operations (see **Section 4.9**);
 - Responsibilities under the *Heritage Act 1977* if an object of potential non-Aboriginal heritage is uncovered during construction;
 - Noise, vibration and air quality management controls (see **Sections 4.2, 4.3 and 4.4**);

- Requirement to maintain surrounding property access for residences and businesses and to minimise disruptions to these properties for the duration of construction;
- Location of reuse bins, washing, refuelling and maintenance of vehicles, plant and equipment;
- Waste minimisation principles (see **Section 4.7**);
- Boundaries for vegetation clearing, fauna and fauna habitat management, including awareness of threatened fauna species and fauna rescue (see **Section 4.8**);
- Identification, reporting and management of contaminated land(see **Section 4.10**); and
- Incident management processes (see **Section 3.5**).

Toolbox talks will be held to identify environmental issues and controls when works commence in a new area of the site or a new activity, as well as when environmental issues arise on site. The toolbox talk will include but not be limited to:

- A description of the activity and the area;
- Identification of the environmental issues and risks for the area (including fauna or flora); and
- Outline the mitigations measures for the works and the area (see **Section 4**).

All employees conducting environmental training and site staff assigning work activities will demonstrate that they are competent and appropriately trained to train and manage construction site specific environmental issues (G36 (RMS 2018b)).

A register of all environmental training carried out, including dates, names of persons trained and trainer name and qualification details will be established and maintained for the duration of works.

3.5 Incident and Non-Compliance Response and Handling Procedure

For the purposes of this CEMP, SSD 7348 describes an 'incident' as 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. SSD 7348 describes a 'non-compliance' as an occurrence, set of circumstances or development that is a breach of the consent.

3.5.1 Performance Objective

To ensure that any incident and/or non-compliance caused by or relating to the construction of the WNSLR is effectively responded to, and any resulting adverse environment and/or human health impact is promptly prevented or effectively managed.

3.5.2 Responsibility

The Contractor's Project Manager is responsible for ensuring that the appropriate management response and handling procedures are instigated and carried through in the event of an incident and/or non-compliance. All employees, contractors and subcontractors are to:

- Notify the Contractor's Project Manager who will notify the Environmental Representative (ER) of any hazard or potential hazard that may result in an incident and/or non-compliance, regardless of the nature or scale; and

- Take immediate action (where it is safe to do so) to prevent, stop, contain and/or minimise any adverse impact associated with an incident and/or non-compliance.

The induction and toolbox talks outlined in **Section 3.4** will be used to ensure all site employees, contractors and subcontractors are aware of and understand their obligations for incident and/or non-compliance response.

3.5.3 Notification Requirements

3.5.3.1 Incidents

Notification responsibilities for incidents that have caused or threatened to cause material harm to the environment are detailed in Section 148 of the *Protection of the Environment Operations Act 1997* (POEO Act). In summary, these are broadly categorised as:

Duty of an employee or any person undertaking an activity:

Any person engaged as an employee or undertaking an activity with regard to the WNSLR will, immediately after becoming aware of any potential incident (even if outside of normal business hours), notify the Contractor's Project Manager who will notify the ER of the incident and all relevant information about it. The Contractor's Project Manager will be available 24 hours a day, seven days a week and have the authority to stop or direct works.

Duty of an employer or occupier of the premises to notify:

The employer or occupier of the premises (in this case, the ER) on which the incident occurred, who is notified (or otherwise becomes aware of) of the incident, will immediately notify the relevant authorities about the incident and all relevant information.

Under the POEO Act, "relevant authority" means any of the following:

- The appropriate regulatory authority – the Environment Protection Authority (EPA);
- If the EPA is not the appropriate regulatory authority – the local authority for the area in which the pollution incident occurs (i.e. Council);
- NSW Public Health Unit;
- SafeWork NSW; and
- Fire and Rescue NSW.

Table 7 lists the contact details for these authorities. The person reporting the pollution incident will provide the following key details:

- Location of the pollution incident/emergency;
- Nature of the pollution incident/emergency;
- Their name and contact details; and
- Details of any required assistance.

Table 7 Regulatory Authority Contact List

Regulatory Authority / Stakeholder	Key Contact	Contact Details	
Department of Planning, Industry and Environment (DPIE)	Compliance Unit	1300 305 695 or 02 9228 6111 compliance@planning.nsw.gov.au	
Environment Protection Authority (EPA)	Environment Line	131 555 info@environment.nsw.gov.au	
	Head office (Sydney)	02 9995 5000	
Penrith City Council	Main switchboard	02 4732 777 council@penrith.city	
Water NSW	Main switchboard	1300 662 077 Customer.Helpdesk@waternsw.com.au	
	Incident Notification Number – 24 hours	1800 061 069	
NSW Public Health Unit	Sydney Local Health District	Business hours: 1300 066 055 After hours: 02 9515 6111	
SafeWork NSW	Incident Notification Hotline	131 050 Select Option 3 to report a “Serious Incident or Fatality” – this will result in the incident being recorded and the appropriate person being contacted.	
Emergency Services	NSW Police	131 444	In case of emergency – 000
	NSW Fire and Rescue	1300 729 579	
	NSW Ambulance Service	-	

In accordance with Condition D135 of Development Consent SSD 7348, once Goodman becomes aware of an incident Goodman is required to immediately (within 24 hours) provide a written incident notification via email to the DPIE and other relevant agencies of an incident, or potential incident, that causes (or may cause) harm to the environment. A detailed incident report is then to be provided to the DPIE within 30 days of the incident.

3.5.3.2 Non-Compliances

In accordance with Condition D136 of SSD 7348, the DPIE will be notified in writing to compliance@planning.nsw.gov.au within seven days of becoming aware of any non-compliance.

D137 and D138 of SSD 7348 states a non-compliance notification will 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 and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

3.5.4 Incidents and Non-Compliance Handling Procedure

Upon becoming aware of an incident and/or non-compliance, the procedure outlined below will be followed.

1. Preventative Action

Where possible and safe to do so, immediate action will be taken to prevent, stop, contain and/or minimise the environmental impact of the incident and/or non-compliance.

In the unlikely event that an incident and/or non-compliance requires the evacuation of the site, actions will be completed in accordance with evacuation procedures. All employees and contractors are to be made aware of the location of emergency assembly areas through site inductions, signage and regular toolbox talks.

2. Assistance

If adequate internal resources are not available and the incident and/or non-compliance threatens public health, property or the environment, it is essential that Fire and Rescue NSW be contacted by telephoning "000" for emergency assistance.

Contacting Fire and Rescue NSW does not negate the notification requirements in **Section 3.5.3**.

3. Notify

Under the provisions of the POEO Act, there is a duty to notify any incident that has caused or threatens to cause material harm to the environment and all relevant information about the incident. The specific duties to notify are outlined above in **Section 3.5.3**.

In the event of a serious incident or emergency, it is more than likely that Fire and Rescue NSW will take control and manage the required investigation and remedial activities. Any instructions issued will be strictly adhered to.

Condition D135 and Appendix 8 of Development Consent SSD 7348 requires that the DPIE and other relevant authorities be provided with a written incident notification via email within 24 hours after the incident.

A written notification will:

- Identify the development and application number;
- Provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);
- Identify how the incident was detected;
- Identify when the Applicant became aware of the incident;
- Identify any actual or potential non-compliance with conditions of consent;
- Describe what immediate steps were taken in relation to the incident;
- Identify further action(s) that will be taken in relation to the incident; and
- Identify a project contact for further communication regarding the incident.

Non-compliances will be notified in accordance with **Section 3.5.3.2**.

4. Investigate

Undertake immediate investigative work to determine the cause of the incident and/or non-compliance.

5. Remedial Action

Undertake appropriate remedial action to address the cause of the incident and/or non-compliance and mitigate any further environmental impact. In some instances, outside resources such as specialist contractors/consultants may be required.

6. Record

It is imperative that an honest assessment of the situation is carried out and documented in order to minimise the potential for similar events in the future. On this basis, every incident is to be recorded in an Incident Event Report (**Appendix G**). A copy of the completed report will be maintained for at least five years by Robson.

Condition D135 and Appendix 8 of Development Consent SSD 7348 requires that a detailed incident report be provided to the DPIE within 30 days of the incident occurring.

The Incident Event Report will include:

- A summary of the incident;
- Outcomes of an incident investigation, including identification of the cause of the incident;
- Details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and
- Details of any communication with other stakeholders regarding the incident.

All non-compliances are recorded in accordance with Condition D137 of SSD 7348.

7. Preventative Action

Once the incident and/or non-compliance has been suitably handled, appropriate measures will be identified and implemented to reduce the possibility of re-occurrence.

3.5.5 Incidents and Non-Compliance Register

An Incidents and Non-Compliance Register will be maintained during construction and will contain the following:

- A copy of the environmental incident and non-compliance notification requirements and handling procedure contained above in **Section 3.5.3** and **3.5.4**;
- Site evacuation procedures;
- A separate reference sheet containing the contact details for the contacts listed in **Table 5** and the contact details for the regulatory authorities listed in **Table 7**;
- Blank hard copies of the Incident Event Report; and
- Copies of all completed Incident Event Reports, which are to be maintained for at least five years after the event to which they relate.

3.5.6 Handling of Minor Environmental Incidents

There is the possibility of a minor environmental incidents occurring as part of this project. SLR have defined a 'Minor Environmental Incident' as an incident where there has been no potential or actual material harm to the environment. Examples may include excessive dust impacts sighted by the project team or a small contained hydrocarbon spills that do not leave a site boundary and are cleaned up without residual on-site environmental harm (RMS 2018).

Minor environmental incidents will still be handled under the process outlined in **Section 3.5.4** except there will be no requirement for government notification. All minor or major incidents will be recorded in the Incidents Register, with details of the events also included in the Environmental Representative Monthly Report. A minor incident does not constitute a non-compliance with the Development Consent.

3.6 Complaints Response and Handling Procedure

All complaints will be handled in accordance with the sections below and the *Community Communication Strategy* (CCS) (SLR 2019b).

3.6.1 Performance Objective

To ensure that all environmental complaints in relation to the construction of the WNSLR are promptly and effectively received, handled and addressed.

3.6.2 Responsibility

The Communications and Community Liaison Representative is responsible for ensuring that the appropriate management response and handling procedures are instigated and carried through in the event of an environmental complaint. The induction and toolbox talks outlined in **Section 3.4** will be used to ensure all site employees are aware of and understand their obligations for complaints response.

All employees who take receipt of a complaint, either verbal or written, are to immediately notify the Contractor's Project Manager, who will then contact the Communications and Community Liaison Representative.

3.6.3 Complaints Handling Procedure

Upon becoming aware of a complaint, the protocol outlined below will be followed.

1. Record and Acknowledge

Any employee who take receipt of a complaint, either verbal or written, are to immediately notify the Contractor's Project Manager who will then contact the Communications and Community Liaison Representative. The Contractor's Project Manager will be available 24 hours a day, seven days a week and have the authority to stop or direct works. All relevant contact details are available in **Table 5**.

In the normal course of events, the first contact for complaints will usually be made in person or by telephone.

The complainant's name, address and contact details, along with the nature of the complaint, must be requested. If the complainant refuses to supply the requested information, a note will be made on the form and complainant advised of this.

2. Assess and Prioritise

The Communications and Community Liaison Representative will prioritise all complaints by considering the seriousness of the complaint including risk to health and safety and will attempt to provide an immediate response via phone or email. This will be undertaken in accordance with the CCS (SLR 2019b).

3. Investigate

A field investigation will be initiated in an attempt to confirm details relevant to the complaint and the cause of the problem. Any monitoring information and/or records at and around the time of the complaint will be reviewed for any abnormality or incident that may have resulted in the complaint.

If the complaint is due to an incident, the notification requirements and handling procedures outlined in **Section 3.5.3** and **3.5.4** respectively will be followed.

4. Action or Rectify

Once the cause of the complaint has been established, every possible effort will be made to undertake appropriate action to rectify the cause of the complaint and mitigate any further impact. The Communications and Community Liaison Representative will assess whether the complaint is founded or unfounded and delegate the remediation of the issue to the Contractor's Project Manager for action, as required.

5. Respond to Complainant

The Communications and Community Liaison Representative will oversee the rectification of the issue and respond to the complainant once the issue has been resolved. The complainant will be provided with a follow up verbal response on what action is proposed within two hours during night-time works (between the hours of 6:00 pm and 10:00 pm) and 24 hours at other times. Where a complaint cannot be resolved by the initial or follow-up verbal response, a written response will be provided to the complainant within ten days.

6. Record

It is imperative that an assessment of the situation is carried out and documented in order to minimise the potential for similar complaints in the future. On this basis, every complaint received is to be recorded in the Complaint Enquiry Form (**Appendix H**). A copy of the completed form will be maintained for at least five years. The complaint will also be recorded in the Complaints Register, as per **Section 3.6.4**.

7. Preventative Action

Once the complaint has been suitably handled, appropriate measures will be identified and implemented to negate the possibility of re-occurrence. The Complaint Enquiry Form is not finalised until the preventative actions are completed and recorded on the form.

3.6.4 Complaints Register

A Complaints Register will be maintained during construction and will contain the following:

- A copy of the environmental complaint handling procedure contained in **Section 3.6.3**;
- A separate reference sheet containing the contact details listed in **Table 5**;
- Blank hard copies of the Complaint Enquiry Form (see **Appendix H**); and
- Copies of all completed Complaint Enquiry Forms, which are to be maintained for at least five years after the event to which they relate.

3.7 Dispute Resolution

In the event that a dispute arises between Goodman and Council or a public authority, in relation to an applicable requirement in this consent or relevant matter relating to the construction of the WNSLR, either party may refer the matter to the Planning Secretary for resolution. The Planning Secretary's determination of any such dispute will be final and binding on the parties.

In the case of a dispute between Goodman and a community member/complainant, either party may refer the matter to the DPIE and/or relevant regulatory authority for consideration, advice and/or negotiation. If the matter escalates, a third party mediator may be required. It should be noted that Condition D127g states 'as may be requested by the Planning Secretary, assist the Department in the resolution of community complaints'.

Additional information can be located in the CCS (SLR 2019b) attached as **Appendix I**.

4 Environmental Management Commitments

Environmental aspects with the potential to be impacted through the construction of the WNSLR are addressed in the following sub-sections. These issues have specific regulatory requirements imposed by SSD 7348 and/or are considered to have the highest potential to result in a non-compliance with a legislative requirement or generate community complaints. The tables in this section are a compliance management tool outlining how controls are to be implemented.

4.1 General

Table 8 lists the general environmental controls that will be implemented throughout the construction of the WNSLR to minimise the potential for adverse impacts on the local environmental and surrounding receptors.

Table 8 General Construction Environmental Management Controls

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Safe and unobstructed access will be provided for TransGrid plant and personnel to access the transmission towers, lines and easement on the Site, 24 hours a day, 7 days a week.	Robson	Ongoing	SSD 7348 Condition B21 and D30
All staff will comply with the requirements of TransGrid for any works in the TransGrid easement.			
TransGrid will be advised of any proposed amended or modified encroachment into the easement.	Goodman / Robson		
The requirements of Endeavour Energy for the provision of land for a new zone substation (as shown on the plans in the RTS) will be complied with	Robson		SSD 7348 Condition B22
Safe and unobstructed access will be provided for Water NSW plant and personnel to access the water pipelines corridor adjacent the site, 24 hours a day, 7 days a week.			SSD 7348 Condition B23
All staff will comply with the requirements of Water NSW for any works adjacent to or over, the water pipelines corridor.			
Water NSW will be advised of any proposed amended or modified encroachment into the water pipelines corridor.	Goodman / Robson		
All reasonable and feasible measures will be implemented to prevent and minimise, any material harm to the environment.	Robson	SSD 7348 Condition D1	
All demolition will be carried out in accordance with <i>Australian Standard AS 2601-2001 The Demolition of Structures</i> (Standards Australia 2001).		If required	SSD 7348 Condition D17
All plant and equipment will be maintained and operated in a proper and efficient manner.		Ongoing	SSD 7348 Condition D21

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All signage and fencing will be erected in accordance with the plans in the RTS.	Robson	Prior to commencing construction and ongoing	SSD 7348 Condition D43
All fencing along building frontages will be located behind the landscape setbacks and not along the front boundary. The fencing will be a maximum height of 2.1 metre and be an open style.			SSD 7348 Condition D44
The WNSLR will be constructed in accordance with the requirements of: <ul style="list-style-type: none"> • Council, the PCA and any approval issued under section 138 of the <i>Roads Act 1993</i> including the WAD • TfNSW for the bridge crossing of the future WSFL • Water NSW for the bridge crossing of the water pipelines corridor 		Ongoing	SSD 7348 Condition D46
The intersections of the WNSLR with Estate Road 1 and Lockwood Road will be constructed to the satisfaction of the Relevant Roads Authority.			SSD 7348 Condition D47
Works-as-executed drawings will be provided to Water NSW for the WNSLR bridge. The drawings will clearly show any changes to the bridge design or the works adjacent to the water pipelines corridor.		Following the completion of construction	SSD 7348 Condition D60
The WNSLR will be constructed within the hours outlined in Section 2.3 .		Ongoing	SSD 7348 Condition D70
All works on or adjacent to waterfront land will be carried out in accordance with the Department of Industry (2012) <i>Guidelines for Controlled Activities on Waterfront Lands</i> .			SSD 7348 Condition D87
Environmental Work Method Statements (EWMS) will be prepared and implemented.		Prior to commencing construction and ongoing	G36 Section 3.2.4
All monitoring records will be maintained to demonstrate compliance with the CEMP, including: <ul style="list-style-type: none"> • Site environmental inspection reports • Environmental monitoring data and • Internal and external audit reports • Reports of environmental incidents, environmental, associated actions taken, and follow-up actions • Minutes of management review meetings • Induction and training records 		For 5 years after completion date	G36 Section 3.11
The incidents and complaints management strategies contained within Sections 3.5 and 3.6 will be implemented to ensure that any incidents and/or complaints relating to the construction activities are promptly and effectively addressed.		Ongoing	CEMP Sections 3.5 and 3.6

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Construction employees and contractors will be suitably inducted and trained prior to commencing any work on site.	Robson	Prior to commencing construction and ongoing	CEMP Section 3.4
A Dial Before you Dig check will be undertaken prior to the removal of any old communications lines.		Prior to commencing construction	Water NSW request
If surveillance cameras are installed, signage will be erected to notify that surveillance cameras are operated on the site.		As required	
A Bridge Operation and Maintenance Manual will be provided the Water NSW following completion of construction.		Following the completion of construction	

4.2 Noise

Construction noise at the WNSLR will be managed in accordance with the CNVMP (SLR 2019d) prepared to fulfil Condition D73 and D74 of SSD 7348, attached as **Appendix J**.

Table 9 outlines the project specific Noise Management Levels (NMLs) to be adhered to during the construction of the WNSLR as outlined in the CNVMP (SLR 2019d).

Table 9 Project Specific Construction Noise Management Levels

Location	Receiver Type	LAeq(15minute) Construction NMLs (dBA)	
		Standard Construction Hours ¹	Highly Noise Affected
Erskine Park Residential	Residential	47	75
Emmaus Village Residential	Residential	49	
Kemps Creek Residential	Residential	44	
Any	Industrial	External 75 when in use	n/a
Any	Commercial	External 70 when in use	
Any	School ²	External 55 when in use	

Note 1: Daytime standard construction hours 7:00 am to 6:00 pm (Monday to Friday), 8:00 am to 1:00 pm (Saturday)

Note 2: External criteria equivalent to internal criteria plus 10 dB.

The environmental management controls in **Table 10** will be implemented to minimise the potential for adverse noise emissions from the construction of the WNSLR.

Table 10 Environmental Management Controls for Noise

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Project Planning			
Less noise and vibration intensive construction techniques to rock breaking and concrete sawing will be used.	Robson	Ongoing	Best practice
Works will be completed during standard daytime construction hours outlined in Section 2.3 .			
Truck routes to site will be in accordance with the approved Construction Traffic Management Plan.			

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Scheduling			
Respite offers will be considered where high-noise works are predicted to exceed 75 dBA for residential receivers. For schools and retirement villages (Emmaus Village) a lower level of 65 dBA will be used to account for the sensitive daytime uses of these receivers. Respite offers will be considered for high-vibration works where the works are undertaken within the human comfort minimum working distances for all receiver types. Consultation with these receivers will be undertaken to determine appropriate respite periods, such as exam periods for schools.	Communications and Community Liaison Representative	Ongoing	SSD 7348 Condition D73
High-noise or vibration generating works will be carried out in continuous blocks no longer than three hours in length, with a minimum respite period of one hour between each block. 'Continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing these works. High-noise or vibration generating works conducted outside standard construction hours (where approved) will be limited to no more than two consecutive nights except where there is a Duration Respite (see below). For night-works these periods will be separated by no less than one week, and limited to six nights per month. Where possible, high-noise and vibration generating works will be completed before 11:00 pm.			
Duration Respite will be considered where it may be beneficial to the sensitive receivers to increase the duration of blocks of work or number of consecutive periods in order to complete the works more quickly. The project team will engage with the community where Duration Respite is considered in accordance with the CCS.			
Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night time period, any operational noise benefits from the works (where applicable) and contact telephone numbers will be undertaken in accordance with the CCS.			
Site Layout			
Compounds and worksites will be designed to promote one-way traffic and minimise the need for vehicle reversing.	Robson	Ongoing	Best practice and CNVMP Section 6
Where practicable, work compounds, parking areas, and equipment and material stockpiles will be positioned away from noise-sensitive locations and take advantage of existing screening from local topography.			

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Equipment that is noisy will be started away from sensitive receivers.	Robson	Ongoing	Best practice and CNVMP Section 6
Training			
Training will be provided to all personnel on noise and vibration requirements for the project. Inductions and toolbox talks to be used to inform personnel of the location and sensitivity of surrounding receivers.	Robson	Ongoing	Best practice and CNVMP Section 6
Plant and Equipment Source Mitigation			
<p>All construction plant and equipment used on Site will be, in addition to other requirements:</p> <ul style="list-style-type: none"> a) Fitted with properly maintained noise suppression devices in accordance with the manufacturer's specifications; b) Regularly inspected and maintained in an efficient condition; c) Operated in a proper and efficient manner. 	Robson	Ongoing	SSD 7348 Condition D21 and G36 Section 4.6
Noisy plant or processes will be replaced by less noisy alternatives. This is particularly important for piling, for example. Bored piles generate less noise than impact-driven or percussive piling methods which will be avoided if possible.			Best practice and CNVMP Section 6
Where practicable, tonal reversing alarms (beepers) will be replaced with alternative silent measures (such as flashing lights) or non-tonal alarms (squawkers) on all equipment (subject to occupational health and safety requirements).			
Noisy equipment will be sited 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.			
Noise generating equipment will be regularly checked and effectively maintained, including checking of hatches/enclosures regularly to ensure that seals are in good condition and doors close properly against seals.			
Dropping materials from a height will be avoided.			
Loading and unloading will be carried out away from noise sensitive areas.			
Trucks will not queue outside residential properties. Truck drivers will avoid compression braking as far as practicable.			
Truck movements will be kept to a minimum, i.e. that trucks are fully loaded on each trip.			

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Screening			
Purpose-built acoustic screening or enclosures will be installed around long-term fixed plant such as generators in site compounds.	Robson	Ongoing	Best practice and CNVMP Section 6
Community Consultation			
Notifications will be provided to the affected community where high impacts are anticipated or where out of hours works are required. Notification will be a minimum of seven working days. Refer to the CCS.	Communications and Community Liaison Representative	Ongoing	Best practice and CNVMP Section 6
Where complaints are received, work practices are to be reviewed and feasible and reasonable practices implemented to minimise any further impacts. See Section 3.6.			
Monitoring			
Noise and/or vibration monitoring will be conducted (as appropriate) when noise/vibration intensive works are being undertaken in close proximity to sensitive receivers.	Robson	Ongoing	Best practice and CNVMP Section 6
Noise and/or vibration monitoring will be conducted (as appropriate) in response to any complaints received to verify that levels are not substantially above the predicted levels.			
See Section 5 for full details of monitoring requirements.			
EIS Measures			
Construction hours will be limited to 7:00 am - 6:00 pm Monday to Friday and 8:00 am - 1:00 pm Saturdays (see Section 2.3) as detailed in the CNVMP.	Robson	Ongoing	EIS mitigation commitment and CNVMP Section 6
Where construction noise levels are predicted to be above the NMLs, all feasible and reasonable work practices will be investigated to minimise noise emissions.			
Construction works will be conducted during Standard Construction Hours, with out of hours work minimised as far as feasible and reasonable, and undertaken in accordance with Condition D71.			
Locations for vibration intensive equipment will be reviewed during the planning of construction works adjacent to the most affected receivers.			

4.3 Vibration

Vibration during the construction of the WNSLR will be managed in accordance with the CNVMP (SLR 2019d), attached as **Appendix J**.

The key vibration criteria is listed in Condition D 76: *Vibration caused by construction works on the site, as measured at any residence or structure outside the site, must be limited to:*

- a) *for structural damage, the latest version of DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures (German Institute for Standardisation, 1999); and*
- b) *for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: a technical guideline (DEC, 2006) (as may be updated or replaced from time to time).*

The vibration dose values (VDVs) recommended in the EPA's *Assessing Vibration: a technical guideline* (2006) for vibration of an intermittent nature are listed in **Table 11**.

Table 11 Acceptable Vibration Dose Values for Intermittent Vibration

Location	Daytime ¹		Night-time ¹	
	Preferred Value	Maximum Value	Preferred Value	Maximum Value
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

Note 1: Daytime is 7:00 am to 10:00 pm and night-time is 10:00 pm to 7:00 am.

The recommended safe working distances for vibration intensive construction plant are listed in **Table 12**. These recommendations are for the practical management of potential vibration to minimise the likelihood of cosmetic damage to buildings and disturbance or annoyance in humans.

Table 12 Recommended Safe Working Distances for Vibration Intensive Plant

Plant Item	Rating / Description	Minimum Distance		
		Cosmetic Damage		Human Response (NSW EPA Guideline) ¹
		Residential and Light Commercial (BS 7385) ¹	Heritage Items (DIN 4150 Group 3) ²	
Vibratory Roller	< 50 kN (Typically 1-2t)	5 m	11 m	15 m to 20 m
	< 100 kN (Typically 2-4t)	6 m	13 m	20 m
	< 200 kN (Typically 4-6t)	12 m	15 m	40 m
	< 300 kN (Typically 7-13t)	15 m	31 m	100 m
	> 300 kN (Typically 13-18t)	20 m	40 m	100 m
	> 300 kN (Typically > 18t)	25 m	50 m	100 m
Small Hydraulic Hammer	300 kg – 5 to 12t excavator	2 m	5 m	7 m
Medium Hydraulic Hammer	900 kg – 12 to 18t excavator	7 m	15 m	23 m
Large Hydraulic Hammer	1600 kg – 18 to 34t excavator	22 m	44 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	5 m to 40 m	20 m
Pile Boring	≤ 800 mm	2 m (nominal)	5 m	4 m
Jackhammer	Hand held	1 m (nominal)	3 m	2 m

Note 1: Criteria reference from RMS (2016) Construction Noise and Vibration Guideline (CNVG).

Note 2: Criteria reference from German Institute for Standardisation (Deutsches Institut für Normung) (1999) DIN 4150 – Structural vibration - Effects of vibration on structures.

The environmental management controls in **Table 13** will be implemented to minimise the potential for adverse vibration impacts from the construction of the WNSLR.

Table 13 Environmental Management Controls for Vibration

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Vibration			
Where works are required within the minimum working distances, vibration monitoring will be undertaken to confirm that vibration is within acceptable levels.	Robson	Ongoing	Best practice and CNVMP Section 6
Where works are required within the cosmetic damage minimum working distances, building condition surveys will be completed before and after the works to ensure no cosmetic damage has occurred.			
Vibratory compactors will not be used closer than 30 m from residential buildings unless vibration monitoring confirms compliance with the vibration criteria.			SSD 7348 Condition D77

Measure	Person Responsible	Timing / Frequency	Reference / Notes
A vibration limit of 15 mm/s PPV will be applied to the Water NSW pipelines which pass under the WNSLR.	Robson	Ongoing	PSM Vibration Assessment PSM1541-381L (and/or requested by Water NSW)
Any fill within the Water NSW pipeline corridor or within 50 m of the Water NSW pipelines (whichever is greater) will be placed and compacted using a static roller with no vibration.			
Dilapidation surveys of the pipelines will be carried out prior to the commencement and after completion, at a minimum, of any work within the Water NSW corridor or within 50 m of the Water NSW pipelines (whichever is greater). This will include as a minimum, collecting photos of the conditions of the site and existing pipeline and foundations, and mapping/identifying any existing issues or cracks, etc, prior to, during, and after the works.			
During construction works within the Water NSW corridor or within 50 m of the Water NSW pipelines (whichever is greater), and excavation/cutting of the southeast batter rock, vibration will be monitored in accordance with the procedures outlined in Section 5 .			
Vibration intensive equipment will not be used directly over the concrete encased sections of the Water NSW pipelines.			
Water NSW will be immediately notified in the event of any impact to the pipeline so that they can inspect the pipes prior to confirming whether any remedial work is required.			
Where there is a risk that vibration activities may cause damage to nearby structures and buildings or if these are located within the distance from the construction activity specified in Annexure G36/E, a building condition inspection will be undertaken at least three weeks before the construction activity commences, in accordance with the G36 requirements.		Before and after any vibration activities within minimum distances	G36 Section 4.7
The Building Condition Inspection Reports required by G36 will contain photographs of the inspected properties and include details of the inspectors' qualification and expertise, together with a list of any identified defects, where relevant. The reports will be submitted to the owner of each property and to AT&L and Goodman before the commencement of any activities as outlined in the Hold Point in Section 4.7 of G36.			
A copy of the Building Condition Inspection Reports and CNVMP will be submitted to AT&L and Goodman at least 10 working days prior to commencement of piling, excavation by hammering or ripping, compaction, demolition operations, or any activity which may cause damage through vibration.			

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Carry out a Building Condition Inspection for each public utility, structure and building within the distance from the appropriate activity listed below; however, where the risk of damage to an item is assessed to be very low, the requirement for a Building Condition Inspection may be waived with AT&L and Goodman’s agreement.	Robson	Before and after any vibration activities within minimum distances	G36 Annexure G36/E

4.4 Air Quality

In accordance with Condition D100 of SSD 7348, a Construction Air Quality Management Plan (CAQMP) has been prepared by SLR (2019a) and is attached as **Appendix K**.

The CAQMP will be implemented during the construction of the WNSLR to ensure that acceptable levels of amenity are maintained for surrounding residents and the relevant ambient air quality criteria are complied with for particulate matter at surrounding receptor locations.

The environmental controls in **Table 14** will be implemented to minimise the potential for adverse dust emissions and impacts during the construction.

Table 14 Environmental Management Controls for Air Quality

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All reasonable steps to minimise dust generated will be undertaken during construction.	Robson	Ongoing	SSD 7348 Condition D98
Exposed surfaces and stockpiles will be suppressed by regular watering.			SSD 7348 Condition D99
All trucks entering or leaving the Site will have their loads covered.			
All trucks will not track dirt onto the public road network.			
All public roads used by trucks associated with the construction will be kept clean.			
Land stabilisation works will be carried out progressively on site to minimise exposed surfaces.			SSD 7348 Condition D102
Construction of the WNSLR will not cause or permit the emission of any offensive odour, as defined in the POEO Act.			
The requirements of the POEO Act and any conditions of licences, notifications, approvals or permits will be complied with in relation to maximum air pollutant levels.			
All construction activities will be planned and carried out to avoid or minimise the generation of dust and vehicle emissions.			
All sensitive receivers likely to be affected will be notified prior to commencement of any work that may have an adverse impact on local air quality.	Communications and Community Liaison Representative / Robson	At least 5 days prior	G36 Section 4.4
Additional air quality mitigation controls will be implemented and the CAQMP will be amended accordingly if air quality monitoring indicates that mitigation measures are not effective or if dust complaints are received.	Robson	As required	

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Air quality monitoring will comply with the <i>Approved Methods for Sampling and Analysis of Air Pollutants in NSW</i> (EPA 2007).	Robson	Ongoing	G36 Section 4.4
Dust generating activities in areas close to receptors will be minimised.		Prior to commencing construction and ongoing	CAQMP Section 8
Site fencing, barriers and scaffolding will be kept clean using wet methods.		Ongoing	
Materials that have a potential to produce dust will be removed from site as soon as possible, unless being re-used on site. If materials are being re-used they will be covered as per condition below.			
Stockpiles that will be in place for more than 20 days as well as any stockpiles that are susceptible to wind or water erosion will be covered or otherwise protected from erosion within 10 days of forming each stockpile. Temporary stabilisation of disturbed surfaces will be undertaken within two weeks.			
Stationary trucks will switch off engines if idling time on-site is likely to exceed 5 minutes.			
Vehicle speed limit restrictions will be implemented on site, including: <ul style="list-style-type: none">General - 20km/hHigh risk area - 10km/hHaul routes - 50km/h			
Truck queuing and unnecessary trips will be minimised through logistical planning.			
Only cutting, grinding or sawing equipment fitted with suitable dust suppression systems, such as water sprays will be used.			
Adequate water supply will be available on the site for effective dust/particulate matter suppression/ mitigation (non-potable water, potable water if required).			
Water carts will be used on unsealed roads to reduce dust emissions.			
Equipment will be readily available on site to clean any spillages.			
Works will not be carried out during strong winds or in weather conditions where high levels of airborne particulates are likely. Continual monitoring of wind speed and direction will be undertaken to guide this decision.		Continuously and during high winds	

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
No waste materials, timbers or any other combustible materials will be burned on site.	Robson	Ongoing	CAQMP Section 8
Vehicles transporting waste or other materials that have a potential to produce odours or dust will be covered during transportation.			
Only the minimum area necessary will be disturbed at any one time.			
Rehabilitation of disturbed areas will be undertaken progressively and as soon as practicable.		Ongoing	
Rehabilitation of disturbed surfaces will be undertaken within 20 days of final construction levels.		Within 20 days of final construction levels	
If unanticipated strong odours or significant dust emissions are noted on site, related works will be stopped and the Contractor’s Project Manager will be contacted.		Ongoing	
Excavation works and vehicle loading/unloading will be undertaken when weather conditions are favourable (i.e. receptors are upwind from the works).			
Sand and other aggregates will be stored in bunded areas and are not allowed to dry out.			
Water-assisted dust sweeper(s) will be used on the access and local roads to remove any material tracked out of the site.			
Dry sweeping of large areas will be avoided.			
Effective water suppression will be used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed.			
Any biological debris will be bagged and removed or materials damped down before demolition.			
A wheel washing and/or cattle grid system will be utilised.		CAQMP Section 8 and G38 Section 2	

4.5 Traffic

Construction traffic will be managed in accordance with the Construction Traffic Management Plan (CTMP) (Ason 2019) prepared to fulfil Condition D65 of SSD 7348 and is attached as **Appendix L**.

The CTMP seeks to minimise traffic impacts on the surrounding road network, ensure safety and efficiency for workers, pedestrians and other road users, and provide information regarding the construction vehicle access routes and any changed road conditions. In response feedback received from RMS during consultation, use of Mamre Road will be avoided in direct response to addressing this concern. WaterNSW have approved this access.

Construction-related traffic will be made up of both heavy and light vehicle movements. **Table 15** provides a summary of the estimated daily construction vehicle movements, as listed in the CTMP (Ason 2019).

Table 15 Daily Construction Vehicle Movements

Weeks	Light Vehicles	Heavy Vehicles
1 – 12	310	696
13 – 31	370	620
32 – 50	430	568

The environmental management controls in **Table 16** will be implemented to ensure road safety and network efficiency during construction.

Table 16 Environmental Management Controls for Traffic

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The internal estate roads and intersections will be constructed to accommodate the turning path of a B-Double, to the satisfaction of the Relevant Roads Authority.	Robson	Ongoing	SSD 7348 Condition D67
Construction will not result in any vehicles queuing on the public road network.			SSD 7348 Condition D69
Heavy vehicles will not be parked on local roads or footpaths in the vicinity of the Site.			
All vehicles will be wholly contained on site before being required to stop.			
All loading and unloading of materials will be carried out on Site.			
All trucks entering or leaving the Site will have their loads covered and will not track dirt onto the public road network.			
All endeavours will be undertaken to limit vehicular movements with the easement areas, wherever practicable.			CTMP Section 3.1.4

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
No vehicle circulation will be undertaken within 5 m of any transmission structure or guy-wires.			
All suppliers/haulage contractors will have Vehicle Movement Plans issued at supply agreement stage.	Robson	During the supply agreement stage	CTMP Section 3.1.5
When placing all orders, access restrictions will be notified to dispatch and included on delivery docket.		Ongoing	
Deliveries will be scheduled for outside restricted times, wherever possible.			
Signage will be installed as required by the CTMP.		Prior to commencing construction and ongoing	
During bulk importation periods, there will be a gate person tracking loads in/out and communicating and monitoring access/egress routes accordingly.			
Any vehicles found to be in breach will undergo a driver induction on the spot and their manager/dispatch advised. Repeat offenders will be prevented from returning to site.		As required	
Heavy vehicle breaches during school zones will be captured and reported to DPIE at monthly intervals.		Monthly	
All drivers will adhere to the Driver Code of Conduct outlined in Section 4.2 of the CTMP.		Ongoing	CTMP Section 3.2.1
All deliveries and materials handling will occur on site at all times.			CTMP Section 3.2.2
An application to Council will be submitted in the event that any special or discreet work activities require the use of kerbside parking for the purposes of a Works Zone.		As required	CTMP Section 3.2.3
Man-proof fencing will be provided along all site frontages accessible by the public to prevent unwanted pedestrian access.		Prior to commencing construction and ongoing	CTMP Section 3.2.4
Man-proof fencing will be provided along all site frontages accessible by the public to prevent unwanted cyclist access.			CTMP Section 3.2.5
Any Traffic Control Plans (TCPs) will be prepared by an accredited person, in accordance with the <i>Traffic Control at Work Sites Manual</i> (RMS 2018e) and AS 1742.3.		As required	CTMP Section 3.2.6
Relevant truck routes and access locations will be adhered to during construction.			CTMP Section 3.4.2
The implementation of each access route will be done so in accordance with any and all conditions of consent received by the RMS (now TfNSW).		Ongoing	
A clear path for Water NSW emergency maintenance vehicles will be maintained at all times.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Any use of the Water NSW service road will be coordinated so that regular pipeline maintenance is not conducted when large deliveries to the central area are required.	Robson	Ongoing	CTMP Section 3.4.2
Temporary contractor parking areas will be provided within the work area or on either side of the Water NSW pipeline. Irregular visitors will be encouraged to use the primary contractor parking areas.		As required	CTMP Section 3.4.3
Drivers will be responsible and accountable for their actions when operating a company vehicle or driving for the purposes of work.	Drivers	Ongoing	CTMP Section 4.3
The highest level of professional conduct will be displayed when driving a vehicle at work.	Drivers / Robson		
All drivers will have a current driver licence for the class of vehicle they are driving, and this licence is to be carried at all times.			
Management will be immediately notified if their drivers licence has been suspended, cancelled, or has had limitations applied.	Drivers		
All traffic and road legislation will be complied with when driving.			
Hazards will be assessed while driving.			
The oil, tyre pressures, radiator and battery levels of all company vehicles will be checked.	Drivers / Robson		
All drivers will drive within the legal speed limits, including driving to the conditions.	Drivers		
All drivers will not drive outside of the approved Heavy Vehicle routes. Heavy Vehicles will adhere to the routes outlined in Section 3 of the CTMP.	Drivers / Robson		
All drivers will obey the weight, length and height restrictions imposed by the National Vehicle Regulator, and other Government agencies.			
Drivers will be cognisant of the noise and emissions requirements imposed within the EIS, and in a broader sense, the NSW/ Australian Road Rules.	Drivers		
Drivers will not queue on roads unless a prior approval has been sought.			
No tracked vehicles will be driven on a paved road.			
Drivers will not drive under the influence of alcohol or drugs, including prescription and over the counter medication if they cause drowsiness – to do so will merit disciplinary measures.	Drivers / Robson		
A safety seat belt will be worn at all times when in any vehicle.	Drivers		

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All drivers will avoid distractions when driving i.e. the driver will adjust car stereos/mirrors etc. before setting off, or pull over safely to do so.	Drivers	Ongoing	CTMP Section 4.3
All near-hits, crashes and scrapes will be reported to management, including those that do not result in injury.	Drivers / Robson		
All infringements will be reported to management at the earliest opportunity.			
Vehicle defects will be reported to management.		Prior to the next vehicle use	
The authorised site access and egress route will be followed.	Drivers / Robson	Ongoing	
The speed limits within the construction site will be adhered to.	Robson		
Pre-commencement checks will be undertaken for all new traffic related plant arriving on site.		Prior to first use	
Prestart inspections will be completed for all traffic related plant and equipment currently on-site.	Drivers / Robson	Daily	CTMP Section 4.4
All construction plant will be fitted with a flashing light, fire extinguisher and reverse alarms.	Robson	Prior to first use	
All operators onsite will have a current verification of competency (VOC) for their current driver’s licence of the appropriate class.		Ongoing	
All maintenance requirements will be completed.			
Appropriate driver training or re-training will be arranged (where required), including: <ul style="list-style-type: none">Operator assessment as part of all inductionsRegular Toolbox talks on safety features, managing fatigue, approved heavy routes, driver responsibility and drink-driving (see Section 3.4)			
Management will not cover or reimburse staff speeding or other infringement notices.			
Only legal use of mobile phones in vehicles while driving will be undertaken.			
Improved fuel efficiency will be encouraged by: <ul style="list-style-type: none">Use of other transport modes or remote conferencing, whenever practicalProviding training on, and circulating information about, travel planning and efficient driving habits			
If a vehicle crash occurs, the vehicle will be stopped as close as possible to the scene without hindering traffic.	Drivers / Robson	Following a vehicle crash	CTMP Section 4.5
If a vehicle crash occurs, the list of information listed in Section 4.5 of the CTMP will be recorded.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The CTMP will be reviewed in accordance with Section 6.1 of the CTMP.	Robson	As required	CTMP Section 6.1

4.6 Water and Soil Management

The following documents have been prepared to ensure appropriate soil and water management during the construction of the WNSLR:

- QA Specification G36 – Environmental Protection (RMS 2018b) – provides describes an environmental protection management process to be implemented by Robson and Goodman during the construction of the WNSLR.
- QA Specification G38 – Soil and Water Management (RMS 2018c) – sets out the requirements for preventing water pollution, minimising soil erosion and controlling sedimentation on work sites.
- Soil and Water Management Plan (SWMP) (Robson 2019c) – prepared in accordance with G38 and attached as **Appendix M**. The purpose of the SWMP is to describe how Robson proposes to manage and minimise soil and water impacts during the construction of the WNSLR.
- Erosion and Sediment Control Plan (ESCP) is included as Appendix A of the SWMP (Robson 2019c) – prepared to address Conditions D80 and D81 of SSD 7348 and G38. The ESCP aims to reduce the potential for risk of environmental impacts caused by erosion and sedimentation associated with project activities.
- Salinity Management Plan (Pells Sullivan Meynink 2015) – prepared in accordance with WSROC's *Salinity Code of Practice* (2004) to provide controls for the potential impacts of salinity during construction. A copy of the Salinity Management Plan is attached as **Appendix N**.
- Fill Importation Protocol (FIP) (AECOM 2019a) which addresses Condition D79 of SSD 7348 and attached as **Appendix O**. The FIP aims to ensure that materials imported to the site are suitable for commercial / industrial land use.

While these documents should be referred to for specifics, the environmental management controls are summarised in **Table 17**.

Table 17 Environmental Management Controls for Water and Soil

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
General			
Construction will comply with section 120 of the POEO Act, which prohibits the pollution of waters.	Robson	Ongoing	SSD 7348 Condition D82
All works on or adjacent to waterfront land will be carried out in accordance with the Department of Industry's (2012) <i>Guidelines for Controlled Activities on Waterfront Lands</i> .			SSD 7348 Condition D87
The rehabilitation of disturbed areas will be undertaken progressively as construction stages are completed and in accordance with; <ul style="list-style-type: none"> • Procedures detailed in the Blue Book Volume 1 (Landcom 2004) and 2D (Landcom 2008) • Landscape Design Guideline (RMS 2018a) • Guideline for Batter Surface Stabilisation Using Vegetation (RMS 2015) 			G36 Section 4.16, G38 Section 3.1, SWMP Section 6 and Appendix A, RMS R178 and RMS R179

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Ancillary areas such as site compounds, material storage areas, access routes and haul roads, stockpile areas, construction sediment basins, etc. will be progressively restored to a stable, vegetated condition similar to that existing before disturbance, unless authorised otherwise.	Robson	Prior to construction completion	G36 Section 4.16 and SWMP Section 6
Tannins will be managed in accordance with the <i>Management of Tannins from Vegetation Mulch</i> (RMS 2012)		Ongoing	Best practice
Water			
The stormwater system will be constructed in accordance with Condition D83 of SSD 7348.	Robson	Ongoing	SSD 7348 Condition D83
If groundwater is intersected during construction the following will be undertaken: <ul style="list-style-type: none">Obtain the necessary water licences or approvals from Natural Resource Access Regulator (NRAR)Develop a Groundwater Management Plan (GMP) for the testing, dewatering, storage, movement and treatment of groundwater, to the satisfaction of NRAR	Goodman / Robson	If required	SSD 7348 Condition D86
Irrigation and toilet flushing will be plumbed to rainwater tanks.	Robson	Ongoing	SSD 7348 Appendix 7
Consideration will be given to other possible rainwater reuse opportunities such as for truck washing.			
Gross Pollutant Trap (GPT) will be installed within each development site on the final downstream stormwater pit prior to discharge.			
Clean and dirty water runoff will be adequately separated to avoid mixing where possible through the use of diversions, clean water drains, and the early installation of permanent drainage infrastructure.			G38 Section 2.2, and SWMP Section 6 and Appendix A
Water quality management will be undertaken in accordance with Section 3.3 of G38.			G38 Section 3.3, and SWMP Section 6 and Appendix A
Site dewatering will be undertaken in accordance with Section 3.4 of G38.			G38 Section 3.4, and SWMP Section 6 and Appendix A

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Works in waterways will be scheduled for periods of predicted low flow to minimise impacts and will be undertaken in accordance with <i>Technical Guideline: Temporary Stormwater Drainage for Road Construction</i> (RMS 2011).	Robson	Ongoing	G38 Section 3.7, and SWMP Section 6 and Appendix A
Disturbance of natural drainage patterns will be avoided. Where these are disturbed or altered, appropriate artificial drainage will be installed.		As required	Salinity Management Plan Section 5.5
Stormwater and surface water will be managed to restrict infiltration.		Ongoing	
Temporary water retaining structures used during construction will be managed to restrict infiltration.			
Stormwater and surface water infrastructure will be constructed to minimise the likelihood of leakage.			
Surface water runoff will be directed around all exposed surfaces, temporary stockpiles and landscaped areas.			
Erosion and Sediment Control			
The ESCP will be implemented to ensure stormwater flows do not increase in any downstream areas.	Robson	Prior to commencing construction and ongoing	SSD 7348 Condition D81
EWMS will be prepared and implemented to manage soil and water impacts			G36 Section 3.2.4, G38 Section 3.7, and G40 Section 1.2.4
The locations of site compounds, access tracks, stockpile sites and temporary work areas will be placed to minimise erosion.			G38 Section 3.1, SWMP Section 6 and Appendix A, and G40 Section 2.4
Construction will be programmed to minimise the duration and extent of soil that is left exposed.		Ongoing	G38 Section 3.1, SWMP Section 6 and Appendix A, and G40 Section 2.2
Management and procedures for site stabilisation will be in accordance with the primary ESCP attached as Appendix A of the SWMP.			G36 Section 4.16, G38 Section 3.1, and SWMP Section 6 and Appendix A
Stabilisation of areas exposed areas will be undertaken (including stockpiles and batters) by covering with geotextile fabric, stabilised mulch, soil binder or spray grass etc.			On areas exposed for more than 2 weeks

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Catch drains and diversion banks will be installed and lined in accordance with the requirements of Specification RMS R11 before earthworks commence.	Robson	Prior to commencing construction and ongoing	G38 Section 3.1, and SWMP Section 6 and Appendix A
Scour protection will be installed at the base of permanent and temporary drainage outlets.			
Drains will be constructed to direct runoff from disturbed areas to sediment basins or to areas with adequate sediment trapping/filtering devices and away from watercourses. Berms at top of batter and batter chutes with check dams will be progressively formed and maintained on fill formations.		Prior to commencing construction and ongoing	
Sediment will be filtered prior to water entering any pit.			
Re-vegetation of the Site will be staged as work proceeds, progressively undertaking topsoiling and vegetation work as specified in RMS R178.		Ongoing	
Control measures will be implemented at construction access points to minimise dirt and mud tracking. Any material transported onto road surfaces to be removed.		Daily and before rainfall	
All temporary erosion and sediment control devices will not be removed until the permanent measures are sufficiently established.		Ongoing	
Woven polypropylene and cotton/geotextile thread with a flow rate >110 litres/m ² /sec to AS 3706.9 will be used as the fabric when installing sediment fences.		As required	
Prior to forecast storm events, rainfall greater than 10mm or flooding events: <ul style="list-style-type: none"> The site will be inspected to ensure that all erosion/sedimentation and stabilisation controls are in place and in effective working order All work in the vicinity of flood-prone areas will cease and all loose materials and waste will be collected If there is a possibility that work sites could be flooded, action will be taken to prevent any environmental incidents such as potential pollution incidents and protecting disturbed ground from erosion, including relocating all materials that could cause harm onto higher ground and away from flood prone areas 		Prior to forecast storm events, ≥10mm rain or flooding events	
Operational sediment basins will be designed and constructed in accordance with Section 3.2.1 of G38.		Ongoing	G38 Section 3.2.1, and SWMP Section 6 and Appendix A

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Sediment Retention Basins will be designed and constructed in accordance with Section 3.2.2 of G38.	Robson	Ongoing	G38 Section 3.2.2, and SWMP Section 6 and Appendix A
Inlets, Outlets and Spillways will be designed and constructed in accordance with Section 3.2.3 of G38.			G38 Section 3.2.3
Suitable all-weather access will be constructed and maintained to sediment basins to allow for basin testing, treatment, discharge and maintenance.		Prior to commencing construction	G38 Section 3.2.4, and SWMP Section 6 and Appendix A
Sediment basins will be cleaned. Sediment will be disposed of so that it will not be conveyed back into the construction areas, into watercourses or off site.		When sediment exceeds 60% of the sediment storage zone	G38 Section 3.2.4
All construction sediment retention basins and sediment traps will be removed before completion, but not before all upstream areas have been vegetated or otherwise stabilised.		At the completion of construction	G38 Section 3.2.5
<p>The ground disturbed by the construction of the sediment basins/traps will be restored to a similar condition to that previously existing and includes:</p> <ul style="list-style-type: none"> Removal of all redundant mattresses from the inlets and spillway(s) and their subsequent burial into the basin area or their use as scour protection or their removal from Site Spreading and compaction of the embankment material into the basin area Removal of access roads <p>Disturbed ground will be compacted to at least the relative density of the material in the ground adjacent to it.</p>		Ongoing	
Erosion control and sediment capture measures will be installed prior to stockpiling material.		Prior to stockpiling material	G38 Section 3.5
Stockpiles will be located outside of the tree protection zone of trees or native vegetation identified for retention. The tree protection zone will be delineated in accordance with AS 4970.		Ongoing	G38 Section 3.5, and SWMP Section 6 and Appendix A
Stockpiles will be located in areas of low ecological or heritage significance.			
Stockpiles will be located away from sensitive receivers, at least 5 m from likely areas of concentrated water flows and at least 10 m from waterways that are classified as Class 1 and Class 2.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Stockpiles and material will not be located within the 1 in 10 year ARI floodplain.	Robson	Ongoing	G38 Section 3.5, and SWMP Section 6 and Appendix A
Height of stockpiles to be limited (where possible and space is available) especially near sensitive receptors. Slopes will be no steeper than 2:1.			
Stockpiles that will be in place for more than 20 days as well as any stockpiles that are susceptible to wind or water erosion will be covered or otherwise protected from erosion within 10 days of forming each stockpile.		Within 10 days of forming stockpile	
Topsoil that is not contaminated by noxious weeds will be kept in stockpiles for later spreading on fill batters and other areas. Other material may also be stockpiled but kept separated from the topsoil stockpiles.		Ongoing	
Measures to prevent the growth of weeds in topsoil stockpiles will be implemented.			
If any stockpile site is to be located on private land, an approved notice under s.143 of the POEO Act will be obtained from the landholder prior to commencement of stockpiling.		Prior to stockpiling	
Erosion and sediment controls will be checked and maintained on a regular basis and after a rain event of $\geq 10\text{mm}$ (including clearing of sediment from behind controls). Rectify any defects.		Weekly, before extended shut down or within 3 hours (during work hours) or 24 hours (outside of work hours) following $\geq 10\text{mm}$ rain or prolonged rainfall	G38 Section 4 and SWMP Section 6
Salinity			
Vegetation cover will be established and maintained on permanent batters to control erosion.	Robson	As soon as practical upon completion	Salinity Management Plan Section 5.2
The final surface of all areas of the development will be graded to prevent the ponding of surface water.		Ongoing	
Subsoil drainage will be considered for areas where the designer considers accumulation of groundwater may occur. We do not consider that any significant such areas are likely at this site.		As required	
Roads, footpath and hardstand surfaces will be graded to prevent ponding of surface water at locations where this can result in infiltration into the underlying soils (e.g. pavement joints).		Ongoing	Salinity Management Plan Section 5.4

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Connections between the roads, footpath and hardstand surfaces and the surface water and stormwater drainage infrastructure will be constructed to restrict infiltration into underlying soils.	Robson	Ongoing	Salinity Management Plan Section 5.4
Services that are to be located below the roads, footpath and hardstand surfaces will be installed at the time of construction of the road, where possible.		During construction	
Where ponds are intended to be permanently full i.e. recreational / aesthetic ponds / fountains, it is recommended that the base of the ponds / fountains be lined with an impermeable liner or other suitable methods i.e. clay liners.		As required	Salinity Management Plan Section 5.6
Fill Importation			
Only Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM) or other material approved in writing by EPA will be brought onto the site.	Robson	Ongoing	SSD 7348 Condition D79
Accurate records of the volume and type of fill used on site will be maintained and made available to the DPIE if requested.			
A Materials Tracking Register will be implemented to ensure that only “approved” ENM or VENM is imported to the Site. The Materials Tracking Register will include the requirements listed in Section 3 of the FIP (Appendix O).		Weekly	G36 Section 4.18 and FIP Section 3
Materials imported to Site will be either Excavated Natural Material (ENM) or Virgin Excavated Natural Material (VENM). Assessment requirements in Section 2 of the FIP (Appendix O) will be adhered to.		Prior to importation of fill	FIP Section 2
Inspections of vehicles importing fill to site will be undertaken. Where suspicious loads and/or evasive answers are apparent, permission to unload will not be granted.			
Where contaminants or suspected contaminants are observed in imported material during tipping, the truck will be reloaded and be sent back to the source site. Cartage from the source site shall cease and will only recommence when the Contractor is satisfied that the issue has been addressed.			

4.7 Waste

Construction waste will be managed in accordance with the Waste Management Plan (SLR 2017) (WMP) prepared to fulfil Condition D112 of Development Consent SSD 7348 (see **Appendix P**). The WMP developed for the EIS has been used in this CEMP.

All attempts will be made to minimise construction waste generation and implement reuse/recycling opportunities. All waste streams that will be generated during construction activities are listed in **Table 18** along with their waste classification and proposed management method.

Table 18 Additional Waste Streams – Construction Activities

Waste Types	NSW Classification	Proposed Reuse / Recycling / Disposal Method
Site Preparation, Excavation and Construction		
Sediment fencing, geotextile materials	General solid (non-putrescible) waste	Reuse at other sites where possible or disposal to landfill
Concrete (solids and washouts) and asphalt		Reuse at other sites where possible or disposal to landfill
Steel reinforcing, other metal (i.e. wire mesh)		Off-site recycling
Conduits and pipes		Reuse on-site or off-site recycling
Timber formwork		Off-site recycling
Metals including metal from fencing and bulk electrical cabling.		Off-site recycling or disposal
Plasterboard		Off-site recycling
Bricks		Off-site recycling
Glass		
Light bulbs	Hazardous waste	
Plant Maintenance		
Tyres	Special waste	Off-site recycling or disposal
Empty oil and other drums / tins (e.g. fuel, chemicals, paints, spill clean ups)	Hazardous waste if the containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and from which residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if the containers have been cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility. (Note: Discharge to sewer subject to Trade Waste Agreement with local Council.)
Air and oil filters and rags	General solid (non-putrescible) waste	General solid (non-putrescible) waste
Batteries	Hazardous waste	Off-site recycling
Packaging		

Waste Types	NSW Classification	Proposed Reuse / Recycling / Disposal Method
Packaging materials, including wood, plastic (i.e. stretch wrap), cardboard and metals	General solid (non-putrescible) waste	Off-site recycling
Wooden crates	General solid (non-putrescible) waste	Reused for similar projects, returned to suppliers, or off-site recycling
Work Compound and Associated Offices		
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid (non-putrescible) waste	Co-mingled recycling at off-site licensed facility
Clean paper and cardboard		Paper and cardboard recycling at off-site licensed facility
General domestic waste generated by workers (soiled paper and cardboard, food stuffs, polystyrene)	General solid (non-putrescible) waste mixed with putrescible waste	Disposal at landfill
Pump-out waste and septage (sewage)	General solid (non-putrescible) waste	Off-site disposal at licensed facility or disposal direct to sewer where arranged with Council

Table 19 lists the environmental controls that will be implemented to minimise the potential for adverse impacts as a result of waste generated during the construction of the WNSLR.

Table 19 Environmental Management Controls for Waste

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
All existing rural fencing along the water pipelines corridor adjacent the site will be removed and dispose to an appropriate waste facility licensed to accept the waste.	Robson	As required	SSD 7348 Condition D44
Waste will be secured and maintained within designated waste storage areas at all times and will not leave the site onto neighbouring public or private properties.		Ongoing	SSD 7348 Condition D111
The WMP will be implemented for the duration of construction.			SSD 7348 Condition D112
All liquid and non-liquid wastes to be taken off site will be assessed and classified in accordance with the latest version of the <i>Waste Classification Guidelines Part 1: Classifying Waste</i> (EPA 2014) and dispose of all wastes to a facility that may lawfully accept the waste.			SSD 7348 Condition D113
Waste generated outside the site will not be received for storage, treatment, processing, reprocessing, or disposal.			SSD 7348 Condition D114
The <i>Protection of the Environment Operations (Waste) Regulation 2005</i> (as amended) will be complied with for monitoring and reporting the disposal of any hazardous, industrial and/or Group A (liquid waste).			G36 Section 4.11.1

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Copies of licences or licence numbers (under the <i>Waste Avoidance and Resource Recovery Act 2001</i>) for transporters of industrial/hazardous waste, industrial / hazardous waste treatment facilities and waste disposal facilities will be obtained.	Robson	Prior to transporting / disposing of waste	G36 Section 4.11.1
A Waste Management Register will be maintained, and will include: <ul style="list-style-type: none"> Type of waste and its classification (according to the POEO Act and Waste Classification Guidelines); Quantities of waste, measured in tonnes; How and where the waste was reused, recycled, stockpiled or disposed of; Date when the waste was reused, recycled, stockpiled or disposed of; and Name and waste transport licence (if applicable) of the transporter used. 		Ongoing during construction	G36 Section 4.11.2
A Waste Avoidance and Resource Recovery Report will be submitted to Goodman containing information relating to wastes generated or recycled during the previous 12 months in accordance with Annexure G36/F.		Within one month from 1 July of the current calendar year or for the previous calendar year if commenced after 1 July, then Annually and at completion	G36 Section 4.11.3
A completed and signed notice under Section 143(3A) of the POEO Act ('s.143 Notice') will be completed and provided to Goodman.		Prior to transporting / disposing of waste	G36 Section 4.11.4
Opportunities for waste avoidance will be identified in accordance with Section 5.4 of the WMP.		Prior to commencing construction and ongoing	WMP Section 5.4
Waste audits will be undertaken and compared against projected waste generation numbers.		Quarterly	
The re-use, recycling and disposal procedures listed in Section 5.5 of the WMP will be implemented.		Ongoing	WMP Section 5.5

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Waste will be appropriately segregated for waste collection, including but not limited to: <ul style="list-style-type: none"> • Timber/wood; • Steel/scrap metal; • Bricks; • Paper/cardboard; • Concrete; and • General waste. 	Robson	Ongoing	WMP Section 5.6.1
Waste storage areas will be accessible and allow sufficient space for storage and servicing requirements.			WMP Section 5.6.2
Skips/bins will be checked by the Project Manager to ensure that no overflow occurs. If skips/bins are reaching capacity, removal and replacement will be organised for the next 24 hours.		Daily	WMP Section 5.6.3
All skips/bins leaving the site will be covered to ensure that the spillage of wastes from the skips whilst in transit is eliminated.		Ongoing	
Waste containers will be kept clean and in a good state of repair.			WMP Section 5.6.4
In the event that any contaminated or hazardous materials are unexpectedly uncovered during demolition or excavation works, the Project Manager is to stop work immediately and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.		If required	WMP Section 5.6.5
If a spillage occurs, staff will immediately identify the spilled materials, notify the Project Manager then contain the spill as soon as possible so it doesn't spread.			
Spill kits will be provided at appropriate locations and in close proximity to staff car park areas, dangerous goods storage areas and main construction area.		Ongoing	WMP Section 5.6.7
Material Safety Data Sheets (MSDS) will be located nearby spill kit areas for advice on spillage clean-up and disposal.			
Standard signage will be posted in all storage/waste collection areas and all skips/drums/bins will be labelled correctly and clearly to identify materials stored within.			WMP Section 5.7
Where applicable, general and co-mingled recycling bins placed nearby staff tearoom/break areas will be colour coded with clear labels.			
All staff will be appropriately inducted to the provisions of the WMP.		Prior to commencing works	WMP Section 5.8

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Visual inspections of waste storage areas will be undertaken.	Robson	Daily	WMP Section 5.9
Waste records are to be provided to Goodman.		Quarterly	

4.8 Biodiversity, Landscaping and Visual Amenity

In accordance with Condition D35 of SSD 7348, a Landscape Management Plan (LMP) has been prepared by Scape Design (2019) and is attached as **Appendix Q**. Additionally, a Flora and Fauna Management Plan (FFMP) has been prepared by Ecologique (2019) to satisfy Condition D88 of SSD 7348 and is attached as **Appendix R**. While a snake management measures are required to be included in the CEMP by Condition D96 of SSD 7348, these will be addressed in the Oakdale West CEMP given the proximity of the works to the adjacent school and retirement village on the western boundary of the site.

The LMP seeks to manage potential visual impacts which may affect local and regional visual receptors and ensure that the visual and landscape treatments are consistent with the ecological revegetation works described in the LMP.

The FFMP lists the procedures to be implemented during construction to reduce the potential of impacts on the flora and fauna located within the vicinity of the WNSLR construction, including clearance strategies, relocation programs, and weed and pathogen control.

Table 20 outlines the mitigation measures to be implemented during construction to management the impacts to biodiversity, landscaping and visual amenity.

Table 20 Environmental Management Controls for Biodiversity, Landscaping and Visual Amenity

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Biodiversity			
Suitable measures will be implemented to manage pests, vermin and declared noxious weeds on the Site.	Robson	Ongoing	SSD 7348 Condition D115
The Site will be inspected to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on Site in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in the surrounding area.	Robson / ER	During ER inspections	
All employees and contractors will be inducted to ensure that procedures outlined in this FFMP are met. This will have a focus on no-go zones, clearing limits and compliance with statutory requirements applicable to flora and fauna.	Robson	Prior to commencing construction and ongoing	FFMP Section 4
Pre-clearing surveys will be undertaken by an experienced ecologist. Habitat features that will be cleared are to be appropriately marked and located by GPS.		Immediately prior to clearing works	
Pre-clearance reporting (including GPS measurements and FFMP constraints mapping) will be prepared to inform the following: <ul style="list-style-type: none"> Clearing limits, no-go zones, and areas that will be protected; Habitat features within clearing limits that require two-stage felling; and Amendments required to the CEMP. 		Prior to commencing construction	

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Environmentally sensitive areas will be fenced and habitat features to be felled will be appropriately marked.	Robson	Prior to commencing construction	FFMP Section 4
Clearing of vegetation will be in accordance with G40.		Ongoing	
Clearing of vegetation and/or removal of bushrock will not go beyond the approved clearing limits for the project		Prior to commencing construction	
The pre-clearing process will completed before any clearing begins.		Ongoing	
An ecologist will be present for all felling of identified habitat features.		As required	
The fauna rescue and release protocols will be followed to ensure native fauna are not impacted during construction.		Prior to commencing construction and ongoing	
Should unexpected threatened flora or fauna be encountered on site, a stop works procedure will be followed.			
Declared priority weeds will be managed according to requirements of the <i>Biosecurity Act 2015</i> . The use of herbicides will be undertaken in accordance with the requirements of the <i>Pesticides Act 1999</i> .			
Hygiene procedures will be implemented to avoid the introduction and/or spread of soil borne pathogens.			
Landscaping			
All landscaping implemented as shown on Figure 5 in Appendix 2 of SSD 7348 will be maintained.	Robson	Ongoing	SSD 7348 Condition D38
If the monitoring carried out in accordance with the LMP indicates that any aspect of the landscaping has not been successful, re-planting and rehabilitation works will be undertaken, as soon as reasonably practicable.			
Use of pesticides will be in accordance with the <i>Pesticides Act 1999</i> (NSW), other relevant legislation, label directions and any relevant industry codes of practice.			G36 Section 4.12
A Records Sheet will be completed within 24 hours of applying the pesticide and a copy to Goodman, in accordance with Annexure G36/G of G36. Exemptions for completing a Records Sheet are outlined in Section 4.12 of G36.			
All personnel managing and using pesticides will receive appropriate training and hold appropriate licence prior to commencing work.			
Only pesticides registered for use near water will be used near water.			

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Public notification of pesticide use will be undertaken in accordance with Annexure G36/H of G36.	Robson	As required	G36 Section 4.12
When adjacent to, or across the road from, a “sensitive place” (see definition in G36), the following will be implemented: <ul style="list-style-type: none"> Mechanical means of pest control (such as mowing or slashing) where feasible; or Hand-held application of pesticides where mechanical means of pest control are not feasible. 			
Avoid applying pesticides: <ul style="list-style-type: none"> On hot days when plants are stressed; After the seed has set; Within 24 hours of rain or when rain is imminent; and When winds will cause drift of pesticides into non-target areas. 			
The method of clearing and the extent and sequencing of clearing will be undertaken in accordance with <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011).		Ongoing	G40 Section 2.1
Timber logs will be selected from the cleared trees and stocked on site.			
Timber logs will be installed at the fauna culvert entries on both sides to comprise coarse woody debris sourced from site-felled trees, as shown on the landscape drawings and RMS R178.			
Areas to be cleared outside the formation will be undertaken in accordance with Section 2.2 of G40.			G40 Section 2.2
At bridges, all trees and stumps and all built structures will be removed within the area specified in Annexure G40/A except: <ul style="list-style-type: none"> Where shown otherwise on the Drawings; or Marked to be preserved; or Within 5m of the bank of any stream or other waterway. 			G40 Section 2.3
Trees outside the area specified in Annexure G40/A that have branches overhanging the bridge will have their branches lopped to be 3m clear of the bridge.			
Trees within 10m of the centreline of the bridge and within 5m of the bank of any stream or other waterway will be cleanly cut off between 300-600mm above the adjacent ground level so that stable vegetation is retained on the banks.			

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Before clearing commences, clearing limits and sensitive areas / no go zones will be clearly delineated on site	Robson	At least 7 days prior to the commencement of clearing	G40 Section 2.4
Clearing limits will be delineated using highly visible continuous barrier or tape such as bunting, nightline or other similarly robust and durable material.		Ongoing	G40 Section 2.4
A site walk-over will be undertaken with Goodman to confirm clearing boundaries before the start of work. No clearing will be undertaken outside the agreed clearing boundaries without the prior approval.		Prior to clearing	
A clearing report will be prepared in accordance with Section 2.4 of G40.			
All staff will be made aware of the Noxious Weeds present on-site and requirements related to the listing under the <i>Biosecurity Act 2015</i> .			
Weeds will be removed and disposed of in accordance with the requirements of Council.		Ongoing	
Protective measures will be taken during the operations of clearing and road construction to avoid damaging or destroying threatened flora species and trees which have been marked or otherwise identified for preservation.			
Tree clearing and pruning will be undertaken in accordance with AS 4373.			
Every precaution will be taken to prevent timber from falling on private property and dispose of any timber so fallen or produce the written consent of the owner to its remaining there.		As required	
Existing trees, grasses and other ground cover will be retained within 15m of rivers, creeks and watercourses and in all drainage lines until immediately before construction commences in the area. All trees in these areas will be felled manually, leaving grasses and small understorey species wherever possible.			
Holes left following the removal of trees and stumps will be backfilled and vegetated as described in Section 3 of G40.			
Grubbing operations will be carried out both to a depth of 0.5m below the natural surface and 1.5m below the top of the Selected Material Zone.			G40 Section 3
Holes remaining after trees and stumps have been grubbed will be backfilled promptly with sound material to prevent the infiltration and ponding of water.			

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
The backfilling material will be compacted to at least the relative compaction of the material existing in the adjacent ground. In the area defined in Section 2.2 of G40, the final 50mm of backfilling will be topsoil and the area will be vegetated.	Robson	Within 7 days of removal of the stump	G40 Section 3
Native trees removed during clearing and grubbing will be converted to mulch and stockpiled for use during landscape planting, except for the circumstances outlined in Section 4 of G40.		Ongoing	G40 Section 4
Materials will be stockpiled in assigned locations, unless otherwise approved.			
Stockpiles will be located away from drainage lines and watercourses and will be arranged to minimise damage to natural vegetation and trees.			
Stockpiles will be positioned so that the stockpiled material may be transported away at any time.			
Restoration of stockpile sites following completion of the work will be carried out in accordance with RMS R178.			
Mulch in excess of the quantity required for landscape planting will not be stockpiled on site.			
The management and mitigation measures listed in Section 4 of the LMP will be implemented.			LMP Section 4
Visual Amenity			
Lighting will comply with the latest version of AS 4282.	Robson	Prior to commencing construction and ongoing	SSD 7348 Condition D40
Lighting will be mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.			SSD 7348 Condition D41
Any security cameras will be directed away from adjacent private properties.	Goodman / Robson		SSD 7348 Condition D43
All signage and fencing will be erected in accordance with the plans in the RTS.	Robson	Ongoing	SSD 7348 Condition D45
Existing rural fencing will be removed along the water pipelines corridor adjacent the site and disposed to an appropriate waste facility licensed to accept the waste.			
Temporary security fencing along the water pipelines corridor adjacent the site will be installed and maintained for the duration of construction, or until a permanent fence is installed.			
Permanent 2.4 metre high fencing will be installed and maintained along the water pipelines corridor adjacent the site, including the approaches to the WNSLR bridge over the water pipelines corridor and above retaining walls, unless otherwise agreed with Water NSW.			

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Concrete barriers or barrier guard rails (including barriers leading up to bridge structure) will be installed to the WNSLR where there is potential for large vehicles to drive over retaining walls and into the water pipelines corridor. Barriers will be rated to withstand impact from B-Double size vehicles.	Robson	Ongoing	SSD 7348 Condition D45
Cranked throw screens on both sides of the WNSLR bridge crossing the Water NSW water pipeline corridor will be installed.			

4.9 Heritage

As required by Condition D106 of SSD 7348, an Unexpected Finds Protocol – Archaeological Items (UFP – Archaeological Items) has been prepared by Artefact (2019) and is attached as **Appendix S**.

If unanticipated archaeological items are uncovered at any time throughout the construction of the WNSLR the Protocol outlined in the UFP – Archaeological Items will be followed. This Protocol includes:

- Cease all activity in the vicinity of the find;
- Leave the material in place and protect it from harm;
- Erect a 10m exclusion zone (temporary fencing/signage); and
- Take note of the details of the material and its location, and take a photograph of the find in situ.

The Contractor's Project Manager will:

- Notify the Biodiversity Conservation Division (BCD) of DPIE on the Environment Line – 131 555;
- Notify the ER;
- Call the archaeologist to identify whether additional investigation is required in accordance with the conditions of approval and BCD guidelines. The Artefact archaeologist can be contacted on 02 9518 8411 and/or office@artefact.net.au;
- Notify BCD if confirmed as an Aboriginal object or relic; and
- Await further advice before proceeding with work in the area.

In addition to the above, the mitigation measures outlined in **Table 21** will be implemented during the construction of the WNSLR.

Table 21 Environmental Management Controls for Heritage

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Any identified Aboriginal items or objects will be registered on the OEH's Aboriginal Heritage Information Management System (AHIMS) Aboriginal Sites Register.	Goodman	Prior to commencing construction	SSD 7348 Condition D103
An Archaeological Test Excavation will be undertaken in accordance with Condition D104 of SSD 7348.			SSD 7348 Condition D104
Construction of Stage 1 will not commence until the Archaeological Test Excavation has been undertaken and provided to the appropriate regulators.			SSD 7348 Condition D105
If any item or object of Aboriginal heritage significance is identified on Site the unexpected finds protocol will be implemented in accordance with the UFP – Archaeological Items and Condition D106 of SSD 7348.		As required	SSD 7348 Condition D106
Work in the immediate vicinity of the Aboriginal item or object will only recommence in accordance with the provisions of Part 6 of the <i>National Parks and Wildlife Act 1974</i> (NSW).			SSD 7348 Condition D107

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
If any archaeological relics are uncovered during construction of Stage 1, then all works in the immediate vicinity of the relic will cease immediately. Unexpected finds will then be evaluated and recorded in accordance the requirements of Department of Premier and Cabinet, Heritage (former NSW OEH Heritage Division).	Robson	As required	SSD 7348 Condition D108

4.10 Hazardous Goods and Contamination

As required by Condition D116 of SSD 7348 an Unexpected Contamination Protocol (UCP) has been prepared by AECOM (2019b) and is attached as **Appendix T**.

The environmental controls that will be implemented to minimise the potential for environmental incidents relating to the hazardous goods and contamination are presented in **Table 22**

Table 22 Environmental Management Controls for Dangerous Goods

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The quantities of dangerous goods stored and handled at the Site will be below the threshold quantities listed in <i>Hazardous and Offensive Development Application Guidelines - Applying SEPP 33</i> at all times.	Robson	Ongoing	SSD 7348 Condition D109
Chemicals, fuels and oils will be stored in bunded areas in accordance with relevant Australian Standards and/or the <i>Storing and Handling of Liquids: Environmental Protection – Participants Manual</i> (Department of Environment and Climate Change 2007).			SSD 7348 Condition D110 and G36 Section 4.3
An Unexpected Contamination Protocol (UCP) (AECOM 2019b) has been prepared to ensure that potentially contaminated material is appropriately managed.		Prior to commencing construction	SSD 7348 Condition D116
Any material identified as contaminated will be disposed offsite, with the disposal location and results of testing submitted to the Planning Secretary, prior to its removal from the site.	Robson / ER	As required	
The Contractor's Project Manager and the ER will be notified of any suspected or potential contamination exposed during construction activities, and cease all work activities within the vicinity of actual or suspected contaminated land.	Robson	Immediately	G36 Section 4.2
Where the contamination is known or an unexpected contamination find has been identified, a Remediation Action Plan (RAP) will be prepared (as required) in accordance with G36 and the UCP (AECOM 2019b).		As required	G36 Section 4.2 and UCP Section 3.1
Following any remediation work, a validation report will be prepared confirming that all requirements of the RAP have been met, including documentary evidence confirming off-site disposal of contaminated soils.		Following any remediation works	G36 Section 4.2
Relevant control measures will be implemented to divert any surface runoff away from the contaminated land, and capture and treat any surface runoff contaminated by exposure to the contaminated land.		As required	
Hazardous material storage areas will not be located within 50 m of any aquatic habitat, any areas of concentrated water flow, flood prone or poorly drained areas, or on slopes steeper than 1:10.		Ongoing	G36 Section 4.3

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Robson will not refuel or maintain plant and equipment, mix cutting oil with bitumen, or carry out any other activity which may result in spillage of a chemical, fuel, liquid, hazardous material or lubricant, within 50 m of any areas of concentrated water flow, flood areas, slopes above 10% and at any location which drains directly to waters or environmentally sensitive areas, without the appropriate temporary bunding being provided. Refuelling operations will not be left unattended.	Robson	Ongoing	G36 Section 4.3 and SWMP Section 6
Adequate quantities of suitable material will be kept on site to counteract spillage readily available i.e. Emergency spill kits.		Prior to commencing construction and ongoing	
Emergency spill kits will be kept on site at all points of transfer for fuels and hydrocarbons, and at all other locations deemed necessary.			
In the event that unexpected contamination finds are encountered: <ul style="list-style-type: none"> Robson will immediately inform the Project Manager and AECOM. The Superintendent will inform Goodman. AECOM will inspect the unexpected find (if required). 	Robson / Project Manager / AECOM	As required	UCP Section 3.1
In the event that fragments of Asbestos Containing Materials (ACM) are identified during the earthworks, works will cease and the procedure outlined in Section 3.2 of the UCP will be implemented.			UCP Section 3.2
In the event that burial pits relating to the former grazing activities are exposed, works will cease in that area and the procedure outlined in Section 3.3 of the UCP will be implemented.			UCP Section 3.3
In the event that other contaminated materials are identified during the earthworks, works will cease and the procedure outlined in Section 3.4 of the UCP will be implemented.			UCP Section 3.4
A Materials Tracking Plan (MTP) will be developed and implemented in accordance with Section 4 of the UCP.	Robson	Ongoing	UCP Section 4
AECOM will prepare a Validation Report in accordance with the requirements of the NSW OEH (2011) <i>Guidelines for Consultants Reporting on Contaminated Sites</i> and EPA (2017) <i>Guidelines for the NSW Site Auditor Scheme (3rd Edition)</i> .	Robson / AECOM	At the completion of the earthworks and if any unexpected finds were encountered that required remediation	UCP Section 5

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Safety Data Sheets (SDS) will be kept in the Site office and/or safety system for any potentially hazardous goods stored and/or used on site.	Robson	Ongoing	Best practice
The actions specified on the respective SDS will be implemented in the event of a minor chemical or fuel spill.			
Appropriate signage and spill kits will be maintained at key locations according to the construction schedule.			
All employees and contractors required to used potentially dangerous goods will be appropriate trained in the proper storage , use and handling.			
Any liquid wastes or dangerous goods wastes generated by the construction activities (e.g. due to damage or leakage of containment) will be disposed of by a suitably qualified contractor to an appropriately licensed disposal facility.			

4.11 Fire Safety and Emergency

As part of the development application for Oakdale West, Australian Bushfire Protection Planners Pty Ltd (ABPP) prepared a Bushfire Protection Assessment (2016) to outline the bushfire protection measures required for the development.

A copy of the Bushfire Protection Assessment (ABPP 2016) is attached as **Appendix U**.

The environmental controls that will be implemented to minimise the potential for environmental incidents relating to fire are presented in **Table 23**.

Table 23 Environmental Management Controls for Fire

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
The construction will comply with the relevant provisions of <i>Planning for Bushfire Protection</i> (NSW Rural Fire Service 2006).	Robson	Ongoing	SSD 7348 Condition B20 and D97
The WNSLR will be constructed in accordance with the Bushfire Protection Assessment (ABPP 2016).			
The WNSLR will comply with the requirements of AS 2419.1 -2005 Fire Hydrant Installations for fire-fighting water supply.			
In the event of emergency, the contact details in Table 7 will be contacted.		In the event of an emergency	Section 3.5.3
All items of plant used during proclaimed high fire danger periods that could discharge sparks will be fitted with spark arresters.		As required	G36 Section 4.5
Cutting, welding, grinding or other activities likely to generate fires will not be undertaken in the open on days when a total fire ban is proclaimed, unless an exemption is granted by the relevant Fire Service.		Ongoing	
When there is a risk of fire being caused by work such as welding, thermal or oxygen cutting, heating or other fire producing or spark producing operations or when burning off is proposed, training will be provided to all personnel in fire prevention, fire safety and basic firefighting skills.		Prior to commencing construction and ongoing	
Appropriate firefighting equipment will be provided as required for the safety of persons and property.			
Areas under shrubs and trees will be raked and clear of combustible fuels.		Ongoing	Bushfire Protection Assessment Section 6.1
Non-flammable materials such as Scoria, pebbles and recycled crushed bricks will be used as ground cover to landscaped gardens in close proximity to buildings.			

Environmental Management Control	Person Responsible	Timing / Frequency	Reference / Notes
Trees and shrubs will be maintained in such a manner that tree canopies are separated by 2 m and understorey vegetation is not continuous.	Robson	Ongoing	Bushfire Protection Assessment Section 6.1
Emergency vehicle access to and from the Site will be available at all times during construction.			Best practice
Fire extinguishers will be located at work locations where hot work is being undertaken or flammable gases are stored.			
Construction plant will be fitted with fire extinguishers, as required/appropriate.			
Waste material will not be burnt on site and no fires of any kind will be lit on site.			

4.12 Community

In accordance with Condition C19 of SSD 7348, a CCS has been prepared by SLR (2019b) and is attached as **Appendix I**.

The CCS identifies relevant stakeholders, key issues, communication methods and the details of how Goodman and their contractors will engage with relevant stakeholders and the community. Any CEMP prepared for works that are part of a Future Development Application will be prepared in consultation with the relevant Government agencies, infrastructure and utility provided, including but not limited to, TransGrid, Endeavour Energy, Water NSW and TfNSW, where relevant for each stage in accordance with C18(b) SSD 7348.

The community management controls in **Table 24** will be implemented during the construction of the WNSLR.

Table 24 Environmental Management Controls for the Community

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Sensitive receptors will be consulted prior to actions likely to generate noise, vibration, air quality of traffic impacts.	Communications and Community Liaison Representative	No less than 48 hours prior	CCS Section 3.2
Should any works be likely to generate impacts beyond those identified within the approval's documentation, consultation will be undertaken with the applicable managing agency.		As required	
A Communications and Community Liaison Representative will be appointed as a single point of contact responsible for receiving and disseminating information requests and complaints, along with addressing any interface issues		Prior to commencing construction and ongoing	CCS Section 4
Community consultation meetings will be held to provide a project update and act as an opportunity for the community and stakeholders to discuss recent experiences and upcoming construction activities.	Community Consultation Team	Monthly. Frequency to be revised subject to the level of interest and the construction program	CCS Section 5.3
Community workshops will be held to identify the overarching construction program and communications protocols, with the event advertised via local newspaper and letter box drop.		Prior to commencing construction	
A Consultation Register will be maintained and record community and stakeholder interactions, along with associated remedial actions as required.	Communications and Community Liaison Representative	Ongoing	
ERG Meetings will be held with key environmental stakeholders and will be briefed on upcoming project tasks with key environmental implications, along with complaints and enquiries received.	ER	As required	

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Individual Community Meetings will be held with stakeholders as required to discuss a specific item.	Community Consultation Team		
Newspaper Advertisements will be published in The Western Weekender and Mt Druitt – St Marys Standard identifying the project hotline number and web page address.	Community Consultation Team	Prior to commencing construction and ongoing	CCS Section 5.3
Notification Letterbox Drop will be provided to specific receivers identified as being potentially affected by construction. This could be undertaken in tandem with door knocking.		As required in accordance with Table 7 of the CCS	
Site Signage will display project information details including the hotline and web page, along with relevant project and safety information.		Prior to commencing construction and ongoing	
Online Feedback Forms will be available on the web page, with feedback provided to be incorporated into the consultation register and actioned as required.			
A 24 hour Project Information and Complaints Number will be available for reporting project feedback.			
Staff and Visitor Induction and Training will be undertaken in accordance with Section 3.4 .	Robson		
Text Message and Email Alerts will provide important information at short notice to potentially affected receivers. Text message details to be recorded in the consultation register.	Community Consultation Team	As required	
A dedicated web page will be established to provide project updates, along with real time environmental performance monitoring.		Prior to commencing construction and ongoing	
Notification requirements will be undertaken in accordance with Table 6, 7 and 8 of the CCS.		Ongoing	

5 Monitoring and Reporting

5.1 Environmental Monitoring and Inspections

Table 25 summarises the monitoring requirements for the construction of the WNSLR as set out in SSD 7348 and relevant management plans.

Table 25 Monitoring and Inspection Requirements

Monitoring / Inspection Requirement	Person Responsible	Timing / Frequency	References / Notes
General			
Inspection and maintenance of all plant and equipment items to ensure optimal operating condition.	Robson	As specified by the manufacturer / supplier	SSD 7348 Condition D21
The ER will regularly monitor the implementation of the CEMP, and any other documents identified by the Planning Secretary, to ensure implementation is being carried out in accordance with the CEMP and SSD 7348.	ER	Weekly	SSD 7348 Condition D127
Compliance monitoring and reporting will be undertaken in accordance with the Compliance Monitoring and Reporting Program (SLR 2019c).		Ongoing	SSD 7348 Condition D139
All monitoring will be undertaken in accordance with Division 9.4 of Part 9 of the EP&A Act.	ER / Robson		SSD 7348 Condition D142
General environmental site inspection to ensure all relevant environmental controls listed in this CEMP are in place and any required maintenance and/or remediation works are identified and undertaken.	Robson	Weekly	G36 Section 3.3
Noise and Vibration			
Attended and/or real-time noise and/or vibration monitoring will be undertaken at the start of any new noise or vibration intensive works which are close to potentially affected receivers to verify the levels are as predicted and to check the effectiveness of mitigation and management measures used to minimise the impacts. This includes where works are adjacent to the office of the Viridian site in Erskine Business Park and where works are adjacent to the nearest residences in Kemps Creek.	Robson	As required	CNVMP Section 8.1
Monitoring will also be undertaken in response to any complaints regarding noise or vibration.		Following a noise or vibration related complaint	

Monitoring / Inspection Requirement	Person Responsible	Timing / Frequency	References / Notes
Vibration will be monitored continuously within the minimum working distances (see Table 12) where vibration intensive works are proposed to be undertaken within the minimum working distances of sensitive receivers or structures.	Robson	Continuously	CNVMP Section 8.2
Attended vibration measurements will be undertaken at the commencement of vibration intensive works within the minimum working distances to confirm the levels of vibration are below the applicable vibration limits.		Prior to commencing vibration intensive works	
Geophones will be installed by an acoustic consultant on top of each pipeline at the centre point between two saddles closest to the works.		Prior to commencing construction and ongoing	
Baseline vibration measurements will be recorded for at least one week to determine background levels of vibration at the site prior to commencement of any works.		For 1 week prior to commencing any works on site	
The monitoring equipment will have visible and audible alarms in accordance with Section 8.2 of the CNVMP.		Ongoing	
Air Quality			
Visual inspections will be undertaken to: <ul style="list-style-type: none">Identify if any dust clouds can be seen leaving site etc.Stockpiles or waste storage to ensure no wind erosion Where excessive dust events occur (i.e. prolonged visual dust in a particular area) watering of dusty activities is to be undertaken or activities temporarily halted and then resumed once weather conditions have improved. Record inspection results and make an inspection log available to the local authority when asked.	Robson	Daily	CAQMP Section 9
Meteorological data recorded at Horsley Park AWS will be monitored and reviewed on a daily basis.		Daily	
Nuisance depositional dust monitoring will be undertaken in accordance with AS/NZS 3580.1.1.		Monthly	
Traffic			
Deliveries volumes will be monitored against the volumes outlined within report.	Robson	Ongoing	CTMP Section 6.1
Soil and Water			
Any material transported onto road surfaces to be removed.	Robson	Daily and before rainfall	G38 Section 3.1

Monitoring / Inspection Requirement	Person Responsible	Timing / Frequency	References / Notes
Sediment basins will be cleaned. Sediment will be disposed of so that it will not be conveyed back into the construction areas, into watercourses or off site.	Robson	When sediment exceeds 60% of the sediment storage zone	G38 Section 3.2.4
Erosion and sediment controls will be checked and maintained on a regular basis and after a rain event of ≥10mm (including clearing of sediment from behind controls). Rectify any defects.		Weekly, before extended shut down or within 3 hours (during work hours) or 24 hours (outside of work hours) following ≥10mm rain or prolonged rainfall	G38 Section 4 and SWMP Section 6
A Soil Conservationist (CPESC) will undertake periodic site inspections of the ESCP implementation across the site and prepare a report.		Periodically	
pH will be tested at any basin using a probe to ensure it remains below the criteria.		Daily during any discharge	G38 Section 3.3.4 and SWMP Section 6
Turbidity will be tested at any basin using a probe or grab sample to ensure it remains below the criteria.			
Total Suspended Solids (TSS) will be tested at any basin using a grab sample to ensure it remains below the criteria. Once a correlation with turbidity is completed the requirement for TSS verification is reduced to a frequency of 1 in 10 discharges to positively prove the correlation is still applicable.		Daily during any discharge then 1 in 10 discharges	
Oil and Grease will be monitored at any basin using a visual inspection to ensure there is no oil or grease visible.		Daily during any discharge	
Inspections of vehicles importing fill to site will be undertaken. Where suspicious loads and/or evasive answers are apparent, permission to unload will not be granted.		During importation of fill	FIP Section 2
Waste			
Skips/bins are to be checked by the Project Manager to ensure that no overflow occurs. If skips/bins are reaching capacity, removal and replacement will be organised for the next 24 hours.	Robson	Daily	WMP Section 5.6.3
Visual inspections of waste storage areas will be undertaken.			WMP Section 5.9
Ecology, Landscaping and Visual Amenity			
The monitoring program outlined in Sections 6.1 - 6.4 of the LMP will be implemented.	Robson	As stated in LMP	LMP Sections 6.1 - 6.4

Monitoring / Inspection Requirement	Person Responsible	Timing / Frequency	References / Notes
Community			
<p>The following will be monitored:</p> <ul style="list-style-type: none"> • Total number of complaints • Number of complaints relating to lack of consultation / misinformation / confusion • Number of enquiries relating to information previously disseminated • Number of complaints / enquiries within defined categories based on theme or subject • Response timeframes 	Communications and Community Liaison Representative	Monthly	CCS Section 6.1

5.2 Reporting

Table 26 summarises the reporting requirements for the construction of the WNSLR as set out in SSD 7348 and relevant management plans.

Table 26 Reporting Requirements

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
General Environmental Performance			
The ER will prepare and submit an Environmental Representative Monthly Report.	ER	To be submitted within 7 days following the end of each month	SSD 7348 Condition D127
Compliance monitoring and reporting will be undertaken in accordance with the Compliance Monitoring and Reporting Program (SLR 2019c).	Goodman	Ongoing	SSD 7348 Condition D139
Compliance Reports of the Development will be carried out in accordance with the <i>Compliance Reporting Post Approval Requirements</i> (DPE 2018).		As set out in the DPE guidelines	SSD 7348 Condition D140
Each Compliance Report will be made publicly available.		No later than 60 days after submitting it to the DPIE and notify the DPIE in writing at least 7 days before this is done.	SSD 7348 Condition D141
Regular reporting on environmental performance will be uploaded on the dedicated website as per the reporting arrangements in any plans or programs approved under the conditions of SSD 7348.		48 hours prior to commencing construction and ongoing	SSD 7348 Condition D143
A copy of all environmental records will be maintained, including: <ul style="list-style-type: none"> • Site environmental inspection reports • Environmental monitoring data • Internal and external audit reports • Reports of environmental incidents, environmental, associated actions taken, and follow-up actions • Minutes of management review meetings • Induction and training records 	Robson	For at least 5 years after completion	G36 Section 3.11

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Robson will report environmental performance during regular management meetings and/or 'toolbox talks'. Items to be discussed include: <ul style="list-style-type: none">Results of any monitoring activities undertakenAny environmental incidents that have occurred during the previous period, including the management / corrective actions takenAny complaints that have been received during the previous period, including any management / corrective actions taken	Robson	Weekly	Section 3.4
Meteorological data including rainfall will be recorded.		Daily at the same time	G38 Section 4
Incident / Non-Compliance Reporting			
A written incident notification will be emailed to the DPIE at compliance@planning.nsw.gov.au and include the requirements outlined in Appendix 8 of SSD 7348.	Goodman / Robson	Within 7 days after Goodman becomes aware of the incident	SSD 7348 Condition D135and Appendix 8
A detailed incident report will be provided to the Planning Secretary and include the requirements outlined in Appendix 8 of SSD 7348.		Within 30 days of the incident occurring	
The DPIE will be notified of any non-compliance in writing to compliance@planning.nsw.gov.au .		Within 7 days after Goodman becomes aware of the non-compliance	SSD 7348 Condition D136
A register of all complaints and non-compliances will be kept.		For at least 5 years after completion	Best practice
Noise			
Monitoring reports will be produced following each monitoring survey.	Robson	Following each monitoring survey	CNVMP Section 8.1
Vibration			
Vibration monitoring reports will be prepared at the following stages: <ul style="list-style-type: none">Prior to commencement of works (baseline report)Monthly during works (at a minimum)Within one week of an exceedance of the vibration limit alarm level (15 mm/s PPV)Upon completion of construction	Robson	Monthly at minimum	CNVMP Section 8.2
Traffic			
Heavy vehicle breaches during school zones will be captured and reported to DPIE at monthly intervals.	Robson	Monthly	CTMP Section 3.1.5

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Soil and Water			
The ER will make a written statement to the Planning Secretary confirming the erosion and sediment controls are implemented and operational.	ER	Prior to commencing bulk earthworks	SSD 7348 Condition D81
Prepare and submit a Materials Tracking Register in accordance with the FIP.	Robson	Weekly	G36 Section 4.18 and FIP Section 3
A sediment basin management register will be maintained for each sediment basin that records; <ul style="list-style-type: none"> Personnel approving the dewatering activities Time and date Water quality test results and estimated volumes for each discharge 	Robson	Ongoing	G38 Section 3.4 and SWMP Section 6
If any stockpile site is to be located on private land, an approved notice under s.143 of the POEO Act will be obtained from the landholder prior to commencement of stockpiling.	Goodman / Robson	Prior to stockpiling	G38 Section 3.5
A monitoring program for the Retained Soil Wall (RTS) sacrificial steel straps will be prepared by Robson and provided to the appropriate Roads Authority and Water NSW. Additional information may also be required to be submitted to Water NSW during design/construction.	Robson	At the completion of the WNSLR	Water NSW request
Waste			
A Waste Management Register will be maintained, and will include: <ul style="list-style-type: none"> Type of waste and its classification (according to the POEO Act and Waste Classification Guidelines) Quantities of waste, measured in tonnes How and where the waste was reused, recycled, stockpiled or disposed of Date when the waste was reused, recycled, stockpiled or disposed of (separate to contaminated waste) Name and waste transport licence (if applicable) of the transporter used 	Robson	Ongoing	G36 Section 4.11.2

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
A Waste Avoidance and Resource Recovery Report will be submitted to Goodman containing information relating to wastes generated or recycled during the previous 12 months in accordance with Annexure G36/F.	Robson	Within one month from 1 July of the current calendar year or for the previous calendar year if commenced after 1 July, then Annually and at completion	G36 Section 4.11.3
A completed and signed notice under Section 143(3A) of the POEO Act ('s.143 Notice') will be completed and provided to Goodman.		Prior to transporting / disposing of waste	G36 Section 4.11.4
Waste records are to be provided to Goodman.		Quarterly	WMP Section 5.9
Biodiversity, Landscaping and Visual Amenity			
The Planning Ministerial Corporation will be notified to enable the Planning Ministerial Corporation to arrange ongoing maintenance.	Goodman	At least 1month prior to the completion of planting	SSD 7348 Condition D95
A Landscaping Logbook will be maintained.	Goodman / Robson	Monthly / Annually	LMP Section 6.1
The survey reports and records listed in the FFMP will be maintained.	Robson	Ongoing	FFMP Section 6.2
Hazardous Goods and Contamination			
Any material identified as contaminated will be disposed offsite, with the disposal location and results of testing submitted to the Planning Secretary, prior to its removal from the site.	Robson / ER	As required	SSD 7348 Condition D116
Where the contamination is known or an unexpected contamination find has been identified, a Remediation Action Plan (RAP) will be prepared (as required) in accordance with G36 and the UCP (AECOM 2019b).	Robson		G36 Section 4.2 and UCP Section 3.1
AECOM will prepare a Validation Report in accordance with the requirements of the NSW OEH (2011) <i>Guidelines for Consultants Reporting on Contaminated Sites</i> and EPA (2017) <i>Guidelines for the NSW Site Auditor Scheme (3rd Edition)</i> .	Robson / AECOM	At the completion of the earthworks and if any unexpected finds were encountered that required remediation	UCP Section 5

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
Community			
<p>The monthly community consultation summary will be made publicly available on the project web page and shall include:</p> <ul style="list-style-type: none"> • A summary of community consultation activities undertaken within the preceding month • A summary of community consultation activities proposed within the following month • A summary of all enquiries and complaints received within the preceding month, including details of response and/or remediation activities 	Communications and Community Liaison Representative	Monthly	CCS Section 6.2

5.3 Audits

Table 27 summarises the Audit requirements for the construction of the WNSLR as set out in SSD 7348 and relevant management plans.

Table 27 Audit Requirements

Reporting Requirement	Person Responsible	Timing / Frequency	References / Notes
The Planning Secretary may at any time commission an audit of an ER's exercise of its functions under Condition D142.	ER	As required	SSD 7348 Condition D129
All audits will be undertaken in accordance with Division 9.4 of Part 9 of the EP&A Act.	ER / Robson	Ongoing	SSD 7348 Condition D142
A risk-based auditing program will be prepared and implemented. The audit report will then be provided to Goodman.		Prior to commencing construction and ongoing. The report will be provided within 10 working days of the audit.	G36 Section 3.9
A project audit will be undertaken to ensure all aspects of the project are implemented.	ER	Within 6 months of the commencement of construction	ER recommendation

5.4 Contingency Management Plan

Table 28 lists the actions to be implemented if inspections, monitoring and/or auditing indicate that the mitigation measures listed in **Section 4** and the specialist management plans are not effective in managing environmental impacts.

All Condition Amber and Condition Red occurrences will be recorded in the Environmental Representative Monthly Report and discussed during the toolbox talks.

Table 28 Contingency Plan

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Noise impacts at sensitive receiver locations	Trigger	Noise levels do not exceed applicable NMLs.	Noise levels exceed applicable NMLs.	Noise levels exceed Highly Noise Affected criteria (75 dBA).
	Response	Ongoing best practice management measures to minimise noise emissions.	Undertake all feasible and reasonable mitigation and management measures to minimise noise impacts.	Undertake all feasible and reasonable mitigation and management measures to ensure noise levels are below Highly Noise Affected criteria. If noise levels cannot be kept below applicable limits then a different construction method or equipment will be utilised.
Vibration impacts at sensitive receiver locations	Trigger	Vibration intensive works undertaken outside minimum working distance for the specific equipment in use.	Vibration intensive works undertaken within minimum working distance for the specific equipment in use.	Vibration levels exceed applicable vibration limits.
	Response	Ongoing best practice management measures to minimise vibration emissions.	Undertake vibration monitoring for the duration of the works to confirm vibration levels.	Stop work. Undertake all feasible and reasonable mitigation and management measures to ensure vibration levels are below applicable limits. If vibration levels cannot be kept below applicable limits then a different construction method or equipment will be utilised.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Vibration impacts on Water NSW pipelines	Trigger	Monitored vibration levels on pipeline are <10 mm/s PPV.	Monitored vibration levels on pipeline are 10 mm/s to 15 mm/s PPV.	Monitored vibration levels on pipeline exceed 15 mm/s PPV.
	Response	Ongoing best practice management measures to minimise vibration emissions.	Care will be taken to minimise vibration levels and ensure that vibration levels do not exceed 15 mm/s PPV.	Stop work. Undertake all feasible and reasonable mitigation and management measures to ensure vibration levels are below 15 mm/s PPV. If vibration levels cannot be kept below 15 mm/s PPV then a different construction method or equipment will be utilised.
Visible dust leaving the site	Trigger	Daily inspections show that there is no visible dust leaving the site.	Daily inspections show that there is visible dust leaving the site.	Daily inspections show that there is visible dust leaving the site multiple times during a day OR from multiple locations within the site.
	Response	Continue monitoring program as normal.	Review and investigate construction activities and respective control measures, where appropriate. Implement additional remedial measures, such as: <ul style="list-style-type: none"> • Deployment of additional water sprays, water trucks etc • Relocation or modification of dust-generating sources 	Construction activities will be temporary halted and only resumed when conditions have improved

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Dust deposition reading of >4g/m ² /month	Trigger	Dust deposition rates are less than 4 g/m ² /month at all the dust gauges.	Dust deposition rate greater than 4 g/m ² /month is recorded by any of the dust gauges	Dust deposition rates greater than 4 g/m ² /month are recorded by two or more dust gauges for two months in a row.
	Response	Continue monitoring program as normal.	<ul style="list-style-type: none"> Review and investigate construction activities and respective control measures. If it is concluded that construction activities were directly responsible for the exceedance (ie the exceedance event was not caused due to high regional dust levels or local non-project dust source), submit an incident report to government agencies. Increase dust suppression measures (additional watering, covering stockpiles etc) to avoid such occurrence in future. 	Implement real-time monitoring of dust levels using a continuous monitor (eg Dustrack or eBAM), to assist with real time management of construction dust. Update this CAQMP accordingly to include these additional monitoring requirements.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Complaints received regarding nuisance dust	Trigger	There are no complaints received during the construction	An air-quality related complaint is received from a nearby resident	Further complaints are received after the additional mitigation measures have been implemented
	Response	Continue monitoring program as normal.	<ul style="list-style-type: none"> Report the complaint to the regulator, in line with complaints handling procedure. Review and investigate construction activities and increase dust suppression measures (additional watering, covering stockpiles etc.), where appropriate. 	<ul style="list-style-type: none"> Implement real-time monitoring of dust levels using a continuous monitor (e.g. Dustrack or eBAM), to assist with real time management of construction dust. Update this CAQMP accordingly to include these additional monitoring requirements. The location of the real-time dust monitor will be determined by the complainant location.
Visual Dust	Trigger	No visible dust offsite.	Evidence of dust on site. No evidence of dust off site.	Evidence of dust leaving site.
	Response	Continue CEMP implementation.	<p>Review and investigate construction activities and respective control measures, where appropriate. Implement additional remedial measures, such as:</p> <ul style="list-style-type: none"> Deployment of additional water sprays Relocation or modification of dust-generating sources 	<p>Review and investigate construction activities and respective control measures, where appropriate. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies.</p> <p>Implement relevant responses and undertake immediate review to avoid such occurrence in future.</p>

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Dirt / Mud on Public Road Network	Trigger	No dirt/mud tracked on to the public road network.	Evidence of dirt/mud at entry but none tracked on to public roads.	Evidence of dirt/mud tracked on to the public road network.
	Response	Continue CEMP implementation.	Check condition of wheel wash / cattle grids to ensure they are functioning correctly.	Check condition of wheel wash / cattle grids to ensure they are functioning correctly. Stop work and clean dirt / mud off public road network i.e. engage street sweeper etc.
Construction movements	Trigger	Construction traffic does not exceed the permissible volume and time constraints.	Construction traffic just exceeds the permissible volume and time constraints.	Construction traffic far exceeds the permissible volume and time constraints.
	Response	No response required. Continue monitoring program.	Review and investigate construction activities, and where appropriate, implement additional remediation measures such as: <ul style="list-style-type: none"> • Temporary halting of activities and resuming when conditions have improved • Review CTMP and update where necessary • Provide additional training 	Review and investigate construction activities. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies. Where appropriate, implement additional remediation measures such as: <ul style="list-style-type: none"> • Temporary halting of activities and resuming when conditions have improved • Stop all transportation into and out of the site • Review CTMP and update where necessary • Provide additional training

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Queuing	Trigger	No queuing identified.	Queuing identified within site.	Queuing identified on the public road.
	Response	No response required. 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 .	Review and investigate construction activities. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies. Where appropriate, implement additional remediation measures such as: <ul style="list-style-type: none"> • Temporary halting of activities and resuming when conditions have improved • Stop all transportation into and out of the site. • Review CTMP and update where necessary. • Provide additional training
Traffic noise	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 Continue monitoring program.	Undertake all feasible and reasonable mitigation and management measures to minimise noise impacts.	Undertake all feasible and reasonable mitigation and management measures to ensure noise levels are below Highly Noise Affected criteria. If noise levels cannot be kept below applicable limits, then a different construction method or equipment must be utilised.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Traffic Control Plans	Trigger	No observable issues	Minor inconsistencies with TCP to onsite operations	Near miss or incident occurring regardless of / as a result of the TCP being implemented
	Response	No response required Continue monitoring TCPs.	Traffic Controller to amend TCP 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 TCP to ensure that the safety of all workers, students and civilians are catered for.
Traffic Air Quality Impacts	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 Continue monitoring program	<p>Review and investigate construction activities and respective control measures, where appropriate. Implement additional remedial measures, such as:</p> <ul style="list-style-type: none"> • Deployment of additional water sprays • Relocation or modification of dust-generating sources • Check condition of vibrating grids to ensure they are functioning correctly • Temporary halting of activities and resuming when conditions have improved 	Review and investigate construction activities and respective control measures. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies. Implement relevant responses and undertake immediate review to avoid such occurrence in future.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Erosion	Trigger	No evidence of erosion.	Minor gully or tunnel erosions present and/or rilling. Evidence of sediment or sediment laden water leaving the site.	Significant gully or tunnel erosions present and/or rilling. Evidence of sediment or sediment laden water leaving the site.
	Response	Continue CEMP implementation.	A suitably trained person to inspect the site. Review of erosions and sediment structures. Remediate as appropriate.	A suitably trained person to inspect the site. Review of erosion and sediment structures. Remediate as soon as practical.
Water management structures	Trigger	Water management structures have been designed, constructed and managed in accordance with the Blue Book and the SWMP.	Inspections indicate that water management structures illustrate minor non-compliance with the Blue Book and the SWMP.	Inspections indicate a failure of the water management structures.
	Response	Continue CEMP implementation.	A suitably trained person to inspect the site. Review of water management structures. Remediate as appropriate.	A suitably trained person to inspect the site. Remediate as soon as practical. Review of engineering design and revise SWMP.
Water quality and discharge	Trigger	No water discharge. Discharge has occurred however rainfall is above designed criteria of sediment dams. Water quality within the parameters listed in G36.	Discharge has occurred, with rainfall below the design criteria. Water quality exceeds the parameters listed in G36. However, no material harm to the environment.	Discharge has occurred, with rainfall below the design criteria. Water quality exceeds the parameters listed in G36. Evidence of material harm to the environment.
	Response	Continue CEMP implementation.	Implement incident response procedure as per the CEMP (see Section 3.5.6). Additional water sampling required.	Implement incident response procedure as per the CEMP (see Section 3.5). Additional water sampling required.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Waste	Trigger	Weekly ER inspections identified no waste outside of dedicated bins and stockpiles.	Weekly ER inspections identified minimal waste outside of dedicated bins and stockpiles.	Weekly ER inspections identified large quantities of waste outside of dedicated bins and stockpiles. Complaints received regarding waste.
	Response	Continue CEMP implementation.	The Project Manager is notified and the waste is cleaned up immediately.	The Project Manager is notified and the waste is cleaned up immediately. The Communications and Community Liaison Representative is also notified and the complaints handling process outlined in Section 3.6 and the CCS is implemented.
Native vegetation clearance	Trigger	Clearing limits are clearly marked and disturbance is restricted to the delineated clearance areas. No stockpiling of equipment, soils, or machinery occurs beyond the clearance boundary. No encroachment of vehicles, equipment or works occurs beyond the clearance boundary.	Monitoring verifies that demarcation of clearing limits is not functioning in accordance with their design intent, OR Works activities / vehicle or plant movements have encroached beyond clearing limits.	Monitoring verifies clearing of native vegetation has occurred beyond clearing limits, OR Works activities / vehicle or plant movements that have encroached beyond clearing limits have caused damage to protected areas of vegetation.
	Response	No response required. Continue monitoring program.	Remediate immediately, OR Review work practices of contractors / personnel responsible and provide further site induction to ensure responsibilities are understood.	Reporting to government agencies. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Fauna protection	Trigger	Clearing of native vegetation and habitat features is completed in accordance with Clearance protocols. All fauna species encountered during construction are handled humanely in accordance with industry standards.	Monitoring/review of reporting procedures verifies that Clearing of habitat features is undertaken in the absence of Clearance protocols, but no fauna species encountered.	Monitoring/review of reporting procedures verifies that clearing of habitat features is undertaken in the absence of Clearance protocols, and results in death or injury of fauna species encountered.
	Response	Continue CEMP implementation.	Review work practices of contractors / personnel responsible. Further clearance of native vegetation is to cease until further site induction undertaken to ensure responsibilities are understood.	Reporting to government agencies. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable.
Native vegetation protection	Trigger	Exclusion fencing and protection measures are installed and are functioning in accordance with their design intent.	Monitoring verifies that exclusion fencing and protection measures are not functioning in accordance with their design intent.	Monitoring verifies that works activities / vehicle or plant movements have impacted on areas of native vegetation to be protected.
	Response	Continue CEMP implementation.	Remediate immediately	Reporting to government agencies. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Plant irrigation	Trigger	Irrigation system operating at optimum frequency.	Irrigation system yet to be installed.	Irrigation system fails.
	Response	No response required. Continue to monitor.	Provide additional hand watering until system is installed.	Provide additional hand watering until system is repaired. The irrigation system will be fully functional at all times to ensure that all plants, trees and lawns receive adequate water at optimal frequency.
Plant failure	Trigger	No significant plant failure is present. Monitoring verifies that there is <5% of plants failing.	Monitoring verifies there is plant failure at a rate between 5% -10%	Monitoring verifies there is plant failure at a rate >10%.
	Response	No response required. Continue to monitor.	If the cause of failure is due to a controllable situation then correct situation prior to replacing plants. All planting areas are to be free of grass and weed. Replace plants with one of similar size and quality and identical species. of variety of the ones failed.	If the cause of failure is due to a controllable situation then correct situation prior to replacing plants. All planting areas are to be free of grass and weed. Replace plants with one of similar size and quality and identical species. of variety of the ones failed
Revegetation failure	Trigger	Revegetation is growing to desired design surface levels.	Monitoring verifies that weed emergence has occurred.	Monitoring verifies that weed emergence and plant failure has occurred.
	Response	No response required. Continue to monitor.	Refer to LMP for monitoring requirements once problem has been identified. Possible solutions include the removal of weeds as per Section 5.3.7 of the LMP.	Refer to LMP for monitoring requirements once problem has been identified. Possible solutions include removal of weeds and re-seeding of revegetation cover crop as per Section 5.3.7 of the LMP.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Slope failure	Trigger	No significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the end land use. Monitoring verifies there are no gully or tunnel erosion features, or rill erosion >200mm deep.	Monitoring verifies there is gully or tunnel erosion features, or rill erosion 200mm deep.	Monitoring verifies there is gully or tunnel erosion features, or rill erosion >200mm deep.
	Response	No response required. Continue to monitor.	A suitably trained person to inspect the site. Investigate opportunities to install water management infrastructure to address erosion. Remediate as appropriate.	Undertake a review of the drainage of the area and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable.
Heritage	Trigger	No unknown heritage items uncovered.	Potential heritage item uncovered.	Potential heritage item uncovered causing significant delays to project.
	Response	Continue CEMP implementation.	Stop work and implement the unexpected finds protocol.	Stop work and implement the unexpected finds protocol. Heritage item to be salvaged and removed from site by a qualified archaeologist.
Unexpected Contamination	Trigger	No contamination uncovered during earthworks.	Areas of possible contamination uncovered.	Areas of contamination uncovered.
	Response	Continue CEMP implementation.	Stop work immediately and the contamination assessed according to the UCP (AECOM 2019b).	Stop work immediately and a RAP is to be prepared. A validation report is to be prepared following remediation.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Bushfire	Trigger	No bushfire or bushfire prone weather.	Bushfire prone weather during summer.	Bushfire in the vicinity of the site.
	Response	Continue CEMP implementation.	Ensure grass is kept short and vegetation is minimal at the site. Weather is to be monitored twice daily for chance of bushfire.	Stop work and contact NSW Fire and Rescue on '000'. Evacuate the site as directed by NSW Fire and Rescue.
Submission	Trigger	General feedback/comment (no complaint or query).	Enquiry made by formal or informal channels.	Complaint made by formal or informal channels.
	Response	Acknowledge receipt and record in consultation register. No further response required.	Acknowledge receipt and record in consultation register. Direct enquiry to relevant person for actioning and response within 5 days.	Acknowledge receipt and record in consultation register. Direct enquiry to relevant person for actioning and response within 48 hours
Media	Trigger	Positive story in print, online, radio or television.	Neutral or advisory story in print, online, radio or television.	Negative story in print, online, radio or television.
	Response	Record in consultation register and advise Goodman media/marketing team. No further response required.	Record in consultation register and advise Goodman media/marketing team. No further response required.	Record in consultation register and advise Goodman Project Team for further action and response. Contact relevant person for actioning and response within 48 hours
Unscheduled Event	Trigger	Event occurring outside of plan or schedule without impact or potential impact.	Event occurring outside of plan or schedule with minor impact or potential impact.	Event occurring outside of plan or schedule with major impact or potential impact.
	Response	No response required. Identify opportunities for improvement to manage potential future events.	Contact relevant person for actioning and response within 48 hours. Acknowledge in consultation register. Identify opportunities for improvement to manage potential future events.	Contact relevant person for actioning and response immediately. Acknowledge in consultation register. Identify opportunities for improvement to manage potential future events.

6 Review and Improvement of the CEMP

In accordance with Section 3.12 of G36 (RMS 2018b), review of the CEMP will be undertaken at least quarterly and will include participation by Goodman. The review will comprise, as a minimum, the following:

- Identification of areas of opportunity for improved environmental performance;
- Analysis of the causes of non-compliances, including those identified in environment inspections and audits;
- Verification of the effectiveness of corrective and preventative actions; and
- Highlighting any changes in procedures resulting from process improvement.

Condition D133 of SSD 7348 also states that all strategies, plans and programs required under SSD 7348 must be reviewed within three months of:

- The submission of a Compliance Report under Condition D141;
- The submission of an Environmental Representative Monthly Report under Condition D127;
- The submission of an incident report under Condition D135;
- The approval of any modification of the conditions of this consent; or
- The issue of a direction of the Planning Secretary under Condition D2(b) which requires a review.

This CEMP will also be reviewed and, if necessary, revised in the following circumstances:

- Where there is any change to the scope of the construction activities and/or disturbance footprint;
- Where it is identified that the environmental performance is not meeting the objectives of the CEMP; and/or
- At the request of a relevant regulatory authority.

As per Condition D134 the revised documents will be sent to DPIE within six weeks of review. All employees and contractors will be informed of any revisions to the CEMP by the Contractor's Project Manager during toolbox talks.

7 References

- AECOM (2019a) *Fill Importation Protocol – Oakdale, Western North South Link Road*
- AECOM (2019b) *Unexpected Contamination Protocol – Oakdale, Western North South Link Road*
- Artefact (2019) *Unexpected Finds Protocol – Archaeological Items*
- Ason (2019) *Construction Traffic Management Plan – WNSLR*
- Australian Bushfire Protection Planners (2016) *Bushfire Protection Assessment for the Proposed Oakdale Industrial Estate - West on Lot 11 in DP 1178389, Kemps Creek*
- British Standard (1993) *BS 7385 – Evaluation and measurement for vibration in buildings Part 2*
- Department of Environment and Climate Change (2007) *Storing and Handling of Liquids: Environmental Protection – Participants Manual*
- Department of Environment and Conservation (2006) *Assessing Vibration: a technical guideline*
- Department of Industry (2012) *Guidelines for Controlled Activities on Waterfront Lands*
- Department of Infrastructure, Planning and Natural Resources (2004) *Guideline for the Preparation of Environmental Management Plans*
- Department of Planning and Environment (2018) *Compliance Reporting Post Approval Requirements*
- Ecologique (2019) *Flora and Fauna Management Plan*
- Environment Protection Authority (2007) *Approved Methods for Sampling and Analysis of Air Pollutants in NSW*
- Environment Protection Authority (2014) *Waste Classification Guidelines Part 1: Classifying Waste*
- Environment Protection Authority (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*
- German Institute for Standardisation (Deutsches Institut für Normung) (1999) *DIN 4150 – Structural vibration - Effects of vibration on structures*
- Goodman Property Services (2019) *Consultation Schedules for TfNSW and Water NSW*
- Landcom (2004) *Bluebook – Managing Urban Stormwater, Soils and Construction (Volume 1)*
- Landcom (2008) *Bluebook – Managing Urban Stormwater, Soils and Construction (Volume 2D Main Road Construction)*
- NSW Rural Fire Service (2006) *Planning for Bushfire Protection*
- Office of Environment and Heritage (2011) *Guidelines for Consultants Reporting on Contaminated Sites*
- Pells Sullivan Meynink (2015) *Salinity Management Plan*

Roads and Maritime Services (2011) *Technical Guideline: Temporary Stormwater Drainage for Road Construction*

Roads and Maritime Services (2012) *Environmental Direction: Management of Tannins from Vegetation Mulch*

Roads and Maritime Services (2015) *Guideline for Batter Surface Stabilisation Using Vegetation*

Roads and Maritime Services (2016) *Construction Noise and Vibration Guideline*

Roads and Maritime Services (2018a) *Environmental Incident Classification and Reporting Procedure*

Roads and Maritime Services (2018b) *Landscape Design Guideline*

Roads and Maritime Services (2018c) *QA Specification G36 – Environmental Protection*

Roads and Maritime Services (2018d) *QA Specification G38 – Soil and Water Management*

Roads and Maritime Services (2018e) *QA Specification G40 – Clearing and Grubbing*

Roads and Maritime Services (2018f) *Traffic Control at Work Sites Manual*

Roads and Traffic Authority (2011) *Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects*

Robson Civil Projects (2019a) *Contractor's Environmental Management Plan*

Robson Civil Projects (2019b) *Environmental Management Policy*

Robson Civil Projects (2019c) *Soil and Water Management Plan*

Scape Design (2019) *Western North South Link Road – Landscape Management Plan*

SLR Consulting (2017) *Oakdale West Estate – Waste Management Plan*

SLR Consulting (2019a) *Air Quality Management Plan*

SLR Consulting (2019b) *Community Communications Strategy*

SLR Consulting (2019c) *Compliance Monitoring and Reporting Program*

SLR Consulting (2019d) *Construction Noise and Vibration Management Plan*

Standards Australia (1997) *AS 4282 – 1997: Control of the obtrusive effects of outdoor lighting*

Standards Australia (2001) *AS 2601 – 2001: The Demolition of Structures*

Standards Australia (2007) *AS 4373 – 2007: Pruning of Amenity Trees*

Standards Australia (2009a) *AS 1742.3 – 2009: Manual of uniform traffic control devices*

Standards Australia (2009b) *AS 4970 – 2009: Protection of Trees on Development Sites*

Standards Australia (2016) *AS/NZS 3580.1.1 – 2016: Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment*

Standards Australia (2016) *AS/NZS 3580.9.11 – 2016: Determination of suspended particulate matter - PM₁₀ beta attenuation monitors*

Standards Australia (2017) *AS 2419.1 – 2017: Fire hydrant installations System design, installation and commissioning*

Standards Australia (2017) *AS 5100.1 – 2017: Bridge design - Part 1: Scope and general principles*

Urbis (2017) *Environmental Impact Statement Oakdale West Estate*

WSROC (2004) *Salinity Code of Practice*

APPENDIX A

Development Consent SSD 7348

Development Consent

Section 4.38 of the Environmental Planning and Assessment Act 1979

As delegate of the Minister for Planning and Public Spaces under delegation executed on 11 October 2017, I determine:

- (a) to grant consent to the Stage Development Application referred to in Schedule A subject to the Concept Proposal conditions in Schedule B and C and the Stage 1 Development Application conditions in Schedule D;
- (b) that pursuant to section 4.37 of the *Environmental Planning and Assessment Act 1979*, any subsequent development not being for the purpose of a warehouse or distribution centre with a capital investment value in excess of \$50 million is to be determined by the relevant Consent Authority and that development ceases to be State Significant Development.

These conditions are required to:

- prevent, minimise, or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

Anthea Sargeant
Executive Director
Compliance, Industry and Key Sites

Sydney

13 September,

2019

File: 15/15802

SCHEDULE 1

Application Number:	SSD 7348
Applicant:	Goodman Property Services (Aust) Pty Ltd
Consent Authority:	Minister for Planning and Public Spaces
Site:	Lot 1 DP 663937, Lot 2 DP 1215268, Lot 6 DP 229784, Lot 2 DP 84578, Lot 3 DP 85393 and Lot 11 DP 1178389 2 Aldington Road, Kemp Creek NSW 2178
Development:	A Concept Proposal including: <ul style="list-style-type: none">• concept layout of 22 warehouse buildings inclusive of dock offices and ancillary offices providing 476,000 square metres of gross lettable area, built over five development stages;• concept layout of development lots, internal roads, drainage, landscaping, noise walls, basins and biodiversity offsets; and• development controls

A Stage 1 Development including:

- bulk earthworks across all five stages including retaining walls and noise walls;
- lead in services including but not limited to drainage, power, sewer, water and telecommunications;
- service infrastructure to Precinct 1, including drainage, power, sewer, water and telecommunications;
- construction and operation of three warehouse buildings inclusive of dock offices and ancillary offices in Precinct 1 (1A, 1B and 1C) providing 118,000 square metres of gross lettable area;
- Western North-South Link Road and associated subdivision, basins and drainage;
- estate roads 1, 2 and 6 and eastern part of road 7;
- landscaping of Stage 1, the western boundary, Western North-South Link Road, estate roads 1, 2 and 6 and the eastern part of road 7, detention basins and the amenity lot
- subdivision of Stage 1 lots and road infrastructure including the services (substation) lot;
- stormwater drainage infrastructure for Lots 2A and 2B and all basins;
- temporary works to facilitate construction including but not limited to swales, haul road (construction access), landscaping and basins; and
- works including construction of traffic signals at Lenore Drive/Grady Crescent/WNSLR intersection.

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DEFINITIONS

Applicant	Goodman Property Services (Aust) Pty Ltd, or any person carrying out any development to which this consent applies
Biodiversity Covenant	A restriction on the use of land forming part of the Erskine Park Biodiversity Corridor, as shown on Figure 8 in Appendix 6
Bulk earthworks	As described in the EIS and RtS
Certifying Authority	A person who is authorised by or under section 6.17 of the EP&A Act to issue Part 6 certificates
CEMP	Construction Environmental Management Plan
CAQMP	Construction Air Quality Management Plan
Concept Proposal	Concept layout of 22 warehouse buildings and ancillary offices built over five development stages, as described in the EIS and RtS
Conditions of this consent	Conditions contained in Schedules B to D of this document
Consent Authority	The relevant consent authority for development in accordance with the EP&A Act
Construction	The demolition and removal of buildings or works, the carrying out of works for the purpose of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by this consent
Council	Penrith City Council
CTMP	Construction Traffic Management Plan
Day	The period from 7 am to 6 pm on Monday to Saturday, and 8 am to 6 pm on Sundays and Public Holidays
Demolition	The deconstruction and removal of buildings, sheds and other structures on the site
Department	NSW Department of Planning, Industry and Environment
Development	The development described in the EIS and RtS, including construction and operation of 22 warehouse buildings, offices and associated infrastructure, as modified by the conditions of this consent and shown on the plans in Appendix 1 , Appendix 2 and Appendix 3
DA	Development Application submitted in accordance with the EP&A Act
EIS	The Environmental Impact Statement titled <i>Oakdale West Estate</i> , prepared by Urbis dated November 2017, submitted with the application for consent for the development, including any additional information provided by the Applicant in support of the application
ENM	Excavated Natural Material
Environment	Includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings
Environmental Representative Protocol	The document of the same title published by the Department
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
EPL	Environment Protection Licence under the POEO Act
Erskine Park Biodiversity Corridor	The land described in the <i>Biodiversity Management Plan Erskine Park Employment Area</i> , HLA-Envirosciences, 2006 and shown on Figure 8 in Appendix 6
Evening	The period from 6 pm to 10 pm
Feasible	Feasible relates to engineering considerations and what is practical to build
FFMP	Flora and Fauna Management Plan
Fibre ready facility	As defined in Section 372W of the <i>Telecommunications Act 1997</i>
GLA	Gross lettable area
GFA	Gross floor area

Heritage	Encompasses both Aboriginal and historic heritage including sites that predate European settlement, and a shared history since European settlement
Heritage item	An item as defined under the <i>Heritage Act 1977</i> (NSW), and assessed as being of local, State and/ or National heritage significance, and/or an Aboriginal Object or Aboriginal Place as defined under the <i>National Parks and Wildlife Act 1974</i> (NSW), the World Heritage List, or the National Heritage List or Commonwealth Heritage List under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth), or anything identified as a heritage item under the conditions of this consent
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 <i>Note: "material harm" is defined in this consent</i>
Land	Has the same meaning as the definition of the term in section 1.4 of the EP&A Act
Landscape Bund	Landscaping along the western boundary of the Site, included as part of Stage 1 works as described in the EIS and RTS and shown on Figure 5 in Appendix 2
LMP	Landscape Management Plan
Material harm	Is harm that: <ul style="list-style-type: none"> a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or b) 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)
Minister	NSW Minister for Planning and Public Spaces (or delegate)
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring
Monitoring	Any monitoring required under this consent must be undertaken in accordance with section 9.40 of the EP&A Act
NCC	National Construction Code
Night	The period from 10 pm to 7 am on Monday to Saturday, and 10 pm to 8 am on Sundays and Public Holidays
Non-compliance	An occurrence, set of circumstances or development that is a breach of this consent
NRAR	NSW Natural Resources Asset Regulator
OEH	(former) NSW Office of Environment and Heritage (now Biodiversity and Conservation of the Department)
OEMP	Operational Environmental Management Plan
Operation	The use of warehouse buildings for storage and distribution of goods upon completion of construction
Penrith DCP	Penrith Development Control Plan 2014
Planning Agreement	Planning Agreement titled <i>Oakdale West Estate Planning Agreement</i> , between the Minister for Planning and Public Spaces, Goodman Property Services (Aust) Pty Ltd and BGMG 11 Pty Limited as trustee for the BGMG 1 Oakdale West Trust, executed on 5 August 2019 and included in Appendix 4
PCA	Principal Certifying Authority in accordance with the EP&A Act
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
POEO Act	<i>Protection of the Environment Operations Act 1997</i> (NSW)
Roads Authority	As defined in Dictionary of the <i>Roads Act 1993</i> (NSW)
Reasonable	Means applying judgement in arriving at a decision, taking into account: mitigation benefits, costs of mitigation versus benefits provided, community views, and the nature and extent of potential improvements.
Registered Aboriginal Parties	Means the Aboriginal persons identified in accordance with the document entitled <i>Aboriginal cultural heritage consultation requirements for proponents 2010</i> (DECCW)
Rehabilitation	The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting
Relevant Roads Authority	The authority responsible for ownership and maintenance of the applicable road
RMS	(former) NSW Roads and Maritime Services (now TfNSW)

RtS	The Response to Submissions titled <i>Oakdale West Estate SSDA 15_7348 Response to Submissions</i> prepared by Urbis dated 8 May 2018 and document titled <i>Oakdale West Estate SSDA 15_7348 Response to Matters Raised by the Department of Planning</i> , prepared by Urbis dated 12 October 2018
Sensitive receivers	A location where people are likely to work, occupy or reside, including a dwelling, school, hospital, office or public recreational area
Site	The land defined in Appendix 1
SLR	(proposed) Southern Link Road as shown in the WSEA SEPP and the Broader WSEA SLRN Options Refinement Report prepared by AECOM, 2014
Stage	Each component or Stage of works to deliver the Concept Proposal, as shown on Figure 2 in Appendix 1 , or as amended by an approved Staging Plan under this consent
Stage 1	Bulk earthworks across the Site, construction and operation of three warehouse buildings (1A, 1B and 1C), the WNSLR and associated infrastructure and construction of the landscape bund along the western boundary of the Site, as described in the EIS and RTS and shown on the plans in Appendix 2 and Appendix 3
TfNSW	Transport for New South Wales
VENM	Virgin Excavated Natural Material
Vicinity of the site	Bakers Lane, Kemps Creek
WAD	Works Authorisation Deed issued by TfNSW (former RMS)
Waste	Has the same meaning as the definition of the term in the Dictionary to the POEO Act
Water Pipelines	Two Sydney drinking water pipelines located on land owned by Water NSW along the northern boundary of the Site
WMP	Waste Management Plan
WNSLR	Western North-South Link Road as shown in the WSEA SEPP and the plans in Appendix 3
WSEA	Western Sydney Employment Area
WSEA SEPP	State Environmental Planning Policy (Western Sydney Employment Area) 2009
WSFL	Western Sydney Freight Line corridor as shown in TfNSW Western Sydney Freight Line Corridor Identification – Consultation, March 2018
Year	A period of 12 consecutive months

SCHEDULE B CONDITIONS FOR THE CONCEPT PROPOSAL

FUTURE DEVELOPMENT APPLICATIONS

- B1. In accordance with section 4.22 of the EP&A Act, each stage of the Concept Proposal (excluding Stage 1) is to be subject to future development applications (DAs). Future DAs are to be consistent with this development consent.
- B2. To avoid any doubt, this Concept Proposal consent does not permit the construction or operation of any Development, except for the Stage 1 DA covered by **Schedule D**.
- B3. This Concept Proposal consent does not approve the building layouts shown on Lots 2E, 2F, 2G, 2H, 2J and 4A on **Figure 1** in **Appendix 1**. The location of the buildings on these lots must be assessed by separate DAs, and must satisfy the interface requirements of Conditions C3 and C4.

STATUTORY REQUIREMENTS

- B4. The Applicant shall ensure that all licences, permits, and approvals/consents are obtained as required by law and maintained as required throughout the life of the Concept Proposal. No condition of this consent removes the obligation for the Applicant to obtain, renew or comply with such licences, permits or approvals/consents.

TERMS OF CONSENT

- B5. The Applicant shall carry out the Concept Proposal in accordance with the:
- (a) EIS and RtS;
 - (b) the plans in **Appendix 1** and **Appendix 2**; and
 - (c) the Applicant's Management and Mitigation Measures in **Appendix 7**.
- B6. If there is any inconsistency between the plans and documents referred to above, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.
- B7. The Applicant shall comply with any reasonable requirement(s) of the Planning Secretary arising from the Department's assessment of:
- (a) any reports, plans or correspondence that are submitted in accordance with this consent; and
 - (b) the implementation of any actions or measures contained within these reports, plans or correspondence.

LIMITS OF CONSENT

- B8. This consent lapses five (5) years after the date from which it operates, unless any Stage of the Development has physically commenced on the land to which the consent applies before that date.
- B9. The following limits apply to the Concept Proposal:
- (a) the maximum GLA for the land uses in the Development shall not exceed the limits in **Table 1**;
 - (b) a minimum 60 metre (m) wide corridor along the northern Site boundary shall not be developed and shall be maintained and preserved for the future WSFL corridor, in accordance with the requirements of TfNSW; and
 - (c) the building layouts and footprints shown on Lot 2E, 2F, 2G, 2H, 2J and 4A on **Figure 1** in **Appendix 1**, are not approved. The position, layouts and footprints of the buildings on these lots must be assessed by separate DAs, and must satisfy the interface requirements of Conditions C3 and C4.

Table 1: GLA Maximum for Concept Proposal

Land Use	Maximum GLA square metres (m ²)
Total Warehousing	453,000
Total Office	23,000
Total GLA	476,000

- B10. The Applicant shall ensure the Concept Proposal is consistent with the development controls in **Table 2**:

Table 2: Development Controls

Development Aspect	Control
Minimum building setbacks from:	
• Southern Link Road	20 m
• Western North-South Link Road	20 m
• Local estate Roads	7.5 m
• Western site boundary	40 m
• Southern site boundary	20 m (excluding parking areas)
Rear boundary setbacks within the estate	5 m
Side boundary setbacks within the estate	0 m, subject to compliance with fire rating requirements
Height	15 m
Minimum lot size	5,000 m ²
Minimum frontage	40 m (excluding cul-de-sacs) 35 m minimum lot width at the building line
Site coverage	Maximum of 65 per cent (excluding awnings)

- B11. Notwithstanding the controls listed in **Table 2** in Condition B10, no warehouse building in the Concept Proposal shall exceed a ridgeline height of 13.7 m, excluding roof mounted mechanical plant and solar panels.
- B12. The Applicant shall lodge the proposed revisions to the *Penrith Development Control Plan 2014* (Penrith DCP), in accordance with **Table 2** in Condition B10, with Council within 6 months of the date of this consent.
- B13. The Applicant shall ensure the Concept Proposal provides car parking in accordance with the following rates:
- (a) 1 space per 300 m² of warehouse GFA;
 - (d) 1 space per 40 m² of office GFA; and
 - (e) 2 spaces for disability parking for every 100 car parking spaces.
- B14. The Applicant shall provide bicycle racks, and amenity and change room facilities for cyclists in accordance with *Planning Guidelines for Walking and Cycling* (December 2004, NSW Department of Infrastructure, Planning and Natural Resources and the Roads and Traffic Authority).

STAGING PLAN

- B15. Prior to the commencement of construction of any stage of the Concept Proposal, the Applicant shall prepare a Staging Plan for the Development, to the satisfaction of the Planning Secretary. The plan shall:
- (a) be prepared in consultation with Council, utility and service providers and other relevant stakeholders;
 - (b) describe how the implementation of the Concept Proposal, would be staged to ensure it is carried out in an orderly and economic way and minimises construction impacts on adjacent sensitive receivers;
 - (c) show the likely sequence of DAs that will be lodged to develop the Site, with the estimated timing for each Stage and identification of any overlapping construction and operational activities;
 - (d) include concept design for the staged delivery of landscaping, focusing on early implementation of screen planting to minimise the visual impact of subsequent development stages; and
 - (e) include conceptual design for the provision of services, utilities and infrastructure to the Site.
- B16. The Applicant must:

- (a) not commence construction of any stage of the Development until the Staging Plan required by Condition B15 is approved by the Planning Secretary; and
 - (b) implement the most recent version of the Staging Plan approved by the Planning Secretary.
- B17. The Planning Secretary may require the Applicant to address certain matters identified in the Staging Plan. The Applicant must comply with any such requirements of the Planning Secretary given as part of the Staging Plan approval.

Notes:

- The Applicant may amend the Staging Plan as desired, with the approval of the Planning Secretary.
- The Staging Plan is intended to broadly describe the development sequence for the Site and the delivery of infrastructure for all stages. It is not required to provide detailed design for latter Stages.

NOISE LIMITS

- B18. The Applicant shall ensure the Development does not exceed the noise limits in **Table 3** at the receiver locations N1, N2, N3, N4 and N5 shown on the plan in **Appendix 5**.

Table 3: Noise Limits dB(A)

Location	Day	Evening	Night	
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{A1} (1 minute)
N1 Emmaus Village Residential	44	43	41	51
N3 Kemps Creek – nearest residential property	39	39	37	47
N4 & N5 Kemps Creek – other residences	39	39	37	47
N2 Emmaus Catholic College (school)	When in use: 35 (internal)			

Note: Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the Noise Policy for Industry (EPA 2017).

- B19. The noise limits in **Table 3** do not apply to receiver N3 if the Applicant has a Noise Agreement with the relevant landowner to exceed the noise limits, and the Applicant has provided written evidence to the Planning Secretary that an agreement is in place.

BUSHFIRE PROTECTION

- B20. The Applicant shall ensure the Development complies with:
- (a) the relevant provisions of *Planning for Bushfire Protection 2006*;
 - (b) the construction standards and asset protection zone requirements recommended in the Oakdale Industrial Estate - West Bushfire Protection Assessment, prepared by Australian Bushfire Protection Planners Pty Ltd, dated September 2016; and
 - (c) *AS2419.1 – 2005 Fire Hydrant Installations* for firefighting water supply.

TRANSGRID EASEMENT

- B21. The Applicant must:
- (a) provide safe and unobstructed access for TransGrid plant and personnel to access the transmission towers, lines and easement on the Site, 24 hours a day, 7 days a week;
 - (b) comply with the requirements of TransGrid for any works in the TransGrid easement; and
 - (c) advise TransGrid of any proposed amended or modified encroachment into the easement.

ENDEAVOUR ENERGY

- B22. The Applicant must comply with the requirements of Endeavour Energy for the provision of land for a new zone substation as shown on the plans in the RtS.

WATER NSW

- B23. The Applicant must:

- (a) provide safe and unobstructed access for Water NSW plant and personnel to access the water pipelines corridor adjacent the Site, 24 hours a day, 7 days a week;
- (b) comply with the requirements of Water NSW for any works adjacent to or over, the water pipelines corridor; and
- (c) advise Water NSW of any proposed amended or modified encroachment into the water pipelines corridor.

AMENITIES LOT

- B24. The amenities lot located north of Estate Road 1, as shown on the plans in **Appendix 1**, must only provide for small-scale local services such as commercial, retail, community facilities and landscaping that service or support the needs of local employment-generating uses.

SCHEDULE C CONDITIONS FOR FUTURE DEVELOPMENT APPLICATIONS

DEVELOPMENT CONTRIBUTIONS

- C1. Future DAs shall identify whether any Development Contributions Plan made by Council (under Section 7.11 of the EP&A Act) applies to that stage of the Concept Proposal (excluding Stage 1).
- C2. Prior to the issue of a Construction Certificate for any stage of the Development, the Applicant shall pay contributions to Council in accordance with the relevant Development Contributions Plan identified in accordance with Condition C1.

INTERFACE WITH RESIDENTIAL AREAS

- C3. Future DAs for warehouses on lots 2E, 2F, 2G, 2H, 2J and 4A shall be accompanied by an Urban Design Assessment. The assessment must:
- (a) be prepared by an independent urban design consultant;
 - (b) be prepared in consultation with Council and the Emmaus Catholic College;
 - (c) detail the key objectives for the interface with the sensitive receivers on the western and southern Site boundaries, including consideration of optimal uses and operational hours;
 - (d) determine the optimal building location and setbacks on the western and southern boundaries, noting the design controls in Condition B10 are the minimum setback requirements;
 - (e) present the optimal design for the building layouts along the western and southern site boundaries with detailed justification for the preferred option;
 - (f) identify appropriate orientations and architectural treatments for the facades facing sensitive receivers; and
 - (g) incorporate noise mitigation into the layout and design of buildings, internal roads, loading docks and parking areas to ensure the Development can meet the noise limits in Condition B18.
- C4. Prior to the commencement of construction of warehouses or office buildings on lots 2E, 2F, 2G, 2H, 2J and 4A, the Applicant must obtain approval from the Consent Authority for the preferred design option, including uses, building and loading dock layouts, setbacks, façade treatments and colours.

VISUAL AMENITY

Landscaping

- C5. Future DAs shall be accompanied by a Landscape Assessment. The assessment must:
- (a) be prepared by a qualified landscape design consultant;
 - (b) be prepared in consultation with Council;
 - (c) describe how the landscaping for the relevant Stage of the Development is consistent with the Staging Plan approved in accordance with Condition B15;
 - (d) describes the landscaping works to be completed as part of the relevant Stage of the Development and details a program for monitoring the success of landscaping works over time;
 - (e) assesses the condition of and adequacy of landscaping completed as part of earlier Stages of the Development, in providing visual screening for adjacent sensitive receivers; and
 - (f) details any additional landscaping or rehabilitation works required to ensure the visual impacts of the Development are minimised for the adjacent sensitive receivers.

Outdoor Lighting

- C6. Future DAs must ensure compliance with *AS/NZS 1158.3.1:2005 Pedestrian Area (Category P) Lighting* and *AS/NZS 4282:2019 Control of Obtrusive Effects of Outdoor Lighting*.

Signage

- C7. Future DAs must ensure illuminated signage is oriented away from the sensitive receivers on the western and southern Site boundaries.

Reflectivity

- C8. The visible light reflectivity from materials used on the façades and roofs of the warehouses and office buildings shall be designed to minimise glare. A report demonstrating compliance with these requirements must be submitted to the satisfaction of the Certifying Authority for each future warehouse and office building prior to the issue of the relevant Construction Certificate.

TRANSPORT, ACCESS AND PARKING

- C9. Future DAs shall be accompanied by a transport, access and parking assessment. The assessment must:
- (a) assess the impacts on the safety and capacity of the surrounding road network and access points during construction and operation of the relevant Stage;
 - (b) demonstrate internal roads and car parking complies with relevant Australian Standards and the car parking rates in Condition B13;
 - (c) detail the scope and timing of any required road upgrades to service the relevant Stage; and
 - (d) detail measures to promote non-car travel modes, including a Sustainable Travel Plan identifying pedestrian and cyclist facilities to service the relevant Stage of the Development.

NOISE AND VIBRATION

- C10. Future DAs shall be accompanied by a noise and vibration impact assessment. The assessment must:
- (a) identify the noise and vibration impacts during construction and operation;
 - (b) demonstrate compliance with the noise limits in Condition B18;
 - (c) provide an analysis of all external plant and equipment, including but not limited to, forklifts, air conditioners and refrigeration systems;
 - (d) incorporate noise mitigation measures, such as increased building setbacks, building insulation, noise barriers, layout of truck loading areas or source controls, to demonstrate the noise limits in Condition B18 can be achieved;
 - (e) detail the timing to construct the noise walls shown in **Appendix 5**, to ensure noise from operation of the Development does not exceed the noise limits in Condition B18; and
 - (f) recommend mitigation and management measures to be implemented to minimise noise during construction.

STORMWATER MANAGEMENT

- C11. Future DAs shall demonstrate the design of the warehouses, offices and hardstand areas are consistent with (or the latest revision of) the:
- (a) *Civil, Stormwater and Infrastructure Services Report*, prepared by At&L, dated October 2018; and
 - (b) *Flood Impact Assessment: Oakdale West Estate*, prepared by Cardno, dated 27 March 2017.

BUSHFIRE PROTECTION

- C12. The Applicant shall ensure future DAs comply with:
- (a) the relevant provisions of *Planning for Bushfire Protection 2006*;
 - (b) the construction standards and asset protection zone requirements recommended in the Oakdale Industrial Estate - West Bushfire Protection Assessment, prepared by Australian Bushfire Protection Planners Pty Ltd, dated September 2016; and
 - (c) *AS2419.1 – 2005 Fire Hydrant Installations* for firefighting water supply.

TRANSGRID EASEMENT

- C13. The Applicant must consult with TransGrid, prior to lodging DAs for Stages 4 and 5 of the Development as shown on **Figure 2** in **Appendix 1**, and any other Stage or road infrastructure that may affect the TransGrid easement. The Applicant must design, construct and operate each Stage of the development in accordance with the reasonable requirements of TransGrid relating to their use of the TransGrid easement.
- C14. The Applicant must consult with TransGrid, prior to lodging DAs for buildings in Stage 5 adjacent to Ropes Creek, to identify and implement any required flood management measures within the transmission line easement.

ENDEAVOUR ENERGY

- C15. The Applicant must obtain relevant approvals from Endeavour Energy, prior to the construction of any utility works to service each Stage of the Development.

WATER NSW

- C16. The Applicant must consult with Water NSW, prior to lodging DAs for works on Lot 2A and 2B adjoining the water pipelines corridor, to identify and implement any requirements of Water NSW for protection of the water pipelines corridor.

WASTE

C17. Future DAs shall include a Waste Management Plan prepared in accordance with the *NSW Waste Classification Guidelines* (DECCW, 2009).

CONSTRUCTION MANAGEMENT

C18. A Construction Environmental Management Plan (CEMP) shall be submitted to the Consent Authority for each stage of the Concept Proposal prior to the commencement of construction of the relevant stage. The CEMP must:

- (a) be prepared by a suitably qualified and experienced environmental consultant, or the Environmental Representative appointed for Stage 1 of the Development;
- (b) be prepared in consultation with relevant Government agencies, infrastructure and utility providers, including but not limited to, TransGrid, Endeavour Energy, Water NSW and TfNSW, where relevant for each stage;
- (c) detail the construction activities to be undertaken in the relevant Stage of the Development;
- (d) include detailed procedures for managing the environmental impacts of construction, including stormwater, erosion and sediment controls, dust, noise and traffic management; and
- (e) detail the roles and responsibilities for environmental management on the Site.

COMMUNITY COMMUNICATION STRATEGY

C19. No later than one month before the commencement of construction of any stage of the Development, a Community Communication Strategy (CCS) must be prepared and submitted to the Planning Secretary for approval.

The CCS is to provide mechanisms to facilitate communication between the Applicant, Council and the community (including adjoining affected landowners, schools, businesses, and others directly impacted by Stage 1), during design, construction and operation. The CCS must:

- (a) assign a central contact person to keep the nearby sensitive receivers regularly informed throughout the Development;
- (b) detail the mechanisms for regularly consulting with the local community throughout the Development, such as holding regular meetings to inform the community of the progress of the development and report on environmental monitoring results;
- (c) detail a procedure for consulting with nearby sensitive receivers to schedule high noise generating works, vibration intensive activities or manage traffic disruptions;
- (d) include contact details for key community groups, relevant regulatory authorities, Registered Aboriginal Parties and other interested stakeholders; and
- (e) include a complaints procedure for recording, responding to and managing complaints, including:
 - (i) email, contact telephone number and postal addresses for receiving complaints;
 - (ii) advertising the contact details for complaints before and during operation, via the local newspaper and through onsite signage;
 - (iii) a complaints register to record the date, time and nature of the complaint, details of the complainant and any actions taken to address the complaint; and
 - (iv) procedures for the resolution of any disputes that may arise during the course of the Development.

C20. The Applicant must:

- (a) not commence construction of the relevant stage of the Concept Proposal until the CCS required under Condition C19 has been approved by the Planning Secretary; and
- (b) implement the CCS for each stage of the Concept Proposal and following the completion of operation of the Development.

SCHEDULE D CONDITIONS FOR STAGE 1 DA

PART 1 – GENERAL CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

- D1. In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of Stage 1 development, and any rehabilitation required under this consent.

TERMS OF CONSENT

- D2. Stage 1 of the Development may only be carried out:
- (a) in compliance with the conditions of this consent;
 - (b) in accordance with all written directions of the Planning Secretary;
 - (c) in accordance with the EIS and RTS;
 - (d) in accordance with the plans in **Appendix 2** and **Appendix 3**; and
 - (e) in accordance with the Applicant's Management and Mitigation Measures in **Appendix 7**.
- D3. Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to:
- (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary; and
 - (b) the implementation of any actions or measures contained in any such document referred to in Condition D3(a).
- D4. The conditions of this consent and directions of the Planning Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document listed in Condition D2(c). In the event of an inconsistency, ambiguity or conflict between any of the documents listed in Condition D2(c), the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.

LIMITS OF CONSENT

- D5. This consent lapses five (5) years after the date from which it operates, unless Stage 1 has physically commenced on the land to which the consent applies before that date.
- D6. The following limits apply to Stage 1:
- (a) the maximum GLA for the land uses shall not exceed the limits in **Table 4**; and
 - (b) a minimum 60 m wide corridor along the northern Site boundary shall not be developed and shall be maintained and preserved for the future WSFL corridor, in accordance with the requirements of TfNSW.

Table 4: GLA Maximum for Stage 1

Land Use	Maximum GLA (m ²)
Total Warehousing	111,000
Total Office	7,000
Total GLA	118,000

- D7. The Applicant shall ensure Stage 1 is consistent with the development controls in **Table 2: Development Controls** in Condition B10.

NOTIFICATION OF COMMENCEMENT

- D8. The date of commencement of each of the following phases of Stage 1 must be notified to the Department in writing, at least one month before that date, or otherwise agreed with the Planning Secretary:
- (a) construction; and
 - (b) operation.

- D9. If the construction or operation of Stage 1 is to be delivered in sub-stages, the Department must be notified in writing at least one month before the commencement of each sub-stage, of the date of commencement and the works to be carried out in that sub-stage.

EVIDENCE OF CONSULTATION

- D10. Where conditions of this consent require consultation with an identified party, the Applicant must:
- (a) consult with the relevant party prior to submitting the subject document to the Planning Secretary for approval; and
 - (b) provide details of the consultation undertaken including:
 - i. the outcome of that consultation, matters resolved and unresolved; and
 - ii. details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.

STAGING, COMBINING AND UPDATING STRATEGIES, PLANS OR PROGRAMS

- D11. With the approval of the Planning Secretary, the Applicant may:
- (a) prepare and submit any strategy, plan or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program);
 - (b) combine any strategy, plan or program required by this consent (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined); and
 - (c) update any strategy, plan or program required by this consent (to ensure the strategies, plans and programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development).
- D12. If the Planning Secretary agrees, a strategy, plan or program may be staged or updated without consultation being undertaken with all parties required to be consulted in the relevant condition in this consent.
- D13. If approved by the Planning Secretary, updated strategies, plans or programs supersede the previous versions of them and must be implemented in accordance with the condition that requires the strategy, plan or program.

PROTECTION OF PUBLIC INFRASTRUCTURE

- D14. Before the commencement of construction of Stage 1, the Applicant must:
- (a) consult with the relevant owner and provider of services that are likely to be affected, to make suitable arrangements for access to, diversion, protection and support of the affected infrastructure;
 - (b) prepare a dilapidation report identifying the condition of all public infrastructure in the vicinity of the Site (including roads, gutters and footpaths); and
 - (c) submit a copy of the dilapidation report to the Planning Secretary and Council.
- D15. Unless the Applicant and the applicable authority agree otherwise, the Applicant must:
- (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by carrying out Stage 1; and
 - (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of Stage 1.

PROTECTION OF WATER NSW INFRASTRUCTURE

- D16. Before the commencement of construction of Stage 1, the Applicant must:
- (a) prepare a dilapidation report identifying the condition of all infrastructure within the water pipelines corridor, in the vicinity of the WNSLR bridge crossing;
 - (b) implement all practical measures to protect this infrastructure, as required by Water NSW; and
 - (c) repair, or pay the full costs associated with repairing, any water supply infrastructure that is damaged by carrying out Stage 1.

DEMOLITION

- D17. All demolition must be carried out in accordance with *Australian Standard AS 2601-2001 The Demolition of Structures* (Standards Australia, 2001).

STRUCTURAL ADEQUACY

D18. All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development, must be constructed in accordance with the relevant requirements of the National Construction Code (NCC).

Notes:

- *Under Part 6 of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works.*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.*

COMPLIANCE

D19. The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of Stage 1.

DEVELOPER CONTRIBUTIONS

Planning Agreement

D20. The Applicant shall provide all monetary contributions and/or works-in-kind contributions under Subdivision 2 of Division 7.1 of Part 7 of the EP&A Act, in accordance with the Planning Agreement entered into between the Minister for Planning, Goodman Property Services (Aust) Pty Ltd (the developer) and BGMG 11 Pty Limited as trustee for the BGMG 1 Oakdale West Trust (the landowner) executed on 5 August 2019 and as attached in **Appendix 4**.

OPERATION OF PLANT AND EQUIPMENT

D21. All plant and equipment used on site, or to monitor the performance of Stage 1 must be:

- (a) maintained in a proper and efficient condition; and
- (b) operated in a proper and efficient manner.

EASEMENTS

D22. Within 12 months of commencing operation of Stage 1, or a timing otherwise agreed with Council, an easement under section 88A and/or restriction or public positive covenant under section 88E of the *Conveyancing Act 1919* (NSW) naming the Council as the prescribed authority, which can only be revoked, varied or modified with the consent of the Council, and provides for a drainage outlet swale from bio-retention basin 1, must be registered on title of Lot 19 DP 1250578.

EXTERNAL WALLS AND CLADDING

D23. The external walls of all buildings including additions to existing buildings must comply with the relevant requirements of the NCC.

D24. Before the issue of a Construction Certificate and an Occupation Certificate, the Applicant must provide the Certifying Authority with documented evidence that the products and systems proposed for use or used in the construction of external walls including finishes and claddings such as synthetic or aluminium composite panels comply with the requirements of the NCC.

D25. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Planning Secretary within seven days after the Certifying Authority accepts it.

UTILITIES AND SERVICES

D26. Before the construction of any utility works associated with Stage 1, the Applicant must obtain relevant approvals from service providers.

D27. Before the commencement of operation of Stage 1, the Applicant must obtain a Compliance Certificate for water and sewerage infrastructure servicing Stage 1, under section 73 of the *Sydney Water Act 1994* (NSW).

D28. Before the issue of a Subdivision or Construction Certificate for Stage 1, the Applicant (whether or not a constitutional corporation) is to provide evidence, satisfactory to the Certifying Authority, that arrangements have been made for the provision of communication facilities to Stage 1.

D29. The Applicant must demonstrate that the carrier has confirmed in writing they are satisfied that the fibre ready facilities are fit for purpose.

TRANSGRID EASEMENT

D30. The Applicant must:

- (a) provide safe and unobstructed access for TransGrid plant and personnel to access the transmission towers, lines and easement on the Site, 24 hours a day, 7 days a week;
- (b) comply with the requirements of TransGrid for any works in the TransGrid easement on the Site; and
- (c) advise TransGrid of any proposed amended or modified encroachment into the easement.

WATER NSW

D31. The Applicant must:

- (a) comply with the requirements of Water NSW for any works adjacent to, or over, the water pipelines corridor;
- (b) consult with Water NSW during detailed design of Stage 1 works near the corridor including:
 - (i) design of drainage upgrade works within the corridor;
 - (ii) batters and access tracks;
 - (iii) final bridge design for the WNSLR;
- (c) obtain from Water NSW, an access consent and construction licence to work within the water pipelines corridor, prior to the commencement of construction;
- (d) consult with Water NSW during preparation of the CEMP, in accordance with Condition D119, and attend a site visit with Water NSW personnel, prior to finalising the CEMP, to mark the exact works area for the WNSLR bridge crossing; and
- (e) notify any incidents that affect or could affect the water pipelines corridor to Water NSW on the 24-hour Incident Notification Number **1800 061 069**, as a matter of urgency.

WORKS-AS-EXECUTED PLANS

D32. Before the issue of the final Occupation Certificate for Stage 1, works-as-executed drawings signed by a registered surveyor demonstrating that the stormwater drainage and finished ground levels have been constructed as approved, must be submitted to the PCA.

APPLICABILITY OF GUIDELINES

- D33. References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this consent.
- D34. However, consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.

ADVISORY NOTES

AN1. All licences, permits, approvals and consents as required by law must be obtained and maintained as required for Stage 1. No condition of this consent removes any obligation to obtain, renew or comply with such licences, permits, approvals and consents.

PART 2 – ENVIRONMENTAL PERFORMANCE CONDITIONS

VISUAL AMENITY

Landscape Management Plan

- D35. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Landscape Management Plan (LMP), to the satisfaction of the Planning Secretary. The plan must form part of the CEMP in accordance with Condition D119 and the OEMP in accordance with Condition D130 and must:
- (a) be prepared in consultation with Council;
 - (b) detail procedures for the retention of existing native vegetation in the north-western corner of the Site and protection of this vegetation from construction impacts;
 - (c) include visual impact mitigation measures for construction including but not limited to:
 - (i) the location of site sheds, compounds and machinery parking areas, avoiding the western and southern site boundaries, or other locations highly visible from adjacent residential properties;
 - (ii) procedures for progressive grassing of exposed soil, as soon as reasonably practicable after disturbance, focusing on areas where building construction will occur at a later stage;
 - (d) detail the works required to construct the landscape bund along the western boundary of the Site, as shown on **Figure 5 in Appendix 2**, including provision for the landscaping to incorporate mature trees (no less than 75 litre pot size);
 - (e) include a schedule of works which prioritises the construction of the landscape bund along the western boundary of the Site, as shown on **Figure 5 in Appendix 2**.
 - (f) include a program for implementing the landscape bund as soon as reasonably practicable, and no later than prior to operation of Stage 1;
 - (g) describe the integration of landscaping with fixed elements, including retaining walls and noise walls; and
 - (h) describe the monitoring and maintenance procedures to ensure the success of the landscaping works over the life of the Development.
- D36. The Applicant must:
- (a) not commence construction of Stage 1 until the LMP is approved by the Planning Secretary.
 - (b) must implement the most recent version of the LMP approved by the Planning Secretary; and
 - (c) include the monitoring and maintenance procedures contained in the LMP within the OEMP required in accordance with Condition D130.

Landscaping

- D37. The Applicant must complete the landscape bund along the western boundary of the Site as shown on **Figure 5 in Appendix 2** within six months of commencing any construction including bulk earthworks.
- D38. The Applicant must maintain all landscaping implemented as part of Stage 1, as shown on **Figure 5 in Appendix 2**, for the duration of the Development. If the monitoring carried out as part of Condition D35 indicates that any aspect of the landscaping has not been successful, the Applicant must undertake re-planting and rehabilitation works, as soon as reasonably practicable.

Setbacks

- D39. The Applicant must ensure building services including tanks are integrated into the building design and landscaped areas to reduce visibility from public areas, unless otherwise required by an authority or Australian Standard, to be located within the front boundary setback.

Lighting and Security Cameras

- D40. The Applicant must ensure the lighting associated with Stage 1:
- (a) complies with the latest version of AS 4282-1997 - *Control of the obtrusive effects of outdoor lighting* (Standards Australia, 1997); and
 - (b) is mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network.
- D41. The Applicant must ensure any security cameras installed as part of Stage 1 are directed away from adjacent private properties.

Reflectivity

- D42. The visible light reflectivity from building materials used in the facades and roofs of the warehouses and offices must be designed to minimise glare. A report demonstrating compliance with these requirements is to be submitted to the satisfaction of the Certifying Authority prior to the issue of the relevant Construction Certificate.

Signage and Fencing

- D43. All signage and fencing must be erected in accordance with the plans in the RtS.

Note: *This condition does not apply to temporary construction and safety related signage and fencing.*

- D44. All fencing along building frontages must be located behind the landscape setbacks and not along the front boundary. The fencing must be a maximum height of 2.1 metre and be an open style.

- D45. The Applicant must:

- (a) remove existing rural fencing along the water pipelines corridor adjacent the site and dispose to an appropriate waste facility licensed to accept the waste;
- (b) install and maintain temporary security fencing along the water pipelines corridor adjacent the site, for the duration of construction, or until a permanent fence is installed;
- (c) install permanent 2.4-metre-high fencing along the water pipelines corridor adjacent the site, including the approaches to the WNSLR bridge over the water pipelines corridor and above retaining walls, unless otherwise agreed with Water NSW;
- (d) install concrete barriers or barrier guard rails (including barriers leading up to bridge structure) to the WNSLR where there is potential for large vehicles to drive over retaining walls and into the water pipelines corridor. Barriers must be rated to withstand impact from B-Double size vehicles; and
- (e) install cranked throw screens on both sides of the WNSLR bridge crossing the Water NSW water pipeline corridor.

WESTERN NORTH-SOUTH LINK ROAD (WNSLR)

General Requirements

- D46. The Applicant must design and construct the WNSLR in accordance with the requirements of:

- (a) Council, the PCA and any approval issued under section 138 of the *Roads Act 1993* including the Works Authorisation Deed (WAD);
- (b) TfNSW for the bridge crossing of the future WSFL; and
- (c) Water NSW for the bridge crossing of the water pipelines corridor.

- D47. The Applicant must design and construct the intersections of the WNSLR with Estate Road 1 and Lockwood Road to the satisfaction of the relevant roads authority.

Works at Lenore Drive/Grady Crescent/WNSLR Intersection

- D48. Prior to the commencement of construction of the Lenore Drive/Grady Crescent/WNSLR intersection (the intersection), the Applicant must finalise the detailed design, including a Traffic Signal Plan, for the intersection works. The detailed design must:

- (a) cut back the median further with a taper in Grady Crescent to accommodate the dual B-Double swept paths turning from WNSLR onto Lenore Drive; and
- (b) include an angled pedestrian crossing on the south-eastern corner of the intersection so that pedestrians are not confused by the pedestrian lantern on the opposite side of the intersection.

- D49. The Applicant must enter into a WAD for works at the intersection with TfNSW (former RMS). The WAD must be executed prior to the submission of the detailed design required under condition D48 to TfNSW for approval.

- D50. The Applicant must design the proposed traffic control light at the intersection in accordance with Austroads guidelines, RMS Signal Design Manual and Australian Codes of Practice. The traffic control light design must be endorsed by a suitably qualified practitioner whose qualification has been approved by TfNSW (former RMS).

- D51. The Applicant must submit the certified copies of the traffic signal design plans to TfNSW (former RMS) for approval prior to the issue of a Construction Certificate.

- D52. The Applicant must submit a request to TfNSW (former RMS) Network Operations Team to obtain relevant approvals to remove the signalised pedestrian crossing on the eastern leg of the intersection.

- D53. The Applicant must carry out all public utility adjustment/relocation works necessary for the intersection works as required by relevant public utility authorities and/or their agents.
- D54. The Applicant must make a ten (10) year maintenance contribution for the intersection to TfNSW (former RMS).
- D55. The intersection works must be carried out at no cost to TfNSW (former RMS).

Pre-Construction

- D56. Prior to the commencement of construction of the WNSLR, the Applicant must:
- (a) obtain the written consent of the Minister for Planning and Public Spaces under the Biodiversity Covenant, to construct the WNSLR over the Erskine Park Biodiversity Corridor; and
 - (b) provide evidence to the satisfaction of the Planning Secretary, demonstrating the design of the WNSLR and bridge crossings have been agreed with the relevant roads authority, Council, TfNSW and Water NSW.

Consultation

- D57. The Applicant must develop a schedule for consultation with and approval by TfNSW for the construction of the bridge foundations over the future WSFL, including geotechnical and structural certification as required by TfNSW. The schedule must form part of the CEMP required by Condition D119.
- D58. The Applicant must develop a schedule for consultation with and approval by Water NSW for the construction of the bridge over the water pipelines corridor. This schedule must form part of the CEMP required by Condition D119.

Pre-Operation

- D59. Prior to operation of any Stage of the Development, the Applicant must complete construction of the WNSLR to the satisfaction of the relevant roads authority and the PCA.
- D60. Prior to the commencement of operation of the WNSLR, the Applicant must provide works-as-executed drawings to Water NSW for the WNSLR bridge. The drawings must clearly show any changes to the bridge design or the works adjacent to the water pipelines corridor.
- D61. Prior to the commencement of operation of the WNSLR, the Applicant must design and construct a stormwater management system for the WNSLR. The system must:
- (a) be designed by a suitably qualified and experienced person(s);
 - (b) be generally in accordance with the conceptual design in the RtS;
 - (c) ensure that the system capacity has been designed in accordance with AUSTROADS guidelines;
 - (d) achieve the pollutant reduction targets specified in RMS's *Water Sensitive Urban Design (WSUD) Guidelines* (March 2016) and Council's *Water Sensitive Urban Design (WSUD) Policy* (December 2013); and
 - (e) ensure the outlet structures are designed in accordance with NRAR's *Guidelines for Controlled Activities on Waterfront Land* (May 2018).

Dedication of Infrastructure and Land

- D62. Prior to the completion of construction of the WNSLR, the Applicant must consult with Water NSW regarding land subdivision and stratum arrangements for the acquisition and dedication of Water NSW land to Council for the WNSLR bridge.
- D63. Following completion of construction of the WNSLR to the satisfaction of the relevant roads authority, the Applicant must dedicate the WNSLR and its associated land owned by Water NSW and BGMG 11 Pty Limited as trustee for the BGMG 1 Oakdale West Trust, to the relevant roads authority in accordance with the requirements of the Planning Agreement.
- D64. The Applicant shall retain care, control and ownership of bio-retention basin no. 1 associated with the WNSLR.

TRANSPORT, ACCESS AND PARKING

Construction Traffic Management Plan

- D65. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Construction Traffic Management Plan (CTMP) to the satisfaction of the Planning Secretary. The CTMP must form part of the CEMP required by Condition D119 and must:
- (a) be prepared by a suitably qualified and experienced person(s);

- (b) be prepared in consultation with Council, Mamre Anglican School, Emmaus Catholic College, Emmaus Catholic Care Village and Trinity Catholic Primary School;
- (c) detail specific measures to manage construction traffic to avoid school drop off and pick up times (Monday to Friday 8 am – 9.30 am and 2.30 pm – 4 pm) and Higher School Certificate exam periods, including any temporary infrastructure arrangements and traffic safety measures;
- (d) detail the measures to be implemented to ensure road safety and network efficiency during construction, including scheduling deliveries of heavy plant and equipment outside of peak periods, or during school holidays where possible;
- (e) detail heavy vehicle routes, access and parking arrangements;
- (f) include a Driver Code of Conduct to:
 - i. minimise the impacts of construction on the local and regional road network;
 - ii. minimise conflicts with other road users including the students, staff, visitors and residents of the neighbouring schools and aged care village;
 - iii. minimise road traffic noise, both on Bakers Lane and from construction vehicles on Site; and
 - iv. ensure truck drivers use specified routes and adhere to the speed restrictions on Bakers Lane;
- (g) include a program to monitor the effectiveness of these measures; and
- (h) detail procedures for early notification to residents and the community (including local schools), of any potential disruptions to routes.

D66. The Applicant must:

- (a) not commence construction of Stage 1 until the CTMP required by Condition D65 is approved by the Planning Secretary; and
- (b) implement the most recent version of the CTMP approved by the Planning Secretary for the duration of construction.

Estate Roads and Intersections

D67. The Applicant must design and construct the internal estate roads and intersections to accommodate the turning path of a B-Double, to the satisfaction of the Relevant Roads Authority.

D68. Following the issue of a Subdivision Certificate, the estate roads shall be dedicated to the Relevant Roads Authority. Prior to any dedication, the Applicant shall ensure construction of the estate roads has been completed to the satisfaction of the Relevant Roads Authority and measures (such as a performance bond) are in place for any prescribed maintenance period, to the satisfaction of the Relevant Roads Authority.

Operating Conditions

D69. The Applicant must ensure:

- (a) internal roads, driveways and parking (including grades, turn paths, sight distance requirements, aisle widths, aisle lengths and parking bay dimensions) are constructed and maintained in accordance with the latest version of *AS 2890.1:2004 Parking facilities Off-street car parking* (Standards Australia, 2004) and *AS 2890.2:2002 Parking facilities Off-street commercial vehicle facilities* (Standards Australia, 2002);
- (b) parking for Stage 1 is provided in accordance with the rates in Condition B13;
- (c) the swept path of the longest vehicle entering and exiting the site, as well as manoeuvrability through the site, is in accordance with the relevant Austroads guidelines;
- (d) Stage 1 does not result in any vehicles queuing on the public road network;
- (e) heavy vehicles associated with Stage 1 are not parked on local roads or footpaths in the vicinity of the Site;
- (f) all vehicles are wholly contained on site before being required to stop;
- (g) all loading and unloading of materials are carried out on Site;
- (h) all trucks entering or leaving the Site with loads have their loads covered and do not track dirt onto the public road network; and
- (i) the proposed turning areas in the car parks are kept clear of any obstacles, including parked cars, at all times.

NOISE

Hours of Work

D70. The Applicant must comply with the hours detailed in **Table 5**, unless otherwise agreed in writing by the Planning Secretary.

Table 5: Hours of Work

Activity	Day	Time
Construction	Monday – Friday	7 am to 6 pm
	Saturday	8 am to 1 pm
Operation	Monday – Sunday (including public holidays)	24 hours

D71. Works outside of the hours identified in Condition D70 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 Planning 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 or to prevent environmental harm.

Construction Noise Limits

D72. Stage 1 must be constructed with the aim of achieving the construction noise management levels detailed in the *Interim Construction Noise Guideline* (DECC, 2009) (as may be updated or replaced from time to time). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the Construction Noise and Vibration Management Plan required by Condition D73.

Construction Noise and Vibration Management Plan

D73. The Applicant must prepare a Construction Noise and Vibration Management Plan (CNVMP) for Stage 1, to the satisfaction of the Planning Secretary. The CNVMP must form part of a CEMP in accordance with Condition D119 and must:

- (a) be prepared by a suitably qualified and experienced noise expert;
- (b) describe procedures for achieving the noise management levels in EPA's *Interim Construction Noise Guideline* (DECC, 2009) (as may be updated or replaced from time to time);
- (c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;
- (d) include strategies to minimise impacts to sensitive receivers, including, where practicable, starting noisy equipment away from sensitive receivers and implementing respite periods;
- (e) include strategies that have been developed with the sensitive receivers identified in **Appendix 5** for managing high noise generating works;
- (f) describe the community consultation undertaken to develop the strategies in Condition D73(e);
- (g) include a monitoring program that:
 - (i) includes a protocol for determining exceedances of the relevant conditions in this approval;
 - (ii) evaluates and reports on the effectiveness of the noise and vibration management measures;
 - (iii) include procedures to relocate, modify, mitigate or stop work to ensure compliance with relevant criteria; and
- (h) include a complaints management system that would be implemented for the duration of Stage 1.

D74. The Applicant must:

- (a) not commence construction of Stage 1 until the CNVMP required by Condition D73 is approved by the Planning Secretary; and

- (b) implement the most recent version of the CNVMP approved by the Planning Secretary for the duration of construction.

Operational Noise Limits

- D75. The Applicant shall undertake operation of Stage 1 in a manner that ensures the Development complies with the noise limits for the Concept Proposal in Condition B18 of this consent.

VIBRATION

Vibration Criteria

- D76. Vibration caused by construction works on the site, as measured at any residence or structure outside the site, must be limited to:
- (a) for structural damage, the latest version of *DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures* (German Institute for Standardisation, 1999); and
 - (b) for human exposure, the acceptable vibration values set out in the *Environmental Noise Management Assessing Vibration: a technical guideline* (DEC, 2006) (as may be updated or replaced from time to time).
- D77. Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in Condition D76.
- D78. The limits in Conditions D76 and D77 apply unless otherwise outlined in a CNVMP, approved as part of the CEMP required by Condition D119 of this consent.

SOILS & WATER

Imported Soil

- D79. The Applicant must prepare a Fill Importation Protocol for Stage 1. The protocol must form part of the CEMP required by Condition D119 and must detail the measures to:
- (a) ensure only VENM, ENM, or other material approved in writing by EPA is brought onto the site;
 - (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.

Erosion and Sediment Control

- D80. The Applicant must prepare an Erosion and Sediment Control Plan for Stage 1, including the WNSLR, to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with Condition D119 and must:
- (a) be prepared by a suitably qualified and experienced person(s);
 - (b) be generally consistent with the Erosion and Sediment Control Plans in the RTS and those prepared by the contractor for each sequence of the works, as approved by the PCA;
 - (c) include detailed erosion and sediment controls developed in accordance with the relevant requirements of *Managing Urban Stormwater: Soils and Construction - Volume 1: Blue Book* (Landcom, 2004) guideline; and
 - (d) include procedures for maintaining erosion and sediment controls in efficient working order for the duration of construction, to ensure Stage 1 complies with Condition D82.
- D81. Prior to the commencement of bulk earthworks as part of Stage 1, the Applicant must implement erosion and sediment controls identified by Condition D80 and maintain those controls throughout bulk earthworks and construction, to ensure stormwater flows do not increase in any downstream areas. The Environmental Representative, appointed in accordance with Condition D123, shall make a written statement to the Planning Secretary confirming the erosion and sediment controls are operational, prior to the commencement of bulk earthworks and other construction activities required for Stage 1.

Discharge Limits

- D82. Stage 1 must comply with section 120 of the POEO Act, which prohibits the pollution of waters.

Stormwater Management System

- D83. The Applicant must design, construct and operate a stormwater management system for Stage 1 that:
- (a) is designed by a suitably qualified and experienced person(s);
 - (b) is generally in accordance with the conceptual design in the RtS;
 - (c) is in accordance with applicable Australian Standards;

- (d) ensures the system capacity is designed in accordance with *Australian Rainfall and Runoff* (Engineers Australia, 2016), *Managing Urban Stormwater: Council Handbook* (EPA, 1997) and *Stormwater Drainage Specifications for Building Development* (Penrith Council, May 2018);
 - (e) ensures peak stormwater flows from the Site do not exceed pre-development flows in any downstream areas for all rainfall events up to and including the 1 in 100-year average recurrence interval (ARI);
 - (f) ensures peak stormwater flows from the Site do not exceed existing flows in the Water NSW drainage lines and water pipelines corridor; and
 - (g) achieves the pollutant reduction targets specified in Council's *Water Sensitive Urban Design (WSUD) Policy*, (December 2013).
- D84. All stormwater drainage infrastructure on the Site, including bio-retention basins, shall remain under the care, control and ownership of the registered proprietor of the lots.
- D85. The Applicant shall create a drainage easement for the outlet swales from the bio-retention basins on the site, in accordance with the requirements of Council and Condition D22.

Groundwater

- D86. If groundwater is intersected during construction of Stage 1, the Applicant must:
- (a) obtain the necessary water licences or approvals from NRAR; and
 - (b) develop a Groundwater Management Plan (GMP) for the testing, dewatering, storage, movement and treatment of groundwater, to the satisfaction of NRAR.

Waterfront Land

- D87. The Applicant must carry out all works on or adjacent to waterfront land in accordance with the Department of Industry *Guidelines for Controlled Activities on Waterfront Lands 2012*.

BIODIVERSITY

Flora and Fauna Management Plan

- D88. The Applicant must prepare a Flora and Fauna Management Plan (FFMP) for Stage 1, to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with Condition D119 and must:
- (a) be prepared by a suitably qualified and experienced person(s);
 - (b) describe procedures to manage impacts on biodiversity values during earthworks, clearing and dam decommissioning;
 - (c) include procedures for clearing marking and protecting the areas of vegetation to be retained on the Site, including the mature vegetation in the north-western corner and the Biodiversity Offset Area, established in accordance with Condition D91 adjacent to Ropes Creek; and
 - (d) detail the specific erosion and sediment controls to protect the retained vegetation.
- D89. The Applicant must:
- (a) not commence bulk earthworks until the FFMP required by Condition D88 is approved by the Planning Secretary; and
 - (b) implement the most recent version of the FFMP approved by the Planning Secretary for the duration of bulk earthworks and construction.

Offsets for Stage 1

- D90. Within 12 months of the date of this development consent, or as otherwise agreed with the Planning Secretary, the Applicant must retire 172 ecosystem credits to offset the removal of 4.41 hectares of native vegetation on the Site.

Note: *If the Applicant seeks a variation to the offset rules, the Applicant must demonstrate that reasonable steps have been taken to find like-for-like offsets in accordance with Section 10.5.4.2 of the FBA and Appendix A of the OEH's NSW Biodiversity Offsets Policy for Major Projects 2014.*

In accordance with Principle 3 of the OEH's NSW Biodiversity Offsets Policy for Major Projects 2014, the Policy does not allow variations to the offset rules to be applied to 'threatened species and ecological communities that are considered nationally significant (listed under the Environmental Protection and Biodiversity Conservation Act 1999)'. These must be offset in a like for like manner.

- D91. The Applicant shall establish a Biodiversity Offset Area on the Site, consistent with the area described in the RtS, in accordance with a Biodiversity Stewardship Agreement with the Biodiversity Conservation Trust.

Biodiversity Management Action Plan

D92. The Applicant must maintain the Biodiversity Offset Area on the Site in accordance with a Biodiversity Management Action Plan approved by the Biodiversity Conservation Trust.

Offsets for the WNSLR

D93. Within 12 months of the date of this development consent, or as otherwise agreed with the Planning Secretary, the Applicant must:

- (a) offset 0.42 ha of vegetation lost in the Erskine Park Biodiversity Corridor as a result of the WNSLR by carrying out planting within the area shown in green edging on **Figure 9** in **Appendix 6**; and
- (b) plant the area shown in green edging on **Figure 9** of **Appendix 6** with species similar to those identified for zone 4a, on the south-eastern side of Ropes Creek, in the Biodiversity Management Plan Erskine Park Employment Area (HLA-Envirosciences, 2 May 2006).

D94. The Applicant shall monitor and maintain the planting for a period of six months to ensure a minimum 85% survival rate of the planting.

D95. The Applicant must notify the Planning Ministerial Corporation at least one month before the completion of planting to enable the Planning Ministerial Corporation to arrange ongoing maintenance.

Snake Management Measures

D96. Prior to construction of Stage 1, the Applicant must implement snake management measures to limit, to the extent practicable, movement of snakes from the Site into the adjacent school and retirement village on the western boundary of the Site. The measures shall be detailed in the CEMP required by Condition D119 and shall include, but not be limited to, provision of alternative snake habitat on Site, fencing along the western boundary and installation of snake deterrents.

BUSHFIRE PROTECTION

D97. The Applicant shall ensure Stage 1 complies with:

- (a) the relevant provisions of *Planning for Bushfire Protection 2006*;
- (b) the construction standards and asset protection zone requirements recommended in the Oakdale Industrial Estate - West Bushfire Protection Assessment, prepared by Australian Bushfire Protection Planners Pty Ltd, dated September 2016; and
- (c) *AS2419.1 – 2005 Fire Hydrant Installations* for firefighting water supply.

AIR QUALITY

Dust Minimisation

D98. The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.

D99. During construction of Stage 1, the Applicant must ensure that:

- (a) exposed surfaces and stockpiles are suppressed by regular watering;
- (b) all trucks entering or leaving the Site with loads have their loads covered;
- (c) trucks associated with Stage 1 do not track dirt onto the public road network;
- (d) public roads used by these trucks are kept clean; and
- (e) land stabilisation works are carried out progressively on site to minimise exposed surfaces.

Construction Air Quality Management Plan

D100. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Construction Air Quality Management Plan (CAQMP) to the satisfaction of the Planning Secretary. The CAQMP must form part of the CEMP required by Condition D119 and must:

- (a) be prepared by a suitably qualified and experienced person(s);
- (b) detail and rank all emissions from all construction activities, including particulate emissions;
- (c) describe a program that is capable of evaluating the performance of the construction and determining compliance with key performance indicators;
- (d) identify the control measures that will be implemented for each emission source; and
- (e) nominate the following for each of the proposed controls:
 - (i) key performance indicator;

- (ii) monitoring method;
- (iii) location, frequency and duration of monitoring;
- (iv) record keeping;
- (v) complaints register;
- (vi) response procedures; and
- (vii) compliance monitoring.

D101. The Applicant must:

- (a) not commence construction of Stage 1 until the CAQMP required by Condition D100 is approved by the Planning Secretary; and
- (b) implement the most recent version of the CAQMP approved by the Planning Secretary for the duration of construction.

Odour Management

D102. The Applicant must ensure Stage 1 does not cause or permit the emission of any offensive odour, as defined in the POEO Act.

ABORIGINAL HERITAGE

Statutory Requirements

D103. Prior to the commencement of construction of Stage 1, the Applicant must register identified Aboriginal items or objects on the OEH's Aboriginal Heritage Information Management System (AHIMS) Aboriginal Sites Register.

Archaeological Test Excavation

D104. Prior to the commencement of construction of Stage 1, the Applicant must undertake archaeological test excavation in the identified area of archaeological sensitivity adjacent to Ropes Creek and the ridgeline immediately to the west, that would be impacted by Stage 1. The test excavation must:

- (a) be undertaken in accordance with a methodology developed in consultation with registered Aboriginal parties;
- (b) be undertaken in accordance with the requirements of the Heritage and Community Engagement, Department of Premier and Cabinet (former NSW OEH Heritage Division); and
- (c) include a report detailing any further work, including archaeological salvage and monitoring, conducted in the presence of Aboriginal stakeholders.

D105. The Applicant must not commence construction of Stage 1 until the Archaeological Test Excavation Report is provided to the Heritage and Community Engagement, Department of Premier and Cabinet (former NSW OEH Heritage Division) and the Planning Secretary.

Unexpected Finds Protocol

D106. If any item or object of Aboriginal heritage significance is identified on Site:

- (a) all work in the immediate vicinity of the suspected Aboriginal item or object must cease immediately;
- (b) a 10 m wide buffer area around the suspected item or object must be cordoned off; and
- (c) the Biodiversity and Conservation Division of the Department must be contacted immediately.

D107. Work in the immediate vicinity of the Aboriginal item or object may only recommence in accordance with the provisions of Part 6 of the *National Parks and Wildlife Act 1974* (NSW).

HISTORIC HERITAGE

Unexpected Finds Protocol

D108. If any archaeological relics are uncovered during construction of Stage 1, then all works in the immediate vicinity of the relic must cease immediately. Unexpected finds must be evaluated and recorded in accordance the requirements of Department of Premier and Cabinet, Heritage (former NSW OEH Heritage Division).

HAZARDS AND RISK

Dangerous Goods

D109. The quantities of dangerous goods stored and handled at the Site must be below the threshold quantities listed in the Department of Planning's *Hazardous and Offensive Development Application Guidelines – Applying SEPP 33* at all times.

Bunding

D110. The Applicant must store all chemicals, fuels and oils used on Site in appropriately banded areas in accordance with the requirements of all relevant Australian Standards, and/or EPA's *Storing and Handling of Liquids: Environmental Protection – Participants Manual* (Department of Environment and Climate Change, 2007).

WASTE MANAGEMENT

Waste Storage

D111. Waste must be secured and maintained within designated waste storage areas at all times and must not leave the Site onto neighbouring public or private properties.

Waste Management Plan

D112. The Applicant must implement the Waste Management Plan (WMP) in the EIS for the duration of construction and operation of Stage 1.

Statutory Requirements

D113. The Applicant must assess and classify all liquid and non-liquid wastes to be taken off Site in accordance with the latest version of EPA's *Waste Classification Guidelines Part 1: Classifying Waste* (EPA, 2014) and dispose of all wastes to a facility that may lawfully accept the waste.

D114. Waste generated outside the Site must not be received at the Site for storage, treatment, processing, reprocessing, or disposal.

Pests, Vermin and Noxious Weed Management

D115. The Applicant must:

- (a) implement suitable measures to manage pests, vermin and declared noxious weeds on the Site; and
- (b) inspect the Site on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on Site in sufficient numbers to pose an environmental hazard or cause the loss of amenity in the surrounding area.

Note: For the purposes of this condition, noxious weeds are those species subject to an order declared under the Biosecurity Act 2015 (NSW).

CONTAMINATION

D116. Prior to the commencement of construction of Stage 1, the Applicant must prepare an unexpected finds protocol to ensure that potentially contaminated material is appropriately managed. The procedure must form part of the CEMP in accordance with Condition D119 and must ensure any material identified as contaminated is disposed offsite, with the disposal location and results of testing submitted to the Planning Secretary, prior to its removal from the Site.

COMMUNITY ENGAGEMENT

D117. The Applicant must consult with the community regularly throughout Stage 1, including consultation with the nearby sensitive receivers identified in **Appendix 5**, relevant regulatory authorities, Registered Aboriginal Parties and other interested stakeholders. Community engagement shall be undertaken in accordance with the Community Communication Strategy approved in accordance with Condition C19.

PART 3 – ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

MANAGEMENT PLAN REQUIREMENTS

D118. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:

- (a) details of:
 - (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);
 - (ii) any relevant limits or performance measures and criteria; and
 - (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures;
- (b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;
- (c) a program to monitor and report on the:
 - (i) impacts and environmental performance of Stage 1; and
 - (ii) effectiveness of the management measures set out pursuant to paragraph (b) above;
- (d) 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;
- (e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time;
- (f) a protocol for managing and reporting any:
 - (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);
 - (ii) complaint;
 - (iii) failure to comply with statutory requirements; and
- (g) a protocol for periodic review of the plan.

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

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

D119. The Applicant must prepare a Construction Environmental Management Plan (CEMP) for Stage 1, including the WNSLR, in accordance with the requirements of Condition D118 and to the satisfaction of the Planning Secretary. The Applicant may prepare separate CEMPs for the Stage 1 works and the WNSLR, addressing all relevant requirements of this consent.

D120. Prior to finalising the CEMP, the Applicant must consult with TfNSW (including the former RMS), Council and Water NSW. The Applicant must also attend a site visit with Water NSW personnel to mark the exact works area for the WNSLR bridge crossing.

D121. As part of the CEMP required under Condition D119 of this consent, the Applicant must include:

- (a) detailed procedures for managing bulk earthworks to avoid adverse water quality impacts on Ropes Creek, including, but not limited to:
 - (i) any staging of earthworks to minimise disturbed areas;
 - (ii) limits on the areal extent of earthworks;
 - (iii) progressive grassing of exposed areas, as soon as reasonably practicable, focusing on areas where building construction will occur at a later stage;
- (b) Landscape Management Plan (LMP) (see Condition D35);
- (c) Construction Traffic Management Plan (CTMP) (see Condition D65);
- (d) Consultation Schedule for TfNSW and Water NSW (see Conditions D57 and D58);
- (e) Construction Noise and Vibration Management Plan (CNVMP) (see Condition D73);
- (f) Fill Importation Protocol (see Condition D79) and Erosion and Sediment Control Plan (see Condition D80);
- (g) Flora and Fauna Management Plan (FFMP) (see Condition D88);

- (h) Snake Management Measures (see Condition D96);
- (i) Construction Air Quality Management Plan (CAQMP) (see Condition D100);
- (j) Unexpected Finds Protocol (see Conditions D106 and D108);
- (k) Unexpected Contamination Protocol (see Condition D116); and
- (l) a Community Consultation and Complaints Handling Procedure.

D122. The Applicant must:

- (a) not commence construction of Stage 1 until the CEMP is approved by the Planning Secretary; and
- (b) carry out the construction of Stage 1 in accordance with the CEMP approved by the Planning Secretary and as revised and approved by the Planning Secretary from time to time.

ENVIRONMENTAL REPRESENTATIVE

D123. The Applicant must engage an Environmental Representative (ER) to oversee construction of Stage 1. Construction of Stage 1 must not commence until an ER has been approved by the Planning Secretary and engaged by the Applicant.

D124. The Planning Secretary's approval of an ER must be sought no later than one month before the commencement of construction of Stage 1, or within another timeframe agreed with the Planning Secretary.

D125. The proposed ER must be a suitably qualified and experienced person who was not involved in the preparation of the EIS or RtS and is independent from the design and construction personnel for Stage 1.

D126. The Applicant may engage more than one ER for Stage 1, in which case the functions to be exercised by an ER under the terms of this approval may be carried out by any ER that is approved by the Planning Secretary for the purposes of Stage 1.

D127. For the duration of construction of Stage 1, or as agreed with the Planning Secretary, the approved ER must:

- (a) receive and respond to communication from the Planning Secretary in relation to the environmental performance of Stage 1;
- (b) consider and inform the Planning Secretary on matters specified in the terms of this consent;
- (c) consider and recommend to the Applicant any improvements that may be made to work practices to avoid or minimise adverse impact to the environment and to the community;
- (d) review the CEMP identified in Condition D119 and any other documents that are identified by the Planning Secretary, to ensure they are consistent with requirements in or under this consent, and if so:
 - (i) make a written statement to this effect before submission of such documents to the Planning Secretary (if those documents are required to be approved by the Planning Secretary); or
 - (ii) make a written statement to this effect before the implementation of such documents (if those documents are required to be submitted to the Planning Secretary/Department for information or are not required to be submitted to the Planning Secretary/Department);
- (e) regularly monitor the implementation of the CEMP, and any other documents identified by the Planning Secretary, to ensure implementation is being carried out in accordance with the document and the terms of this consent;
- (f) as may be requested by the Planning Secretary, help plan, attend or undertake audits of Stage 1 commissioned by the Department including scoping audits, programming audits, briefings, and site visits;
- (g) as may be requested by the Planning Secretary, assist the Department in the resolution of community complaints;
- (h) prepare and submit to the Planning Secretary and other relevant regulatory agencies, for information, an **Environmental Representative Monthly Report** providing the information set out in the Environmental Representative Protocol under the heading "Environmental Representative Monthly Reports." The **Environmental Representative Monthly Report** must be submitted within seven calendar days following the end of each month for the duration of the ER's engagement, or as otherwise agreed with the Planning Secretary.

D128. The Applicant must provide the ER with all documentation requested by the ER in order for the ER to perform their functions specified in Condition D127 (including preparation of the ER monthly report), as well as:

- (a) the complaints register; and
- (b) a copy of any assessment carried out by the Applicant of whether proposed work is consistent with the consent (which must be provided to the ER before the commencement of the subject work).

D129. The Planning Secretary may at any time commission an audit of an ER's exercise of its functions under Condition D142. The Applicant must:

- (a) facilitate and assist the Planning Secretary in any such audit; and
- (b) make it a term of their engagement of an ER that the ER facilitate and assist the Planning Secretary in any such audit.

OPERATIONAL ENVIRONMENTAL MANAGEMENT PLAN

D130. The Applicant must prepare an Operational Environmental Management Plan (OEMP) in accordance with the requirements of Condition D118 and to the satisfaction of the Planning Secretary.

D131. As part of the OEMP required under Condition D130 of this consent, the Applicant must include the following:

- (a) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of operation of Stage 1;
- (b) describe the procedures that would be implemented to:
 - (i) keep the local community and relevant agencies informed about the operation and environmental performance of Stage 1;
 - (ii) receive, handle, respond to, and record complaints;
 - (iii) resolve any disputes that may arise;
 - (iv) respond to any non-compliance;
 - (v) respond to emergencies; and
- (c) include the following environmental management plans:
 - (i) Landscape Management Plan (LMP) (see Condition D35);
 - (ii) Flora and Fauna Management Plan (FFMP) (see Condition D88);
 - (iii) Waste Management Plan (WMP) (see Condition D112).

D132. The Applicant must:

- (a) not commence operation until the OEMP is approved by the Planning Secretary; and
- (b) operate Stage 1 in accordance with the OEMP approved by the Planning Secretary (and as revised and approved by the Planning Secretary from time to time).

REVISION OF STRATEGIES, PLANS AND PROGRAMS

D133. Within three months of:

- (a) the submission of a Compliance Report under Condition D141;
 - (b) the submission of an Environmental Representative Monthly Report under Condition D127;
 - (c) the submission of an incident report under Condition D135;
 - (d) the approval of any modification of the conditions of this consent; or
 - (e) the issue of a direction of the Planning Secretary under Condition D2(b) which requires a review,
- the strategies, plans and programs required under this consent must be reviewed.

D134. If necessary, to either improve the environmental performance of Stage 1, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval within six weeks of the review.

Note: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of Stage 1.

REPORTING AND AUDITING

Incident Notification, Reporting and Response

D135. The Department must be notified in writing to compliance@planning.nsw.gov.au immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one) and set out the location and nature of the incident. Subsequent notification requirements must be given, and reports submitted in accordance with the requirements set out in **Appendix 8**.

Non-Compliance Notification

D136. The Department must be notified in writing to compliance@planning.nsw.gov.au within seven (7) days after the Applicant becomes aware of any non-compliance.

D137. A non-compliance 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 and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

D138. A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

Compliance Reporting

D139. No later than 6 weeks before the date notified for the commencement of construction, a Compliance Monitoring and Reporting Program prepared in accordance with the Compliance Reporting Post Approval Requirements (Department 2018) must be submitted to the Department.

D140. Compliance Reports of the Development must be carried out in accordance with the Compliance Reporting Post Approval Requirements (Department 2018).

D141. The Applicant must make each Compliance Report publicly available no later than 60 days after submitting it to the Department and notify the Department in writing at least 7 days before this is done.

Monitoring and Environmental Audits

D142. Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance reporting and independent auditing.

Note: For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an "environmental audit" is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.

ACCESS TO INFORMATION

D143. At least 48 hours before the commencement of construction until the completion of all works under this consent, the Applicant must:

- (a) make the following information and documents (as they are obtained or approved) publicly available on its website:
 - (i) the documents referred to in Condition D2 of this consent;
 - (ii) all current statutory approvals for the Development;
 - (iii) all approved strategies, plans and programs required under the conditions of this consent;
 - (iv) the proposed staging plans for the Development if the construction, operation or decommissioning of the Development is to be staged;
 - (v) regular reporting on the environmental performance of the Development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent;
 - (vi) a comprehensive summary of the monitoring results of the Development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;
 - (vii) a summary of the current stage and progress of the Development;
 - (viii) contact details to enquire about the Development or to make a complaint;
 - (ix) a complaints register, updated monthly;

- (x) the Compliance Report of the Development;
 - (xi) audit reports prepared as part of any monitoring or environmental audit of the Development and the Applicant's response to the recommendations in any audit report;
 - (xii) any other matter required by the Planning Secretary; and
- (b) keep such information up to date, to the satisfaction of the Planning Secretary.

APPENDIX 1 CONCEPT PROPOSAL

Table 6: Schedule of Approved Plans – Concept Proposal

Architectural Plans prepared by SBA Architects		
Drawing	Title	Date
OAK MP 02 (AW)	SSDA Estate Masterplan	21 Sept 2018
OAK MP 03 (X)	Western North South Link Road	21 Sept 2018
OAK MP 07 (U)	Indicative Ultimate Lot Layout	21 Sept 2018
OAK MP 13 (S)	Fire Protection Plan	21 Sept 2018
OAK MP 14 (Y)	Biodiversity Management Plan	21 Sept 2018

Landscape Plans prepared by Site Image Architects			
Drawing	Title	Issue	Date
LC-002	Landscape Concept Master Plan	G	11.10.2018
LC-003	Landscape Concept Master Plan	G	11.10.2018
LC-004	Vegetation Typologies	G	11.10.2018
LC-005	Vegetation Typologies	G	11.10.2018
LC-006	Vegetation Typologies – Indicative Species List and Reference Table	G	11.10.2018
LC-008	Street Tree Master Plan	G	11.10.2018
LC-011	Boundary Landscape Treatment Key Plan	G	11.10.2018
LC-012	Western Boundary Treatment Plan	G	11.10.2018

Civil Plans prepared by AT&L			
Drawing	Title	Issue	Date
15-272-C0001	General Arrangement Master Plan	A4	05-10-18
15-272-C0003	Precinct Plan	A3	21-09-18
15-272-C0006	Cut/Fill Plan	A3	21-09-18
15-272-C0008	Stormwater Drainage Catchment Plan (Developed)	A3	21-09-18
15-272-C0009	Erosion and Sediment Control Master Plan	A2	21-09-18
15-272-C0010	Typical Sections Sheet 1	A3	21-09-18
15-272-C0011	Typical Sections Sheet 2	A3	21-09-18
15-272-C0012	Typical Sections Sheet 3	A3	21-09-18
15-272-C0013	Typical Sections Sheet 4	A2	21-09-18

SEE DRAWING OAK MP03 FOR CONTINUATION



Site Area Schedule	
Total Site Area	154.12 ha
Less:	
Non Developable Land	20.77 ha
Easements	22.45 ha
Regional Roads	6.59 ha
Services Lot	1.28 ha
Estate Roads	8.62 ha
E2 Zone non developable	1.43 ha
Development Areas	61.12 ha
Predict 1	21.40 ha
Predict 2	19.51 ha
Predict 3	18.50 ha
Predict 4	22.39 ha
Predict 5	6.02 ha
Proposed Future Development	4.85 ha
Amenities Lot	.323 ha
Total Developable	93.00 ha
Total Warehouse	452,493 sqm
Total Office	22,776 sqm
Total Facility	475,269 sqm

Figure 1: Concept Proposal Layout

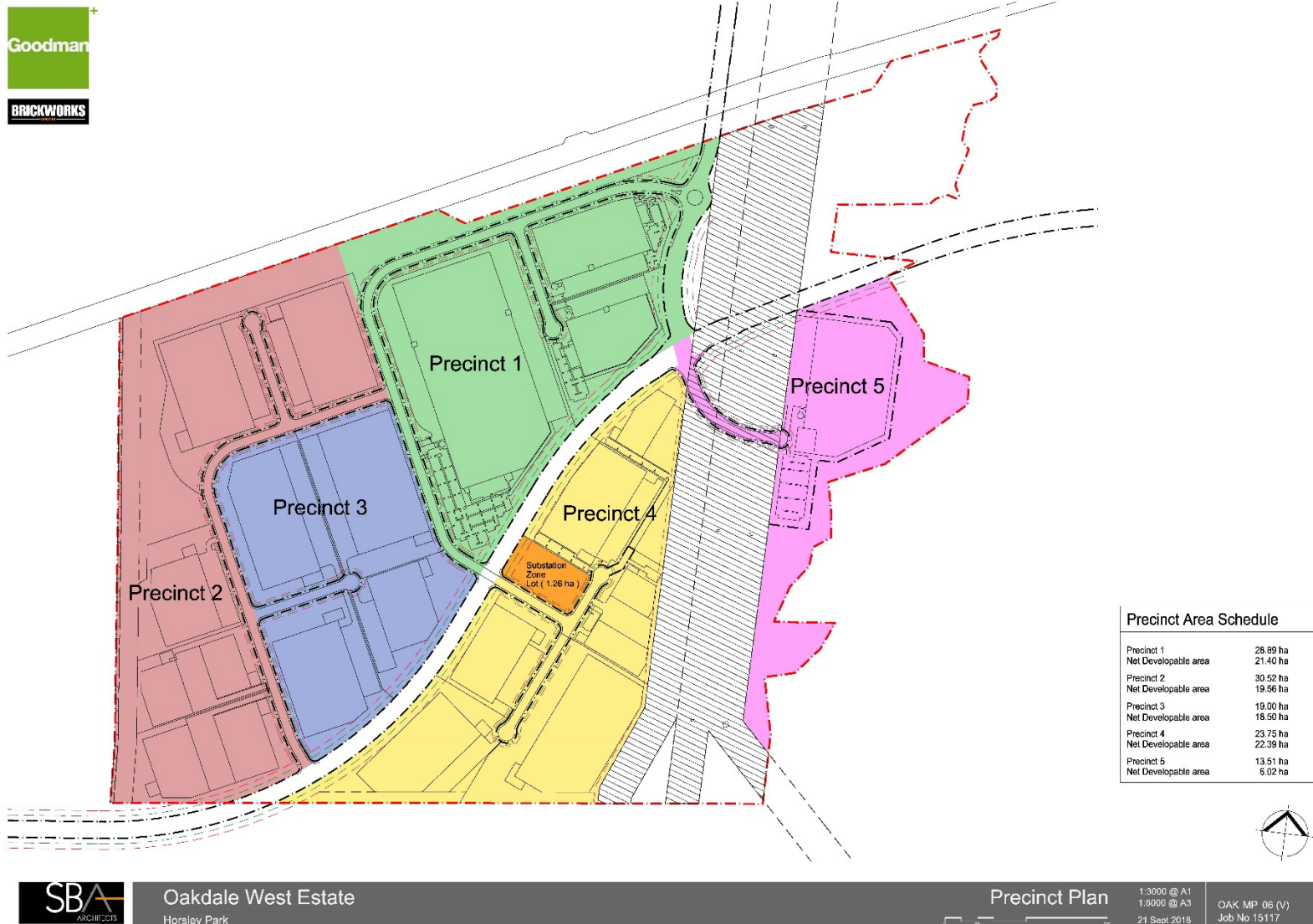


Figure 2: Staging Plan

APPENDIX 2 STAGE 1 DA PLANS

Table 7: Schedule of Approved Plans – Stage 1 DA

Architectural Plans prepared by SBA Architects		
Drawing	Title	Date
OAK MP 04 (Z)	SSDA Stage 1 Development – Precinct 1	21 Sept 2018
OAK MP 05 (Z)	Precinct 1 Plan	21 Sept 2018
OAK MP 12 (12)	Signage Precinct 1 Plan	21 Sept 2018
Building 1A plans prepared by SBA Architects		
OAK 1A DA 10 (H)	Site Plan/Floor Plan	04 May 2018
OAK 1A DA 11 (C)	Roof Plan	03 April 2017
OAK 1A DA 12 (C)	Office Plan – Ground Floor	06 Sept 2016
OAK 1A DA 13 (c)	Office Plan – First Floor	06 Sept 2016
OAK 1A DA 14 (C)	Elevations Office	06 Sept 2016
OAK 1A DA 15 (C)	Elevations 1A	03 April 2017
OAK 1A DA 16 (D)	Sections	4 May 2018
Building 1B plans prepared by SBA Architects		
OAK 1B DA 20 (F)	Site Plan/Floor Plan	17 April 2018
OAK 1B DA 21 (C)	Roof Plan	06 Sept 2016
OAK 1B DA 22 (B)	Office Plan	06 Sept 2016
OAK 1B DA 24 (B)	Elevations Office	06 Sept 2016
OAK 1B DA 25(B)	Elevations 1B	06 Sept 2016
OAK 1B DA 26 (B)	Sections	06 Sept 2016
Building 1C plans prepared by SBA Architects		
OAK 1C DA 30 (H)	Site Plan/Floor Plan	17 April 2018
OAK 1C DA 31 (C)	Roof Plan	03 April 2017
OAK 1C DA 32 (B)	Office Plan – Ground Floor	06 Sept 2016
OAK 1C DA 33 (B)	Office Plan – First Floor	06 Sept 2016
OAK 1C DA 34 (B)	Elevations Office	06 Sept 2016
OAK 1C DA 35 (C)	Elevations Sheet 1	03 April 2017
OAK 1C DA 36 (C)	Elevations Sheet 2	03 Sept 2017
OAK 1C DA 37 (C)	Sections	03 April 2017

Landscape Plans prepared by Site Image Landscape Architects			
Drawing	Title	Issue	Date
ELW-101	-	G	11.10.2018
ELW-102	-	G	11.10.2018
ELW-103	-	G	11.10.2018
ELW-104	-	G	11.10.2018
ELW-105	-	G	11.10.2018
ELW-106	-	G	11.10.2018
ELW-107	-	G	11.10.2018
ELW-108	-	G	11.10.2018
ELW-109	-	G	11.10.2018
ELW-110	-	G	11.10.2018
ELW-111	-	G	11.10.2018
ELW-112	-	G	11.10.2018
ELW-113	-	G	11.10.2018
ELW-114	-	G	11.10.2018
WNSLR-101	-	G	11.10.2018
WNSLR-102	-	G	11.10.2018
ELW-502	Plant Schedule	G	11.10.2018
OLW-001	Precinct 1 Landscape Plan	G	11.10.2018
OLW-501	Planting Palette	G	11-10-2018

Civil Plans prepared by AT&L			
Drawing	Title	Issue	Date
15-272-C0004	Stage 1 SSD Approval Extents Sheet 1 of 2	A5	11-10-18
15-272-C0005	Stage 1 SSD Approval Extents Sheet 2 of 2	A4	21-09-18
15-272-C0020	Western North-South Link Road General Arrangement Plan	A3	21-09-18
15-272-C0022	Western North-South Link Road Stormwater Drainage Catchment Plan (Developed)	A3	21-09-18

15-272-C1004	Typical Site Sections Sheet 1 of 6	A4	21-09-18
15-272-C1005	Typical Site Sections Sheet 2 of 6	A4	21-09-18
15-272-C1006	Typical Site Sections Sheet 3 of 6	A4	21-09-18
15-272-C1007	Typical Site Sections Sheet 4 of 6	A3	21-09-18
15-272-C1008	Typical Site Sections Sheet 5 of 6	A3	11-10-18
15-272-C1009	Typical Site Sections Sheet 6 of 6	A4	28-09-18
15-272-C1010	Typical Road Sections	A3	21-09-18
15-272-C1015	Earthworks and Stormwater Drainage Plan Sheet 1 of 20	A3	21-09-18
15-272-C1016	Earthworks and Stormwater Drainage Plan Sheet 2 of 20	A3	21-09-18
15-272-C1017	Earthworks and Stormwater Drainage Plan Sheet 3 of 20	A3	21-09-18
15-272-C1018	Earthworks and Stormwater Drainage Plan Sheet 4 of 20	A3	21-09-18
15-272-C1019	Earthworks and Stormwater Drainage Plan Sheet 5 of 20	A3	21-09-18
15-272-C1020	Earthworks and Stormwater Drainage Plan Sheet 6 of 20	A3	21-09-18
15-272-C1021	Earthworks and Stormwater Drainage Plan Sheet 7 of 20	A3	21-09-18
15-272-C1022	Earthworks and Stormwater Drainage Plan Sheet 8 of 20	A3	21-09-18
15-272-C1023	Earthworks and Stormwater Drainage Plan Sheet 9 of 20	A3	21-09-18
15-272-C1024	Earthworks and Stormwater Drainage Plan Sheet 10 of 20	A3	21-09-18
15-272-C1025	Earthworks and Stormwater Drainage Plan Sheet 11 of 20	A3	21-09-18
15-272-C1026	Earthworks and Stormwater Drainage Plan Sheet 12 of 20	A3	21-09-18
15-272-C1027	Earthworks and Stormwater Drainage Plan Sheet 13 of 20	A3	21-09-18
15-272-C1028	Earthworks and Stormwater Drainage Plan Sheet 14 of 20	A3	21-09-18
15-272-C1029	Earthworks and Stormwater Drainage Plan Sheet 15 of 20	A4	04-10-18
15-272-C1030	Earthworks and Stormwater Drainage Plan Sheet 16 of 20	A3	21-09-18
15-272-C1031	Earthworks and Stormwater Drainage Plan Sheet 17 of 20	A3	21-09-18
15-272-C1032	Earthworks and Stormwater Drainage Plan Sheet 18 of 20	A3	21-09-18
15-272-C1033	Earthworks and Stormwater Drainage Plan Sheet 19 of 20	A3	21-09-18
15-272-C1034	Earthworks and Stormwater Drainage Plan Sheet 20 of 20	A3	21-09-18
15-272-C1040	Roadworks and Stormwater Drainage Plan Sheet 1 of 10	A3	21-09-18
15-272-C1041	Roadworks and Stormwater Drainage Plan Sheet 2 of 10	A3	21-09-18
15-272-C1042	Roadworks and Stormwater Drainage Plan Sheet 3 of 10	A3	21-09-18
15-272-C1043	Roadworks and Stormwater Drainage Plan Sheet 4 of 10	A3	21-09-18
15-272-C1044	Roadworks and Stormwater Drainage Plan Sheet 5 of 10	A3	21-09-18
15-272-C1045	Roadworks and Stormwater Drainage Plan Sheet 6 of 10	A3	21-09-18
15-272-C1046	Roadworks and Stormwater Drainage Plan Sheet 7 of 10	A3	21-09-18
15-272-C1047	Roadworks and Stormwater Drainage Plan Sheet 8 of 10	A3	21-09-18
15-272-C1048	Roadworks and Stormwater Drainage Plan Sheet 9 of 10	A2	21-09-18
15-272-C1049	Roadworks and Stormwater Drainage Plan Sheet 10 of 10	A2	21-09-18
15-272-C1050	Road and Longitudinal Sections Sheet 1 of 5	A3	21-09-18
15-272-C1051	Road and Longitudinal Sections Sheet 2 of 5	A3	21-09-18
15-272-C1052	Road and Longitudinal Sections Sheet 3 of 5	A3	21-09-18
15-272-C1053	Road and Longitudinal Sections Sheet 4 of 5	A3	21-09-18
15-272-C1054	Road and Longitudinal Sections Sheet 5 of 5	A3	21-09-18
15-272-C1062	Bio-Retention Basin No. 3 Detail Plan Sheet 1 of 2	A3	21-09-18
15-272-C1063	Bio-Retention Basin No. 3 Detail Plan Sheet 2 of 2	A2	21-09-18
15-272-C1064	Bio-Retention Basin No. 5 Detail Plan Sheet 1 of 2	A1	21-09-18
15-272-C1065	Bio-Retention Basin No. 5 Detail Plan Sheet 2 of 2	A3	21-09-18
15-272-C1066	Bio-Retention Basin No. 6 Detail Plan	A3	21-09-18
15-272-C1070	Retaining Wall General Arrangement Plan	A4	11-10-18
15-272-C1071	Retaining Wall Profiles Sheet 1 of 7	A3	21-09-18
15-272-C1072	Retaining Wall Profiles Sheet 2 of 7	A3	21-09-18
15-272-C1073	Retaining Wall Profiles Sheet 3 of 7	A3	21-09-18
15-272-C1074	Retaining Wall Profiles Sheet 4 of 7	A3	21-09-18
15-272-C1075	Retaining Wall Profiles Sheet 5 of 7	A3	21-09-18
15-272-C1076	Retaining Wall Profiles Sheet 6 of 7	A3	21-09-18
15-272-C1077	Retaining Wall Profiles Sheet 7 of 7	A2	21-09-18
12-272-C1080	Stage 1 Services and Utilities Coordination Plan Sheet 1 of 6	A3	21-09-18
12-272-C1081	Stage 1 Services and Utilities Coordination Plan Sheet 2 of 6	A3	21-09-18
12-272-C1082	Stage 1 Services and Utilities Coordination Plan Sheet 3 of 6	A3	21-09-18
12-272-C1083	Stage 1 Services and Utilities Coordination Plan Sheet 4 of 6	A3	21-09-18
12-272-C1084	Stage 1 Services and Utilities Coordination Plan Sheet 5 of 6	A3	21-09-18
12-272-C1085	Stage 1 Services and Utilities Coordination Plan Sheet 6 of 6	A3	21-09-18
12-272-C1090	Erosion and Sediment Control Plan Sheet 1 of 7	A3	21-09-18
12-272-C1091	Erosion and Sediment Control Plan Sheet 2 of 7	A3	21-09-18
12-272-C1092	Erosion and Sediment Control Plan Sheet 3 of 7	A3	21-09-18

12-272-C1093	Erosion and Sediment Control Plan Sheet 4 of 7	A3	21-09-18
12-272-C1094	Erosion and Sediment Control Plan Sheet 5 of 7	A3	21-09-18
12-272-C1095	Erosion and Sediment Control Plan Sheet 6 of 7	A3	21-09-18
12-272-C1096	Erosion and Sediment Control Plan Sheet 7 of 7	A3	21-09-18
12-272-C1097	Erosion and Sediment Control Details	A1	21-09-18
15-272-C2003	General Arrangement Plan	A3	21-09-18
15-272-C2010	Siteworks and Stormwater Drainage Plan Sheet 1 of 15	A3	21-09-18
15-272-C2011	Siteworks and Stormwater Drainage Plan Sheet 2 of 15	A3	21-09-18
15-272-C2012	Siteworks and Stormwater Drainage Plan Sheet 3 of 15	A3	21-09-18
15-272-C2013	Siteworks and Stormwater Drainage Plan Sheet 4 of 15	A3	21-09-18
15-272-C2014	Siteworks and Stormwater Drainage Plan Sheet 5 of 15	A3	21-09-18
15-272-C2015	Siteworks and Stormwater Drainage Plan Sheet 6 of 15	A3	21-09-18
15-272-C2016	Siteworks and Stormwater Drainage Plan Sheet 7 of 15	A3	21-09-18
15-272-C2017	Siteworks and Stormwater Drainage Plan Sheet 8 of 15	A3	21-09-18
15-272-C2018	Siteworks and Stormwater Drainage Plan Sheet 9 of 15	A3	21-09-18
15-272-C2019	Siteworks and Stormwater Drainage Plan Sheet 10 of 15	A3	21-09-18
15-272-C2020	Siteworks and Stormwater Drainage Plan Sheet 11 of 15	A3	21-09-18
15-272-C2021	Siteworks and Stormwater Drainage Plan Sheet 12 of 15	A3	21-09-18
15-272-C2022	Siteworks and Stormwater Drainage Plan Sheet 13 of 15	A3	21-09-18
15-272-C2023	Siteworks and Stormwater Drainage Plan Sheet 14 of 15	A3	21-09-18
15-272-C2024	Siteworks and Stormwater Drainage Plan Sheet 15 of 15	A3	21-09-18
15-272-C2030	Pavement Plan	A3	21-09-18
15-272-C3003	General Arrangement Plan	A3	21-09-18
15-272-C3010	Typical Road Sections	A3	21-09-18
15-272-C3020	Roadworks Plan and Longitudinal Section Sheet 1 of 5	A3	21-09-18
15-272-C3021	Roadworks Plan and Longitudinal Section Sheet 2 of 5	A3	21-09-18
15-272-C3022	Roadworks Plan and Longitudinal Section Sheet 3 of 5	A3	21-09-18
15-272-C3023	Roadworks Plan and Longitudinal Section Sheet 4 of 5	A3	21-09-18
15-272-C3024	Roadworks Plan and Longitudinal Section Sheet 5 of 5	A3	21-09-18
15-272-C3030	Road Longitudinal Sections	A3	21-09-18
15-272-C3040	Bridge Elevation and Typical Section	A4	04-10-18
15-272-C3050	Stormwater Drainage Plan Sheet 1 of 5	A3	21-09-18
15-272-C3051	Stormwater Drainage Plan Sheet 2 of 5	A3	21-09-18
15-272-C3052	Stormwater Drainage Plan Sheet 3 of 5	A3	21-09-18
15-272-C3053	Stormwater Drainage Plan Sheet 4 of 5	A3	21-09-18
15-272-C3054	Stormwater Drainage Plan Sheet 5 of 5	A3	21-09-18
15-272-C3058	Stormwater Drainage Catchment Plan (Post-Developed)	A2	21-09-18
15-272-C3060	Bio-Retention Basin NO. 1 Detail Plan	A3	21-09-18
15-272-C3070	Pavement Plan Sheet 1 of 5	A3	21-09-18
15-272-C3071	Pavement Plan Sheet 2 of 5	A3	21-09-18
15-272-C3072	Pavement Plan Sheet 3 of 5	A3	21-09-18
15-272-C3073	Pavement Plan Sheet 4 of 5	A3	21-09-18
15-272-C3074	Pavement Plan Sheet 5 of 5	A2	21-09-18
15-272-C3080	Retaining Wall Plan and Elevation	A1	21-09-18
15-272-C3081	Retaining Wall Sections Sheet 1 of 4	A1	21-09-18
15-272-C3082	Retaining Wall Sections Sheet 2 of 4	A1	21-09-18
15-272-C3083	Retaining Wall Sections Sheet 3 of 4	A1	21-09-18
15-272-C3084	Retaining Wall Sections Sheet 4 of 4	A1	21-09-18

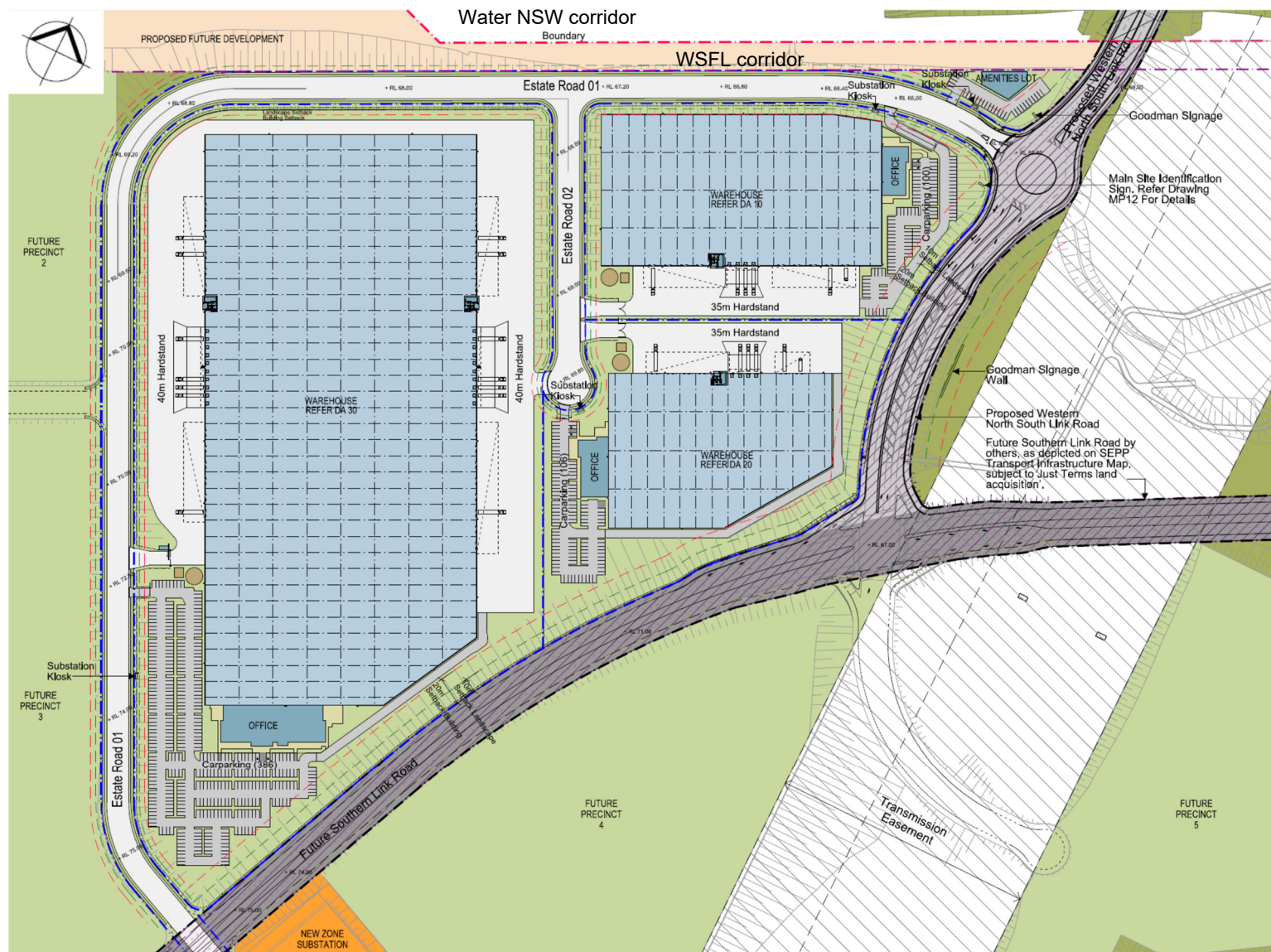


Figure 4: Stage 1 DA Detail



Figure 5: Stage 1 Landscape Plan

APPENDIX 3 WNSLR PLANS

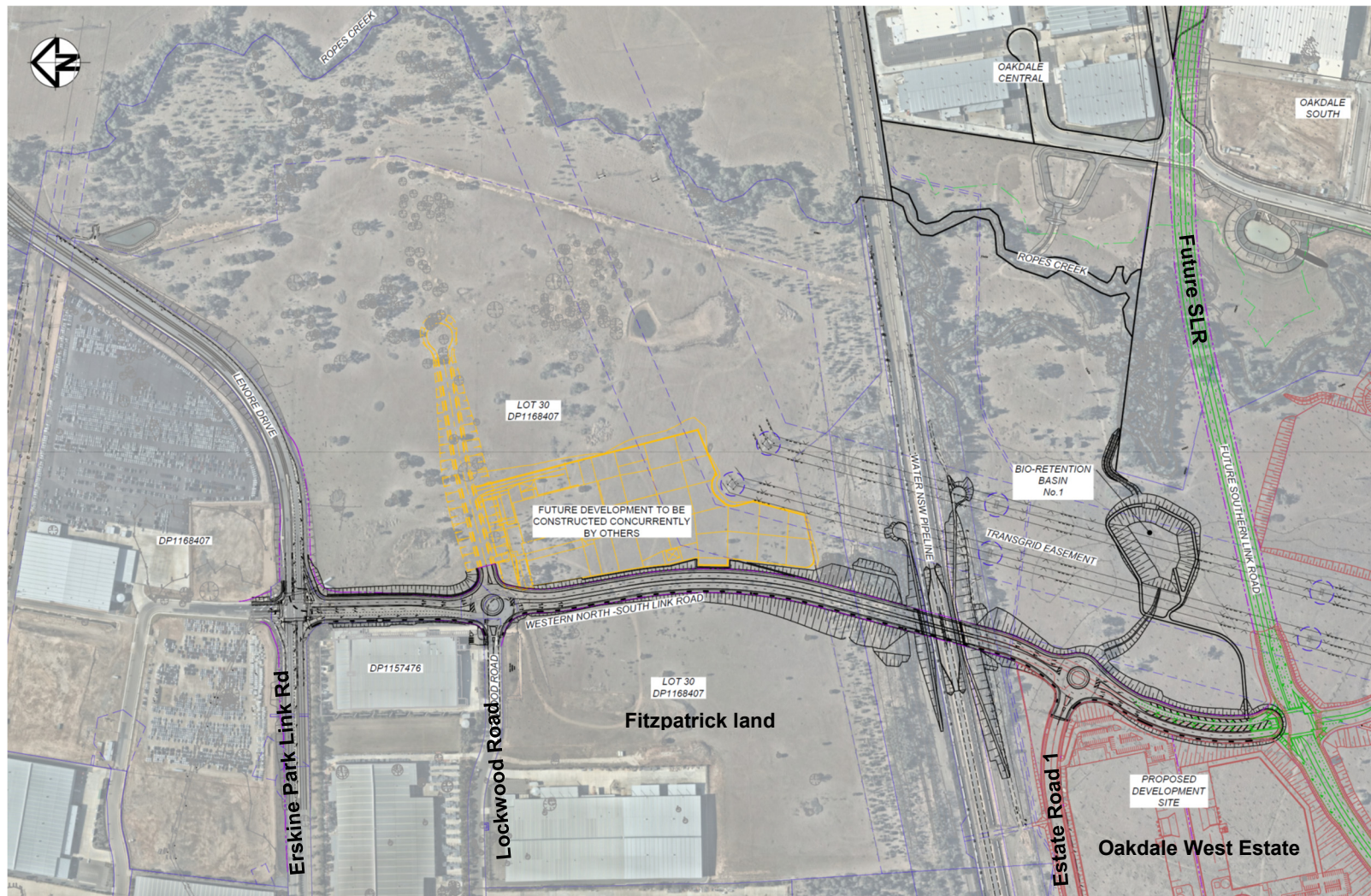


Figure 6: WNSLR

APPENDIX 4 PLANNING AGREEMENT

APPENDIX 5 NOISE RECEIVER LOCATIONS

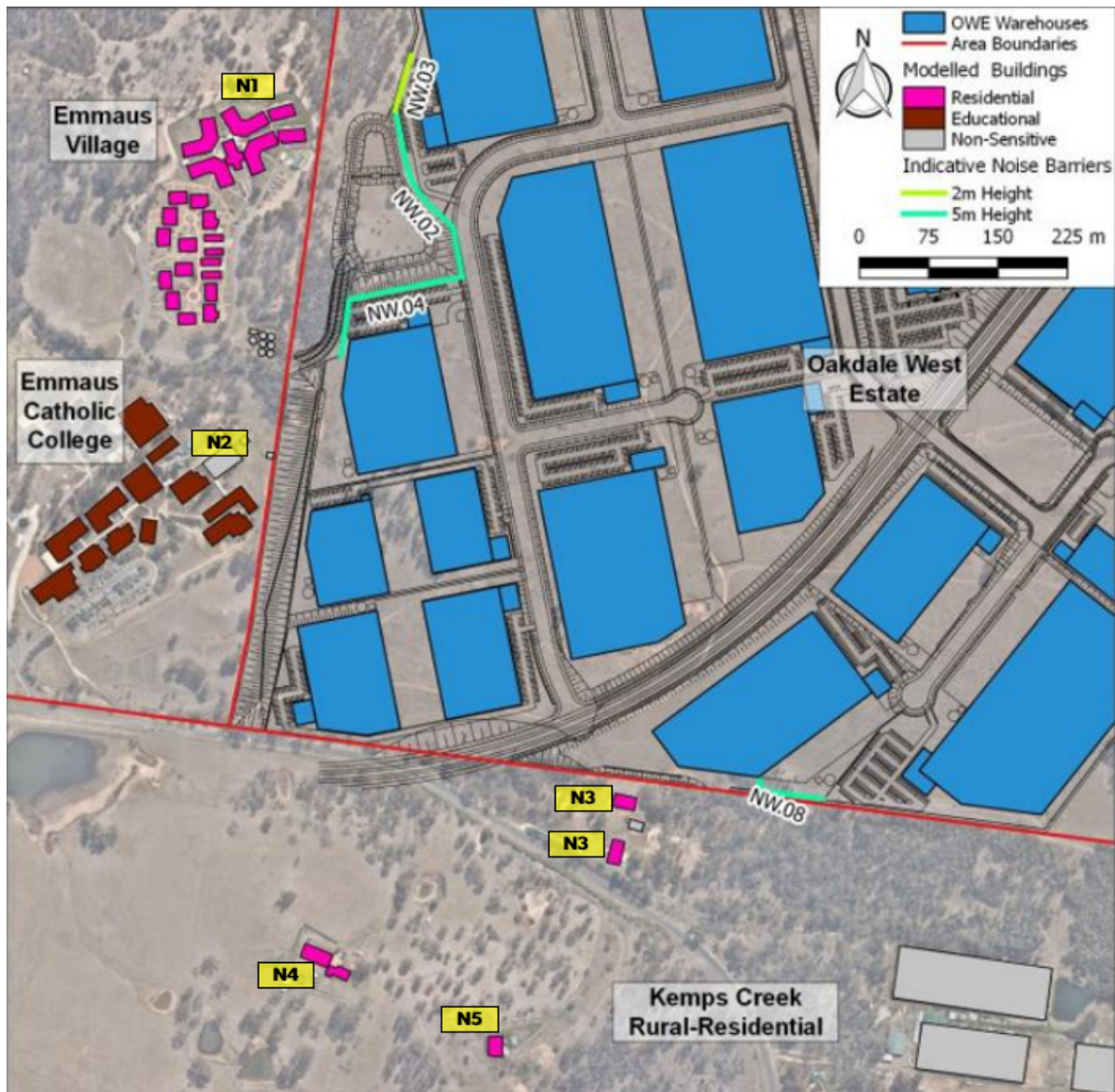


Figure 7: Sensitive Noise Receivers and Noise Wall Locations

APPENDIX 6 BIODIVERSITY

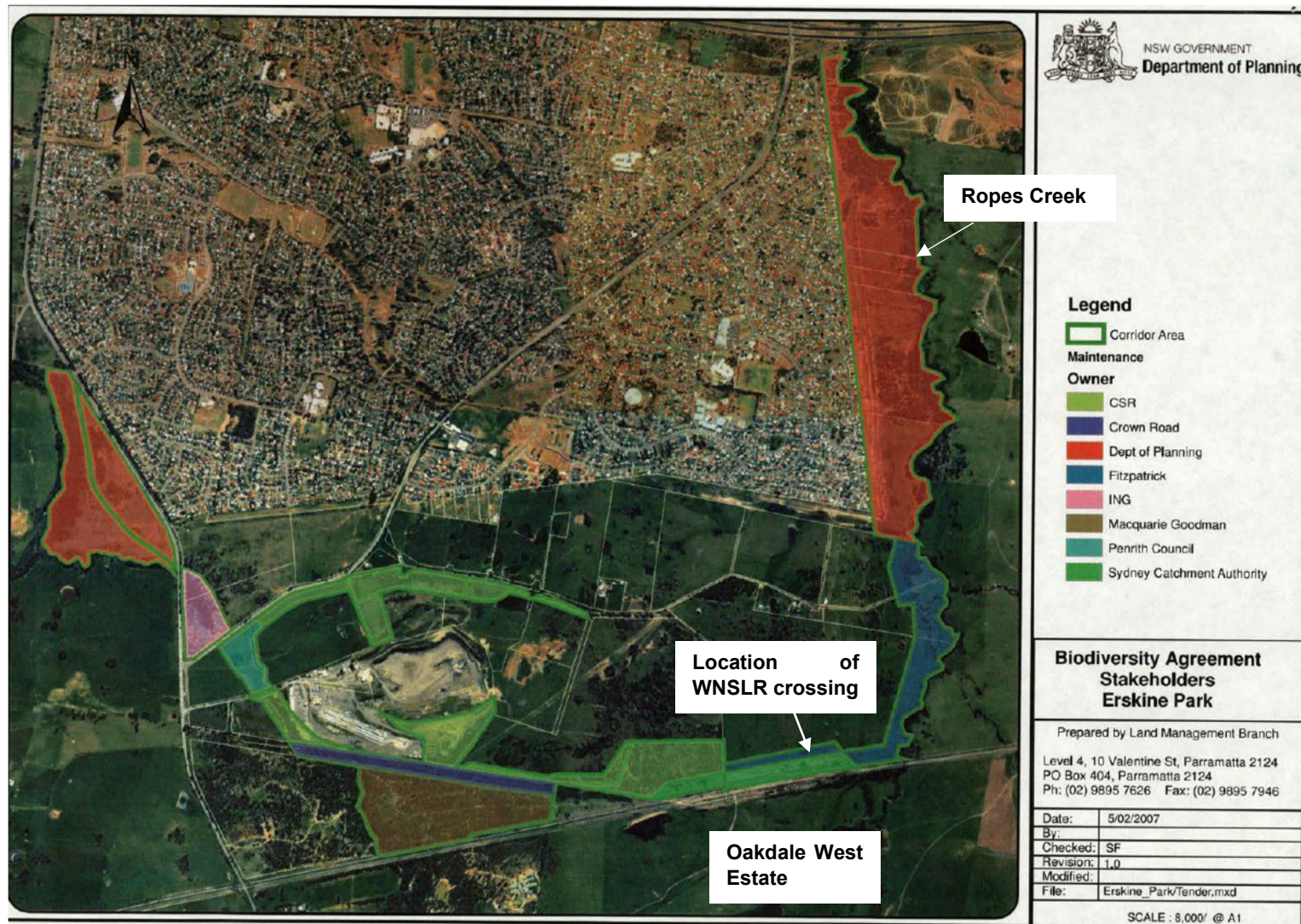


Figure 8: Erskine Park Biodiversity Corridor Land



Figure 9: Offsets for WNSLR – Planting Area

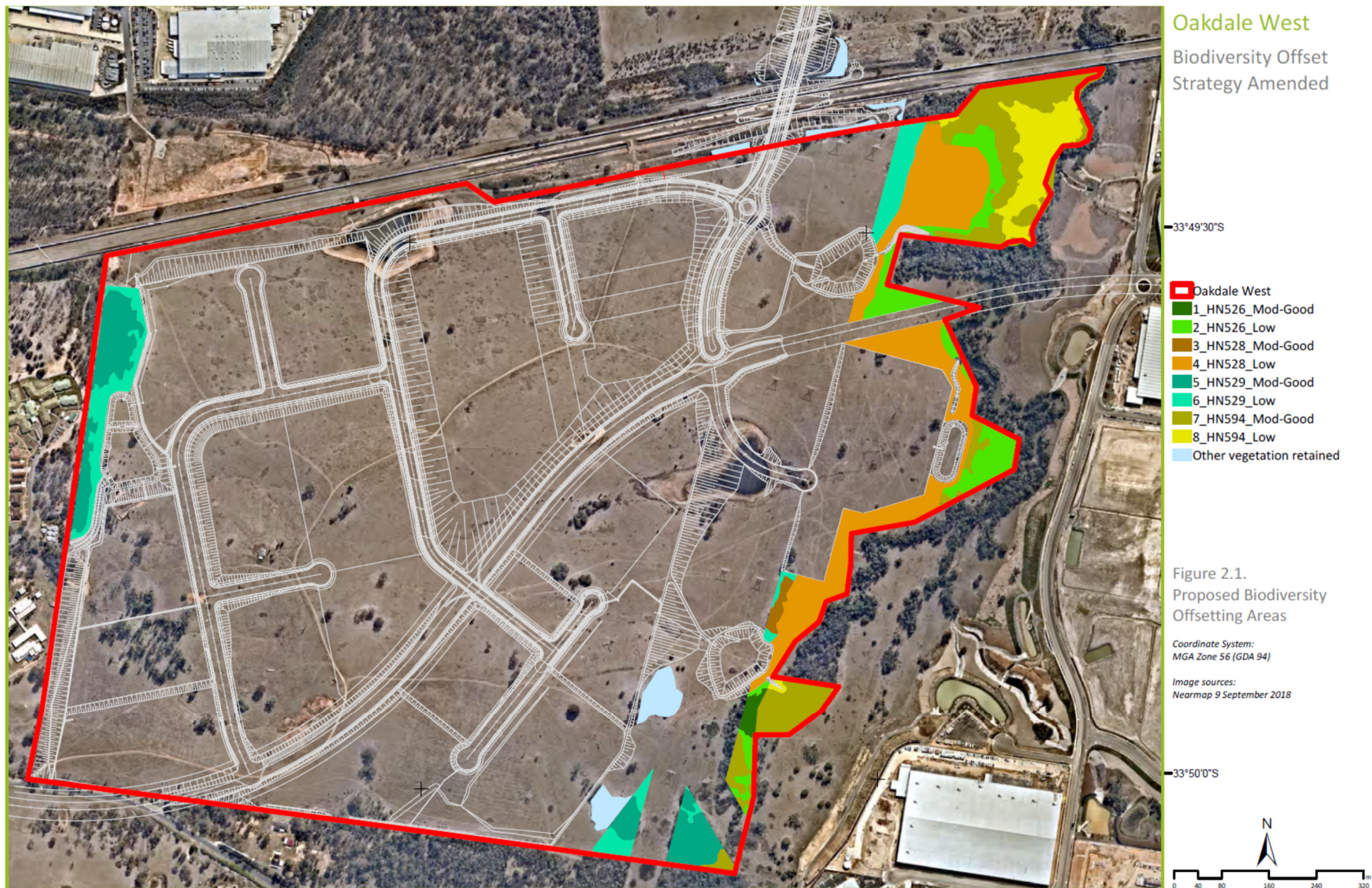


Figure 11: Offsets for Stage 1 - Biodiversity Offset Area

SUMMARY OF MITIGATION MEASURES

The collective measures required to mitigate the impacts associated with the proposed works are detailed in the table below.

Table 8: Applicant's Mitigation Measures

Issue	SSDA Component	Mitigation and Management
Construction Management		
General Construction Management	Stage 1 Development	<ul style="list-style-type: none"> A CEMP to be prepared for the OWE Stage 1 Development capturing standard and specific management and mitigation measures as described in the SSDA, EIS and supporting technical documents.
Operational Management		
General Operational Management	Concept Proposal Stage 1 Precinct Development	<ul style="list-style-type: none"> An OEMP to be prepared for the OWE capturing standard and specific operational management and mitigation measures as described in the SSDA, EIS and supporting technical documents.
Transport		
Construction Traffic	Stage 1 Development	<ul style="list-style-type: none"> Preparation of a CTMP to form part of the CEMP addressing issues such as: <ul style="list-style-type: none"> Truck haul routes, delivery schedules and curfews; Protocols for the management of construction traffic moving onto and off the site.
Urban Design and Visual		
Site Layout and Design	Concept Proposal	<ul style="list-style-type: none"> Future development of the OWE to proceed in accordance with the approved Development Concept Proposal and DCP.
Development Controls	Concept Proposal	<ul style="list-style-type: none"> Design and development controls to be established for the OWE in the form of a DCP to guide future development on the site.
Visual Impact	Concept Proposal/Stage 1 Development	<ul style="list-style-type: none"> Design and development controls to be established for the OWE in the form of a DCP to guide future development on the site. Landscaping of key interfaces including the western boundary to minimise visual impact.
Soils and Water		
Water Usage	Stage 1 Development	<ul style="list-style-type: none"> Rainwater tanks to be provided for each development site with size determined in accordance with Penrith Council DCP requirements. Irrigation and toilet flushing for development to be plumbed to rainwater tanks. Consideration to be given to other possible rainwater reuse opportunities such as for truck washing. Measures and considerations for the minimisation of water use during construction and operation to be incorporated into CEMP and OEMP as relevant.

Issue	SSDA Component	Mitigation and Management
Soils	Stage 1 Development	<ul style="list-style-type: none"> • Mitigation measures inherent to the civil design of the proposal. • Sedimentation and erosion control measures are proposed as detailed in the Civil Design and Infrastructure Package and Traffic and Transport Impact Assessment.
Salinity	Stage 1 Development	<ul style="list-style-type: none"> • A Salinity Management Plan has been prepared for the proposed development. • Management measures described in the Salinity Management Plan to be adopted in the CEMP and OEMP as relevant.
Contamination	Stage 1 Development	<ul style="list-style-type: none"> • Identified areas of potential contamination to be subject to further investigation prior to the development of affected land.
Earthworks	Stage 1 Development	<ul style="list-style-type: none"> • Civil design achieves appropriate site levels with minimal impact upon hydrology. • Import of fill to be managed in accordance with CEMP. • Erosion and sediment controls included in the SSDA package.
Mineral Resources	Concept Proposal	<ul style="list-style-type: none"> • No mitigation required provided that mining activities under the existing mining lease applying to land to the east of the site (ref. ML1636) would not be constrained by the OWE development.
Surface Water	Stage 1 Development	<ul style="list-style-type: none"> • Stormwater issues addressed through design measures incorporated into proposed development. • Stormwater management system designed to meet the requirements of Penrith Council's Engineering Works and WSUD guidelines and relevant NOW guidelines. • Detailed on-lot stormwater for future stages of the OWE to be designed and assessed under future applications.
Groundwater	Stage 1 Development	<ul style="list-style-type: none"> • Methods and management of any required dewatering required during construction works to be detailed in the CEMP.
Flooding	Stage 1 Development	<ul style="list-style-type: none"> • OSD designed to ensure that development does not increase stormwater peak flows in downstream areas for events up to and including 1:100-year ARI. • OSD designed to mitigate post-development flows to pre-development flows for peak ARI events. • Finished floor levels to have minimum 500mm freeboard to 100-year overland flows. • Flood impacts on TransGrid easement would be mitigated through minor compensatory earthworks on the floodplain to convey locally diverted flows. These works are detailed in the civil drawings included in the SSDA package.
Water Quality	Stage 1 Development	<ul style="list-style-type: none"> • Erosion and sediment controls as detailed in SSDA package to be implemented through CEMP. • Stormwater to be treated to compliant levels prior to discharge. • Gross Pollutant Trap (GPT) to be installed within each development site on the final downstream stormwater pit prior to discharge.

Issue	SSDA Component	Mitigation and Management
		<ul style="list-style-type: none"> • WSUD measures adopted to achieve target reductions for the OWE: <ul style="list-style-type: none"> <input type="checkbox"/> 85% Total Suspended Solids <input type="checkbox"/> 60% Total Phosphorus <input type="checkbox"/> 45% Total Nitrogen <input type="checkbox"/> 90% Gross Pollutants
Infrastructure		
Capacity and Upgrades	Concept Proposal	<ul style="list-style-type: none"> • Management of issues in respect of infrastructure capacity and upgrades is in the form of design responses described in Section 4.0 of the EIS.
Delivery and Staging	Concept Proposal/Stage 1 Development	<ul style="list-style-type: none"> • Management of issues in respect of infrastructure capacity and upgrades is in the form of design responses described in Section 4.0 of the EIS. • Staging of development of the OWE would be aligned with infrastructure and services delivery.
TransGrid Easement	Concept Proposal/Stage 1 Development	<ul style="list-style-type: none"> • Further consultation would be undertaken with TransGrid in relation to potential impacts and required mitigation.
Other Environmental Issues		
Flora and Fauna	Concept Proposal Stage 1 Development	<ul style="list-style-type: none"> • Implementation of the Biodiversity Offset Strategy for the site. • Preparation of a Flora and Fauna Management Plan for the site to inform the CEMP and OEMP as relevant to manage potential impacts to biodiversity during construction and operation. • Retained areas of native vegetation, including the Ropes Creek riparian corridor, will be rehabilitated and/or restored and conserved in perpetuity under a Biodiversity Stewardship Agreement to be entered into with the Biodiversity Conservation Trust. • Other areas of the site including road batters, embankments and bio-retention basins will be planted with native plant species and turf species as specified in the Landscape Planting Schedule. • Ongoing maintenance and management of these areas in accordance with the provisions of both the Biodiversity Management Action Plan and Landscape Management Plan.
Waterways and Riparian Lands		<ul style="list-style-type: none"> • Restoration and ongoing management of Ropes riparian corridor to be in accordance with the Biodiversity Management Action Plan

APPENDIX 8 INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS

WRITTEN INCIDENT NOTIFICATION REQUIREMENTS

1. A written incident notification addressing the requirements set out below must be emailed to the Department at the following address: compliance@planning.nsw.gov.au within seven days after the Applicant becomes aware of an incident. Notification is required to be given under this condition even if the Applicant fails to give the notification required under Condition D135 or, having given such notification, subsequently forms the view that an incident has not occurred.
2. Written notification of an incident must:
 - a. identify the development and application number;
 - b. provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);
 - c. identify how the incident was detected;
 - d. identify when the Applicant became aware of the incident;
 - e. identify any actual or potential non-compliance with conditions of consent;
 - f. describe what immediate steps were taken in relation to the incident;
 - g. identify further action(s) that will be taken in relation to the incident; and
 - h. identify a project contact for further communication regarding the incident.

INCIDENT REPORT REQUIREMENTS

3. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, the Applicant must provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.
4. The Incident Report must include:
 - a. a summary of the incident;
 - b. outcomes of an incident investigation, including identification of the cause of the incident;
 - c. details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and
 - d. details of any communication with other stakeholders regarding the incident.

APPENDIX B

Consultation Schedule for TfNSW (former RMS) and Water NSW

Consultation Schedules for Conditions Below

Consultation

D57. The Applicant must develop a schedule for consultation with and approval by TfNSW for the construction of the bridge foundations over the future WSFL, including geotechnical and structural certification as required by TfNSW. The schedule must form part of the CEMP required by Condition D119.

D58. The Applicant must develop a schedule for consultation with and approval by WNSW for the construction of the bridge over the water pipelines corridor. This schedule must form part of the CEMP required by Condition D119.

WNSLR Schedule for Consultation (TfNSW):

Timing	Trigger	Consultation Details
Preconstruction	Endorsement of design drawings, geotechnical engineering and consultation schedule	Meetings and document sharing and modifications until TfNSW and Goodman are satisfied.
During WNSLR Construction	If unexpected ground conditions are found for piling works requiring design changes to diameter or location of piles, columns or abutment B. Depth of foundations will vary and is not considered to trigger further consultation.	Provide Geotechnical results and design changes to TfNSW representative. Meeting to discuss if required.
Project CEMP's	Not Triggered	TfNSW require no consultation for development or implementation of site CEMP's
WNSLR Completion	After practical completion is achieved.	TfNSW to be sent as built information and certification to close out consultation.

WNSLR Schedule for Consultation (Water NSW):

Timing	Trigger	Consultation Details
Preconstruction	Endorsement of design drawings, construction methodology, Site Extent Setout, CEMP and Consultation Schedule	Meetings and document sharing and modifications until Water NSW and Goodman are satisfied.
Prior to Entering Corridor	When Structural Inspection and Dilapidation Reports are complete	Provide information to Water NSW and discuss any items requiring
During WNSLR Construction	If any noteworthy design or methodology changes are required to complete works within the Water NSW Corridor.	Contact Water NSW representative for consultation and meeting if / as required.
During WNSLR Construction	If any incidents occur that affect or could affect the water pipelines.	Contact Water NSW 24 hour Incident Notification Number 1800 061 069
WNSLR CEMP	If any updates are required to WNSLR CEMP once approved.	Contact Water NSW representative for consultation discussion, provide draft update for review and schedule meeting if / as required.
WNSLR Completion	After practical completion is achieved.	Water NSW to be sent as built information and certification to close out consultation.

APPENDIX C

Evidence of Consultation for CEMP

Consultation

Council

From: Stephen Masters <stephen.masters@penrith.city>
Sent: Thursday, 3 October 2019 6:31 PM
To: Alex Lohrisch
Subject: Council approval of Western North South Link Road Construction Environmental Management Plan SSD 7348 including all relevant subplans

Good Afternoon Alex,

I have reviewed the Western North South Link Road Construction Environmental Management Plan SSD 7348 prepared by SLR, reference 610.17948-R01, version -v1.0 dated 26 September 2019 including all subplans of the Construction Environmental Management Plan (CEMP) as listed in the appendices below:

APPENDICES

Appendix A	Development Consent SSD 7348
Appendix B	Consultation Schedule for TfNSW (former RMS) and Water NSW
Appendix C	Evidence of Consultation for CEMP
Appendix D	Environmental Management Policy
Appendix E	SSD 7348 Relevant Consent Conditions
Appendix F	G36 Requirements
Appendix G	Incident Event Report
Appendix H	Complaint Enquiry Form
Appendix I	Community Communication Strategy (SLR)
Appendix J	Construction Noise and Vibration Management Plan (SLR)
Appendix K	Construction Air Quality Management Plan (SLR)
Appendix L	Construction Traffic Management Plan (Ason)
Appendix M	Soil and Water Management Plan (Robson)
Appendix N	Salinity Management Plan (Pells Sullivan Meynink)
Appendix O	Fill Importation Protocol (AECOM)
Appendix P	Waste Management Plan (SLR)
Appendix Q	Landscape Management Plan (Scape Design)
Appendix R	Flora and Fauna Management Plan (Ecologique)
Appendix S	Unexpected Finds Protocol – Archaeological Items (Artefact)
Appendix T	Unexpected Finds Protocol – Contamination (AECOM)
Appendix U	Bushfire Protection Assessment (ABPP)

I can advise that the Western North South Link Road CEMP, including all relevant subplans as required by the consent conditions, are acceptable to Council.

As discussed, you are advised to undertake a dilapidation survey of existing pavement condition of both Bakers Lane and Aldington Road out to their intersections with Mamre Road prior to the commencement of construction works. The Construction Traffic Management Plan (CTMP) Section 3.1.2 states that up to 696 truck movements per day are associated with inbound and outbound deliveries. Any damage to Council's local road network as a result of the truck movements will be required to be rectified by Goodman. You are to ensure all construction traffic are made aware of the CTMP, particularly Section 3.1.5 Measures to Manage Construction Traffic in Bakers Lane During School Zone Hours.

I will provide advice in separate emails regarding the CEMP for Stage 1 and Council's requirements for the bridge design of the WNSLR.

I trust the above information is satisfactory, please do not hesitate to contact me if you wish to discuss any matter.

Regards

Stephen Masters
Development Engineering Coordinator

E Stephen.Masters@penrith.city
T +612 4732 7759 | F +612 4732 7958 | M +61423 781 518
PO Box 60, PENRITH NSW 2751
www.visitpenrith.com.au
www.penrithcity.nsw.gov.au

PENRITH
CITY COUNCIL



RMS (now TfNSW)

From: Pahee Rathan <Pahee.RATHAN@rms.nsw.gov.au>
Sent: Thursday, 8 August 2019 7:48 AM
To: Alex Lohrisch <Alex.L@atl.net.au>
Cc: Anthony McLandsborough <anthony.m@atl.net.au>; Stephanie Partridge <Stephanie.Partridge@goodman.com>; Kym Dracopoulos <Kym.Dracopoulos@goodman.com>; Luke Ridley <Luke.Ridley@goodman.com>; Dane Segail <Dane.S@atl.net.au>
Subject: RE: Oakdale West - WNSLR CEMP Consultation SSDA7348

Good Morning Alex,

I refer to your email regarding draft CEMP for construction of Western north South Link Road.

Roads and Maritime has reviewed the draft and provides the following comments:

The proposed access of Mamre Road (Central Access) is not supported on road safety ground. Roads and Maritime has no objection to the other proposed accesses (Bakers Lane and Lenore Drive).

If you like to discuss this matter further, please call me on the numbers below.

Regards
Pahee

Pahee Rathan
Senior Land Use Assessment Coordinator
North West Precinct | Greater Sydney Division
T 02 8849 2219 M 0417 246 510
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
27 Argyle Street Parramatta NSW 2150

From: Alex Lohrisch

Sent: Monday, 12 August 2019 4:22 PM

To: Pahee Rathan <Pahee.RATHAN@rms.nsw.gov.au>

Cc: Anthony McLandsborough <anthony.m@atl.net.au>; Stephanie Partridge <Stephanie.Partridge@goodman.com>; Kym Dracopoulos <Kym.Dracopoulos@goodman.com>; Luke Ridley <Luke.Ridley@goodman.com>; Dane Segail <Dane.S@atl.net.au>

Subject: RE: Oakdale West - WNSLR CEMP Consultation SSDA7348

Hi Pahee,

We have taken on RMS advice from your email below.

While we are looking for alternatives, we know the Mamre Road Access remains critical to be able to physically undertake bridge building works over pipelines.

If accessing from Old Wallgrove Road, vehicles would have to cross a 10t load rated bridge between the access point and the work site, which is not suitable for construction traffic.

Would RMS endorse a Left In Left Out use of this access point?

Sketch attached to show adequate sight distance as well as turn path for 8m bogie tippers (12-25t) and 8.8m concrete trucks. These vehicles will form the majority of the movements for the site. Any other vehicles can be assessed in the specific plans developed for TMC approval during the construction.

You earliest advice is greatly appreciated.

Regards,

Alex Lohrisch

Senior Civil Engineer / Project Manager

From: Alex Lohrisch

Sent: Monday, 16 September 2019 2:31 PM

To: Pahee Rathan <Pahee.RATHAN@rms.nsw.gov.au>; Malgy.COMAN@rms.nsw.gov.au <Malgy.COMAN@rms.nsw.gov.au>

Cc: Anthony McLandsborough <anthony.m@atl.net.au>; Kym Dracopoulos <Kym.Dracopoulos@goodman.com>; Stephanie Partridge <Stephanie.Partridge@goodman.com>; Dane Segail <Dane.S@atl.net.au>

Subject: RE: OWE - Mamre Road Access

Hi Pahee and Malgy,

The WNSLR CTMP (attached) has been updated as discussed in the meeting last week.

I look forward to your updated response on Friday if possible. Please let me know if you have any questions.

Regards,

Alex Lohrisch

Senior Civil Engineer / Project Manager

at&I

Level 7, 153 Walker Street

North Sydney NSW 2060

P 02 9439 1777

M 0415 398 014

F 02 9923 1055

alex.l@atl.net.au

www.atl.net.au

From: Malgy Coman <Malgy.COMAN@rms.nsw.gov.au> Sent: Tue 24-Sep-2019 10:47 AM
To: Alex Lohrisch
Cc: Pahee Rathan
Subject: RE: RMS responses for Oakdale West

Hi Alex,

Reference is made to your email dated 16 September 2019 seeking Roads and Maritime Services (Roads and Maritime) comments for the updated CTMP. Roads and Maritime notes that the updated CTMP proposes a left-in/left-out arrangement for construction vehicle access on Mamre Road, and provides the following comments/requirements to be incorporated in the approval of the CTMP by the Department of Planning, Industry and Environment:

1. The proposed left-in/left-out construction vehicle arrangement on Mamre Road requires road safety mitigation works to safely accommodate simultaneous entry/egress to the satisfaction of Roads and Maritime. These works require concurrence from Roads and Maritime in accordance with Section 138 of the Roads Act, 1993 and a Works Authorisation Deed.
2. Road safety mitigation works need to adequately address Roads and Maritime concerns regarding the merge point from two lanes into one lane located close to this access point. There are concerns that drivers focusing on the merge may not notice a construction vehicle slowing down just beyond the merge, potentially resulting in a rear-end crash.
3. The current posted speed limit is 80km/hr and a design speed of 90km/hr needs to be considered in road safety mitigation works for the construction vehicle access.
4. The developer is requested to adequately address potential driver confusion for situations where construction vehicles are slowing down before the merge point whilst motorists are accelerating to merge at this location.
5. For occasional large deliveries of plant and material detailed traffic control plans need to be submitted to Roads and Maritime's Network and Safety Section for review and approval.

Roads and Maritime will provide comments for the submitted CEMP to you shortly. Please also be advised that the WAD documents for the traffic signal modifications on Lenore Drive have been handed over to our Developer Works team for review/action.

Regards,

Malgy Coman
Senior Land Use Planner (Monday, Tuesday and Thursday)
North West Precinct
T 02 8849 2413
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
27 Argyle Street Parramatta NSW 2150

Water NSW

From: Justine Clarke <Justine.Clarke@waternsw.com.au>
Sent: Tuesday, 6 August 2019 3:29 PM
To: Alex Lohrisch <Alex.L@atl.net.au>
Subject: WaterNSW response - North South Link Road CEMP and final civil & bridge plans

Dear Alex

Thank you for allowing WaterNSW the opportunity to comment on the final draft Construction Environmental Management Plan (CEMP) and final civil and bridge plans for the North South Link Road through Oakdale West.

WaterNSW have reviewed the documents and endorse the documents in line with the attached comments and recommendations. In addition, WaterNSW consider all previously discussed and agreed items at meetings, site visits or in correspondence to constitute part of this endorsement and included in the project implementation.

Please note that due to pipeline shutdown works currently underway, WaterNSW are unable to arrange for the removal of the dirt pile and concrete material located near Oakdale overpass (concrete encased track over pipeline 1). Can this removal works be incorporated into your works program when undertaking the pavement works for the concrete encased section?

If you have any questions please do not hesitate to contact me.

Regards

Justine Clarke
Catchment and Asset Protection Adviser



From: Alex Lohrisch <Alex.L@atl.net.au>
Sent: Wednesday, 14 August 2019 10:57 AM
To: Justine Clarke <Justine.Clarke@waterNSW.com.au>
Cc: Kym Dracopoulos <Kym.Dracopoulos@goodman.com.au>; Stephanie Partridge <Stephanie.Partridge@goodman.com.au>; Luke Ridley <Luke.Ridley@goodman.com.au>; Anthony McLandsborough <anthony.m@atl.net.au>; Mark Dolan <Mark.Dolan@robsoncivil.com.au>; Dane Segail <Dane.S@atl.net.au>
Subject: RE: WaterNSW response - North South Link Road CEMP and final civil & bridge plans

Hi Justine,

I provide the information in this email in specifically in response to Water NSW final comments on design of WNSLR.

Update drawings are attached and answers to questions are below:

[Do you expect the existing 450mm RC pipes will still convey water after the large cranes etc drive over them.](#) Yes. I expect the contractor to either protect the pipes sufficiently to avoid any damage or make good any damage caused by their works in line with the draft consent conditions.

[Why have the plans changed from installing one 900mm pipe back to 2 x 450s?](#) This has changed because of the new constraints advised by WaterNSW at the CEMP Site Meeting. The primary reason is the fair weather access track north of pipeline 2 that was not previously considered, where cover to 900mm pipe could not be achieved. The second reason is culverts are now required to be installed underneath pipeline 2, and it is easier/less risk to do this with smaller pipes. The final design has 4 x 450 pipes (2 existing retained and 2 new to increase capacity) as well as moving open drains as far from pipeline structures as possible.

[Please note that due to pipeline shutdown works currently underway, WaterNSW are unable to arrange for the removal of the dirt pile and concrete material located near Oakdale overpass \(concrete encased track over pipeline 1\). Can this removal works be incorporated into your works program when undertaking the pavement works for the concrete encased section?](#) The majority of the WNSW Stockpile is outside of the works area. The contractor will reshape the stockpile so it does not impact works, but not remove it from corridor. It is preferred that WNSW do not add to this pile or create new ones within the WNSLR work area during maintenance currently underway.

Would you please confirm this adequately closes out Water NSW design related comments?

Regards,

Alex Lohrisch
Senior Civil Engineer / Project Manager



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From: ☐ Justine Clarke <Justine.Clarke@waterNSW.com.au> **Sent:** Tue 03-Sep-2019 3:07 PM
To: ☐ Alex Lohrisch
Cc:
Subject: RE: WaterNSW response - North South Link Road CEMP and final civil & bridge plans

Hi Alex

Thank you for providing the below advice and updating the drawings to meet WaterNSW requirements.

I can confirm that this advice is satisfactory to WaterNSW and closes out design related comments.

Regards Justine

Justine Clarke
Catchment and Asset Protection Adviser



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North South Link Road consolidated comments on final draft CEMP and final civil drawings

5 August 2019

Additions to CEMP

Items agreed for inclusion in CEMP (but not yet included due to timing)

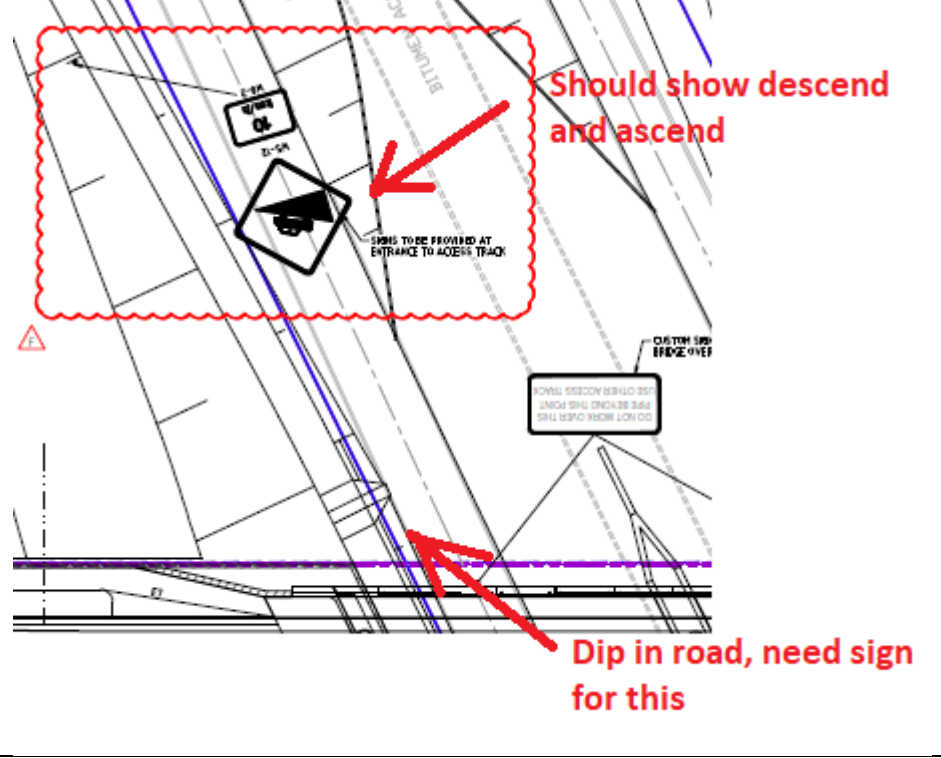
Item	Notes/ comments
Works as executed plans for bridge	To be provided by AT&L on completion
Bridge Operation and Maintenance Manual (O&M)	To be provided by AT&L on completion
Condensation dripping from the underside of bridge onto pipeline	Inspection to occur when bridge deck installed to confirm if condensation is forming. The if required mitigation measures will be developed.
Vibration controls during cutting out of South east batter rock	Environmental management controls to be included in CNVMP for cutting out rock on the batters.
Retained Soil Wall (RSW) sacrificial steel straps - Sacrificial straps within retained soil wall so that they can be removed and inspected during monitoring of the bridge structure (by the asset owner) to determine corrosion rates.	<ul style="list-style-type: none">• WaterNSW request to view to shop drawings for the sacrificial steel straps to confirm advised steel thickness has been adopted.• WaterNSW agree that sacrificial anodes are not required at this site.• WaterNSW are still not clear if trigger limits and rectification actions will be undertaken if the steel straps corrode quicker than expected. AT&L's response on 12/07/2019 does not answer our initial question (09/07/19). Given RMS R57 & 58 specifications set out the maximum chemical contents permitted in the fill (regardless if imported or insitu) what is meant by "Monitoring requirements are determined considering validation of in-situ soils as well as imported backfill materials". WaterNSW request a clearer description of the monitoring program for the RSW, including remediation actions that will be undertaken.
Surveillance cameras	If installed signage to be erected.
Dial before you dig (DBYD) check	Complete a DBYD prior to removal of the old redundant comms line
Pipeline infrastructure protection measures	WNSW pipeline protection measures to be utilised where required.

Changes required to CEMP (v3, July 2019)

Item	Notes/ comments
Construction Environmental Management Plan	<ul style="list-style-type: none"> Noxious Weeds Act superseded by the Biosecurity Act 2015 (pg 57)
Construction Traffic Management Plan (appendix L)	<ul style="list-style-type: none"> Sect 3.1.3 – change the legend on figure 10 from truck route to light vehicle route – commentary to include wording on; <ul style="list-style-type: none"> light vehicle use only for the access track under pipeline (2.8m clearance) and over encasement. reinstatement if any damage occurs retention of any gates temporarily removed Figure 12 – remove the truck route under the Pipelines WaterNSW request to see the Traffic Control Plan (TCP) for Mamre Rd entry to Pipeline corridor.
Soil and Water Management Plan (appendix M)	<ul style="list-style-type: none"> Staging Plans refer to the pipeline corridor as Sydney Water Pipeline – ensure Pipelines corridor or Pipelines are referred to as 'Warragamba to Prospect Pipelines'.

Changes required to final civil drawings (26.07.19) & General Bridge Plans (08.07.19)

Item	Notes/ comments
Civil drg 15-272-C5010	<ul style="list-style-type: none"> Drawing C5010 has typical access tracks for the retaining walls which are sharp sloped, we request a rounded shape on the higher catch drains to maintain a clear path from vegetation (see attached image). WaterNSW have a guidelines manual for good practice for unsealed roads and it is better to have the catch drains rounded for clearing of vegetation with a mower rather than angled so we can mow closer to the bottom of the drain.
Civil drg 15-272-C5016	Concrete Apron <ul style="list-style-type: none"> The concrete apron detail should state some compaction of the DGB20 subbase. The dwg should specify a strength of 25 not 20 MPa concrete.
Civil drg 15-272-C5118	<ul style="list-style-type: none"> Shows along the WNSW access track some signs with vehicle traveling up hill, this is incorrect, the vehicle will be travelling downhill and the signs should be amended to show a descend not ascend. Shows a concrete apron - there should be a sign showing dip in road.

	
<p>Civil drg 15-272-C5062</p>	<p>Drainage upgrade works & roadway refurbishments</p> <ul style="list-style-type: none"> • WaterNSW have no concerns with the use of HDPE stormwater pipes being used. • For reference, find attached WaterNSW general specifications for concrete works (Domestic and Commercial Concrete Paving) to be considered for the access road refurbishment. • WaterNSW use 'Warragamba' concrete for all of our concrete works. • WaterNSW request to view the final technical specifications or/ and drawings or/ and methodology for the road refurbishment works. As per draft consent condition D31. • To ensure a maintenance path is maintained for access behind pipeline 2, a minimum 3m distance from the pipeline to the head wall should be specified on the plan. <p>Questions</p> <ul style="list-style-type: none"> • Do you expect the existing 450mm RC pipes will still convey water after the large cranes etc drive over them. • Why have the plans changed from installing one 900mm pipe back to 2 x 450s?

15 October 2019

Endeavour Energy Ref: UIS0845 – 2018/01427/001
Customer Ref:

Connect Infrastructure
PO Box 484
CASULA MALL NSW 2170

Attention: Brendon Hince

Dear Sir/Madam

**UIS0845 – Land Subdivision Application: LOT 2,3,11,2,6, DP
84578,85393,1178389,1215268,229784, Lenore Drive, KEMPS CREEK**

Drawing Number: 513625A 513624A

Endeavour Energy has reviewed and certified your design package. Please find the certified drawing 513625A 513624A attached.

The certification of this project is supported by the following key documents:

Document name	Notation Date
Summary Environmental Report (SER) – FAT0038	19/ 09/ 2019
Design Safety Report	24/ 06/ 2019

This certification is valid for six months from the date of issue and is conditional on the network remaining unchanged. Amendments to the design may need to be arranged by the Developer if the network conditions change prior to the works being completed.

Please note that the network is subject to change at any time. Endeavour Energy accepts no responsibility for any changes to the certified design that may be required.

Endeavour Energy will provide advice regarding Ancillary Network Services Fees applicable to the construction phase of the project following the nomination of the Level 1 Accredited Service Provider (ASP).

Please complete and return the attached Notice of Intent form that must be signed by the ASP3, the Developer and the nominated ASP1.

Should you have any enquiries regarding your application please contact the undersigned.
Yours faithfully,

Vishal Chavan
Contestable Works Engineer
Ph: 02 9853 7923
Fax: 9853 7925
Email: cwtech@endeavourenergy.com.au

15 October 2019

Endeavour Energy Ref: UIS0845

Drawing Number: **513625A** 513624A

Endeavour Energy
PO Box 811
Seven Hills NSW 1730

**LETTER OF INTENT – ELECTRICITY SUPPLY OF LOT 2,3,11,2,6, DP
84578,85393,1178389,1215268,229784, Lenore Drive, KEMPS CREEK**

The Level 3 Accredited Service Provider (ASP) for this project to complete the following.

I declare that I am the rightful owner of the Intellectual property of the design for this project. I agree to release the design to the Developer Representative for construction and Endeavour Energy for their network records.

Name / Company:

Signature:

Date:

Email:

Phone:

The Developer and the Constructor Representatives to complete the following and return to Endeavour Energy.

Please accept this letter as notification that I intend to proceed with the development referenced above.

I own or am developing the land and will undertake works associated with the electrical network. I intend to carry out all works and transfer this work to Endeavour Energy in accordance with Endeavour Energy's requirements outlined in the Terms and Conditions of Endeavour Energy's Model Standing Offer for a Standard Connection Service.

I shall nominate **ONE ONLY** Level 1 ASP responsible for this CAP project. This Level 1 ASP will be prepared to accept all warranty maintenance, insurances and defect liability for this CAP project.

I acknowledge that Endeavour Energy will only issue the letter of acceptance to accept the assets when all of the works associated with this project and the necessary forms, declarations & WAE drawings have been completed and finalised and all Ancillary Network Services Fees and outstanding charges including Street Lighting Tariff Class 5 have been paid to Endeavour Energy.

A The Trenching works will be carried out by:

Name / Company:

Address:

Email: **Phone:**

Proposed start date: **Proposed End date:**

B The Electrical works will be carried out by:

Name / Company:

Address:

Email: **Phone:**

Proposed start date: **Proposed End date:**

C The Warranty and Maintenance Retention Security will be provided by the following single party:

Name / Company:

Address:

Email: **Phone:**

D The total value of this project excluding GST is \$

E The Fees will be paid to Endeavour Energy by the following single party:

Name / Company:

Address:

Email: **Phone:**

F The charge for the use of Endeavour Energy Duct if applicable will be paid by the following single party:

Name / Company:

Address:

Email: **Phone:**

G The payment advice for the Streetlight Tariff Class 5 charge, if included in the certified design package has been paid (please circle): Yes / No / NA

If No, please provide reason:

.....

H The Reimbursement if applicable is payable to the following single party following the letter of acceptance and receipt of invoice:

Name / Company:

Address:

Email: Phone:

I Acknowledgment of works responsibilities:

I,, being the foreman, project manager or superintendent for the Level 1 ASP (constructor), have been issued with and understand the Environmental Management Plan and undertake to comply with its requirements.

I have briefed all personnel, contractors and sub-contractors about the objectives and contents of the Environmental Management Plan and the works to be undertaken.

I am also aware of requirements as detailed in design drawings and other supporting documents associated with the certified design.

I have attached the approved DA from the local Council to this form (if it has not previously been provided)

We, the undersigned, warrant that the information provided above is correct and we are authorised to execute this agreement on behalf of our respective organisation.

Developer Representative

Level 1 ASP Representative

Company:

Company:

Name:

Name:

Email:

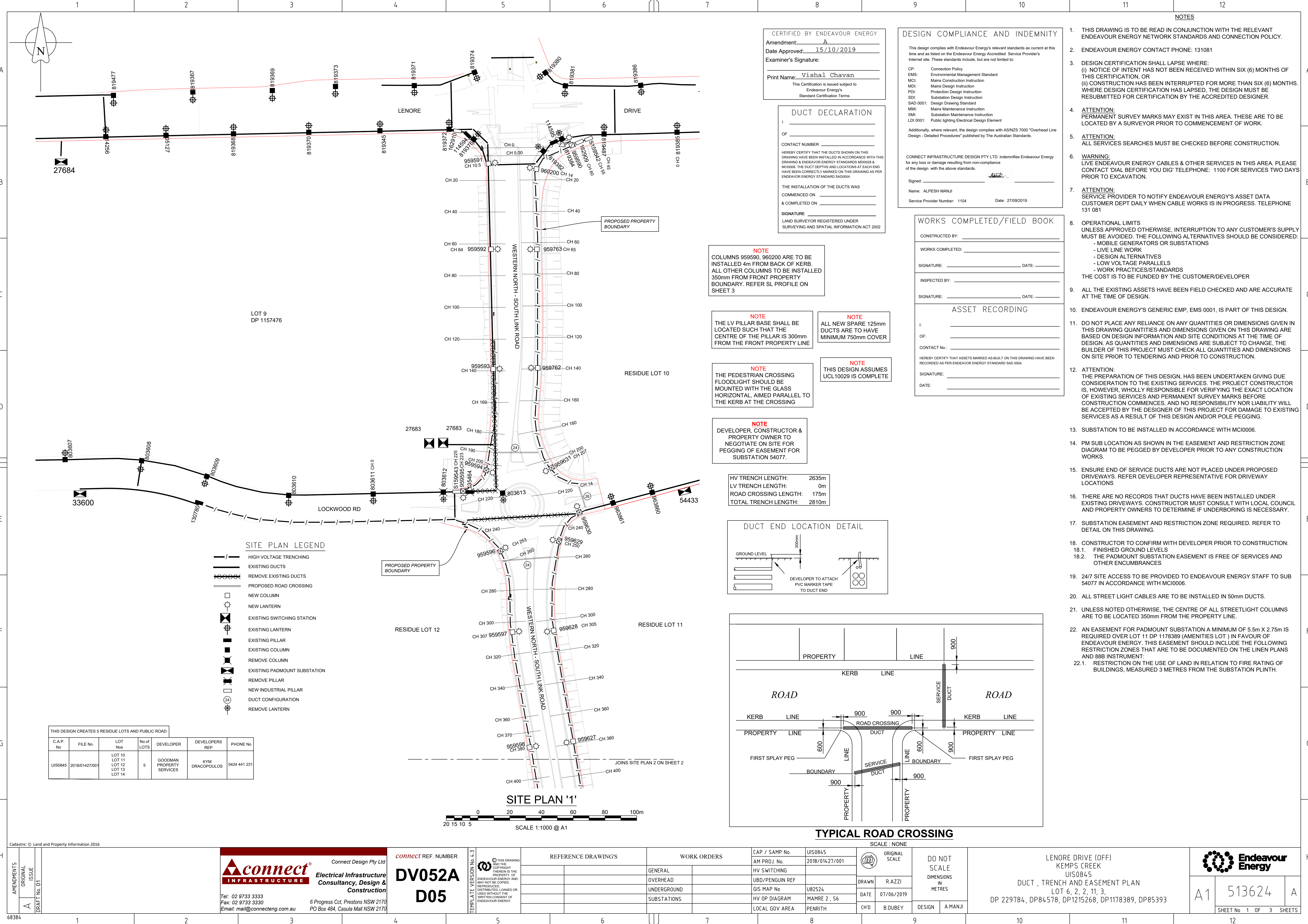
Email:

Phone:

Phone:

..... Date:
(Signature)

..... Date:
(Signature)



NOTES											
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT ENDEAVOUR ENERGY NETWORK STANDARDS AND CONNECTION POLICY.											
2. ENDEAVOUR ENERGY CONTACT PHONE: 131081											
3. DESIGN CERTIFICATION SHALL LAPSE WHERE: (i) NOTICE OF INTENT HAS NOT BEEN RECEIVED WITHIN SIX (6) MONTHS OF THIS CERTIFICATION, OR (ii) CONSTRUCTION HAS BEEN INTERRUPTED FOR MORE THAN SIX (6) MONTHS. WHERE DESIGN CERTIFICATION HAS LAPSED, THE DESIGN MUST BE RESUBMITTED FOR CERTIFICATION BY THE ACCREDITED DESIGNER.											
4. ATTENTION: PERMANENT SURVEY MARKS MAY EXIST IN THIS AREA. THESE ARE TO BE LOCATED BY A SURVEYOR PRIOR TO COMMENCEMENT OF WORK.											
5. ATTENTION: ALL SERVICES SEARCHES MUST BE CHECKED BEFORE CONSTRUCTION.											
6. WARNING: LIVE ENDEAVOUR ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT 'DIAL BEFORE YOU DIG' TELEPHONE: 1100 FOR SERVICES TWO DAYS PRIOR TO EXCAVATION.											
7. ATTENTION: SERVICE PROVIDER TO NOTIFY ENDEAVOUR ENERGY'S ASSET DATA CUSTOMER DEPT DAILY WHEN CABLE WORKS IS IN PROGRESS. TELEPHONE 131 081											
8. OPERATIONAL LIMITS UNLESS APPROVED OTHERWISE, INTERRUPTION TO ANY CUSTOMER'S SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED: - MOBILE GENERATORS OR SUBSTATIONS - LIVE LINE WORK - DESIGN ALTERNATIVES - LOW VOLTAGE PARALLELS - WORK PRACTICES/STANDARDS THE COST IS TO BE FUNDED BY THE CUSTOMER/DEVELOPER											
9. ALL THE EXISTING ASSETS HAVE BEEN FIELD CHECKED AND ARE ACCURATE AT THE TIME OF DESIGN.											
10. ENDEAVOUR ENERGY'S GENERIC EMP, EMS 0001, IS PART OF THIS DESIGN.											
11. DO NOT PLACE ANY RELIANCE ON ANY QUANTITIES OR DIMENSIONS GIVEN IN THIS DRAWING QUANTITIES AND DIMENSIONS GIVEN ON THIS DRAWING ARE BASED ON DESIGN INFORMATION AND SITE CONDITIONS AT THE TIME OF DESIGN. AS QUANTITIES AND DIMENSIONS ARE SUBJECT TO CHANGE, THE BUILDER OF THIS PROJECT MUST CHECK ALL QUANTITIES AND DIMENSIONS ON SITE PRIOR TO TENDERING AND PRIOR TO CONSTRUCTION.											
12. ATTENTION: THE PREPARATION OF THIS DESIGN, HAS BEEN UNDERTAKEN GIVING DUE CONSIDERATION TO THE EXISTING SERVICES. THE PROJECT CONSTRUCTOR IS, HOWEVER, WHOLLY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF EXISTING SERVICES AND PERMANENT SURVEY MARKS BEFORE CONSTRUCTION COMMENCES, AND NO RESPONSIBILITY NOR LIABILITY WILL BE ACCEPTED BY THE DESIGNER OF THIS PROJECT FOR DAMAGE TO EXISTING SERVICES AS A RESULT OF THIS DESIGN AND/OR POLE PEGGING.											
13. SUBSTATION TO BE INSTALLED IN ACCORDANCE WITH MCI0006.											
14. PM SUB LOCATION AS SHOWN IN THE EASEMENT AND RESTRICTION ZONE DIAGRAM TO BE PEGGED BY DEVELOPER PRIOR TO ANY CONSTRUCTION WORKS.											
15. ENSURE END OF SERVICE DUCTS ARE NOT PLACED UNDER PROPOSED DRIVEWAYS. REFER DEVELOPER REPRESENTATIVE FOR DRIVEWAY LOCATIONS											
16. THERE ARE NO RECORDS THAT DUCTS HAVE BEEN INSTALLED UNDER EXISTING DRIVEWAYS. CONSTRUCTOR MUST CONSULT WITH LOCAL COUNCIL AND PROPERTY OWNERS TO DETERMINE IF UNDERBORING IS NECESSARY.											
17. SUBSTATION EASEMENT AND RESTRICTION ZONE REQUIRED. REFER TO DETAIL ON THIS DRAWING.											
18. CONSTRUCTOR TO CONFIRM WITH DEVELOPER PRIOR TO CONSTRUCTION: 18.1. FINISHED GROUND LEVELS 18.2. THE PADMOUNT SUBSTATION EASEMENT IS FREE OF SERVICES AND OTHER ENCUMBRANCES											
19. 24/7 SITE ACCESS TO BE PROVIDED TO ENDEAVOUR ENERGY STAFF TO SUB 54077 IN ACCORDANCE WITH MCI0006.											
20. ALL STREET LIGHT CABLES ARE TO BE INSTALLED IN 50mm DUCTS.											
21. UNLESS NOTED OTHERWISE, THE CENTRE OF ALL STREETLIGHT COLUMNS ARE TO BE LOCATED 350mm FROM THE PROPERTY LINE.											
22. AN EASEMENT FOR PADMOUNT SUBSTATION A MINIMUM OF 5.5m X 2.75m IS REQUIRED OVER LOT 11 DP 1178389 (AMENITIES LOT) IN FAVOUR OF ENDEAVOUR ENERGY. THIS EASEMENT SHOULD INCLUDE THE FOLLOWING RESTRICTION ZONES THAT ARE TO BE DOCUMENTED ON THE LINEN PLANS AND 88B INSTRUMENT: 22.1. RESTRICTION ON THE USE OF LAND IN RELATION TO FIRE RATING OF BUILDINGS, MEASURED 3 METRES FROM THE SUBSTATION PLINTH.											

CERTIFIED BY ENDEAVOUR ENERGY

Amendment: A

Date Approved: 15/10/2019

Examiner's Signature:

Print Name: Vishal Chavan

This Certification is issued subject to Endeavour Energy's Standard Certification Terms

DUCT DECLARATION

I

OF

CONTACT NUMBER

HEREBY CERTIFY THAT THE DUCTS SHOWN ON THIS DRAWING HAVE BEEN INSTALLED IN ACCORDANCE WITH THIS DRAWING & ENDEAVOR ENERGY STANDARDS M00028 & M00036. THE DUCT DEPTHS AND LOCATIONS AT EACH END HAVE BEEN CORRECTLY MARKED ON THIS DRAWING AS PER ENDEAVOR ENERGY STANDARD SAD0004.

THE INSTALLATION OF THE DUCTS WAS COMMENCED ON

& COMPLETED ON

SIGNATURE

LAND SURVEYOR REGISTERED UNDER SURVEYING AND SPATIAL INFORMATION ACT 2002

DESIGN COMPLIANCE AND INDEMNITY

This design complies with Endeavour Energy's relevant standards as current at this time and as listed on the Endeavour Energy Accredited Service Provider's Internet site. These standards include, but are not limited to:

CP: Connection Policy

EMS: Environmental Management Standard

MCI: Mains Construction Instruction

MDI: Mains Design Instruction

PDI: Protection Design Instruction

SDI: Substation Design Instruction

SAD 0001: Design Drawing Standard

MMI: Mains Maintenance Instruction

SMI: Substation Maintenance Instruction

LDI 0001: Public Lighting Electrical Design Element

Additionally, where relevant, the design complies with AS/NZS 7000 "Overhead Line Design - Detailed Procedures" published by The Australian Standards.

CONNECT INFRASTRUCTURE DESIGN PTY LTD indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design with the above standards.

Signed: ALPESH MANJI

Service Provider Number: 1104

Date: 27/09/2019

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY:

WORKS COMPLETED:

SIGNATURE: DATE:

INSPECTED BY:

SIGNATURE: DATE:

ASSET RECORDING

I:

OF:

CONTACT No.:

HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOR ENERGY STANDARD SAD 0004.

SIGNATURE:

DATE:

NOTE

COLUMNS 959590, 960200 ARE TO BE INSTALLED 4m FROM BACK OF KERB. ALL OTHER COLUMNS TO BE INSTALLED 350mm FROM FRONT PROPERTY BOUNDARY. REFER SL PROFILE ON SHEET 3

NOTE

THE LV PILLAR BASE SHALL BE LOCATED SUCH THAT THE CENTRE OF THE PILLAR IS 300mm FROM THE FRONT PROPERTY LINE

NOTE

ALL NEW SPARE 125mm DUCTS ARE TO HAVE MINIMUM 750mm COVER

NOTE

THIS DESIGN ASSUMES UCL10029 IS COMPLETE

NOTE

THE PEDESTRIAN CROSSING FLOODLIGHT SHOULD BE MOUNTED WITH THE GLASS HORIZONTAL, AIMED PARALLEL TO THE KERB AT THE CROSSING

NOTE

DEVELOPER, CONSTRUCTOR & PROPERTY OWNER TO NEGOTIATE ON SITE FOR PEGGING OF EASEMENT FOR SUBSTATION 54077.

HV TRENCH LENGTH: 2635m

LV TRENCH LENGTH: 0m

ROAD CROSSING LENGTH: 175m

TOTAL TRENCH LENGTH: 2810m

DUCT END LOCATION DETAIL

GROUND LEVEL

300mm

DEVELOPER TO ATTACH PVC MARKER TAPE TO DUCT END

THIS DESIGN CREATES 5 RESIDUE LOTS AND PUBLIC ROAD

C.A.P. No	FILE No	LOT Nos	No. of LOTS	DEVELOPER	DEVELOPERS REP	PHONE No
UIS0845	2018/01427/001	LOT 10 LOT 11 LOT 12 LOT 13 LOT 14	5	GOODMAN PROPERTY SERVICES	KYM DRACPOULOS	0424 441 231

SITE PLAN LEGEND

HIGH VOLTAGE TRENCHING

EXISTING DUCTS

REMOVE EXISTING DUCTS

PROPOSED ROAD CROSSING

NEW COLUMN

NEW LANTERN

EXISTING SWITCHING STATION

EXISTING LANTERN

EXISTING PILLAR

EXISTING COLUMN

REMOVE COLUMN

EXISTING PADMOUNT SUBSTATION

REMOVE PILLAR

NEW INDUSTRIAL PILLAR

DUCT CONFIGURATION

REMOVE LANTERN

SITE PLAN '1'

SCALE 1:1000 @ A1

TYPICAL ROAD CROSSING

SCALE : NONE

Cadastral: © Land and Property Information 2016

AMENDMENTS

ORIGINAL ISSUE

DRAFT No. 01

connect

Connect Design Pty Ltd

Electrical Infrastructure Consultancy, Design & Construction

Tel: 02 9733 3333

Fax: 02 9733 3330

Email: mail@connecteng.com.au

6 Progress Cct, Prestons NSW 2170

PO Box 484, Casula Mall NSW 2170

connect

REF. NUMBER

DV052A

D05

TEMPLATE VERSION No. 4.3

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REFERENCE DRAWING'S

WORK ORDERS

GENERAL

OVERHEAD

UNDERGROUND

SUBSTATIONS

CAP / SAMP No.

UIS0845

AM PROJ. No.

2018/01427/001

UBD/PENGUIN REF

GIS MAP No

U82524

HV OP DIAGRAM

MAMRE 2, S6

LOCAL GOV AREA

PENRITH

ORIGINAL SCALE

DRAWN

R.AZZI

DATE

07/06/2019

CH'D

B.DUBEY

DESIGN

A.MANJI

DO NOT SCALE DIMENSIONS IN METRES

LENORE DRIVE (OFF) KEMPS CREEK

UIS0845

DUCT, TRENCH AND EASEMENT PLAN

LOT 6, 2, 2, 11, 3,

DP 229784, DP84578, DP1215268, DP1178389, DP85393

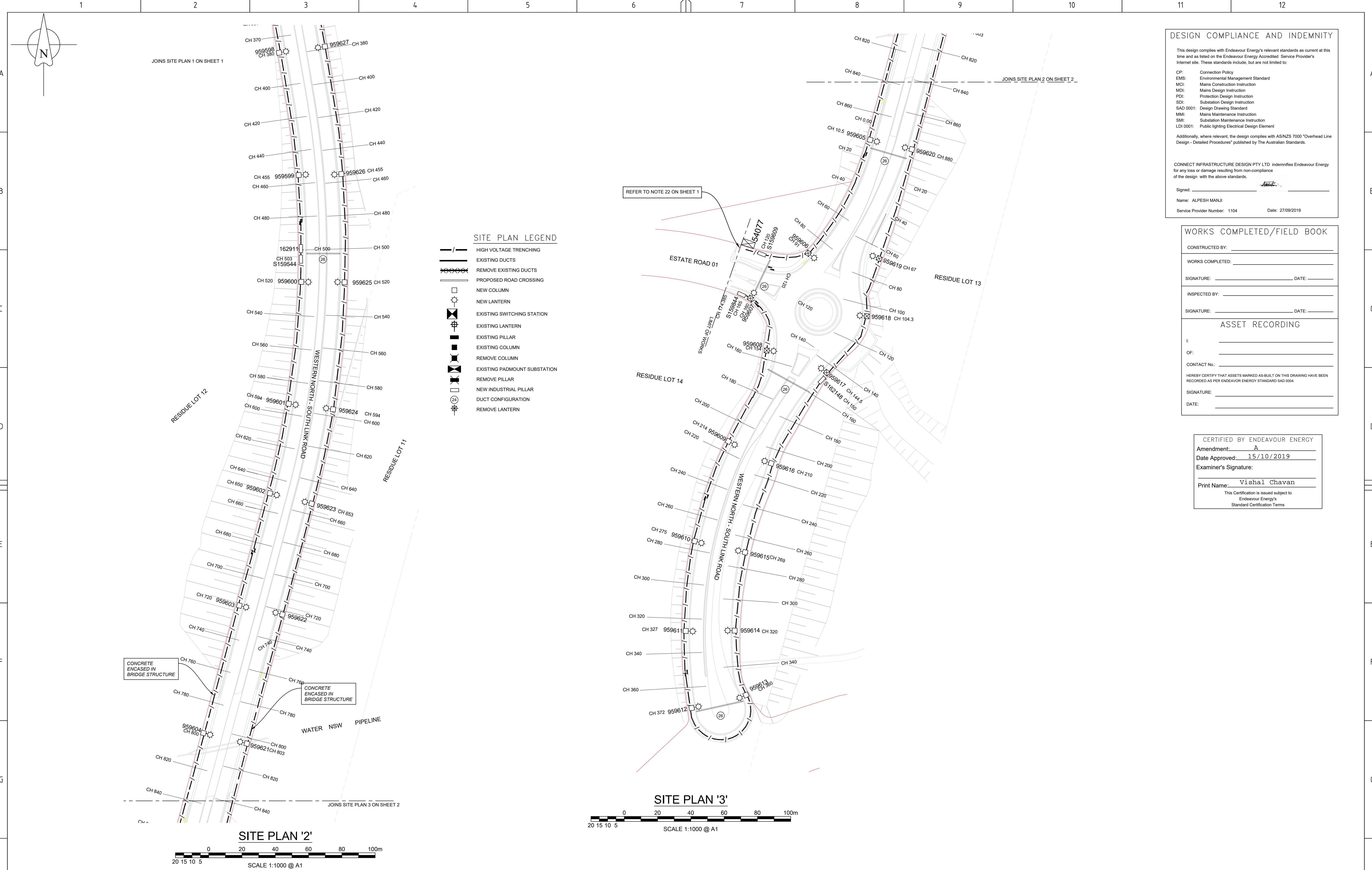
Endeavour Energy

A1

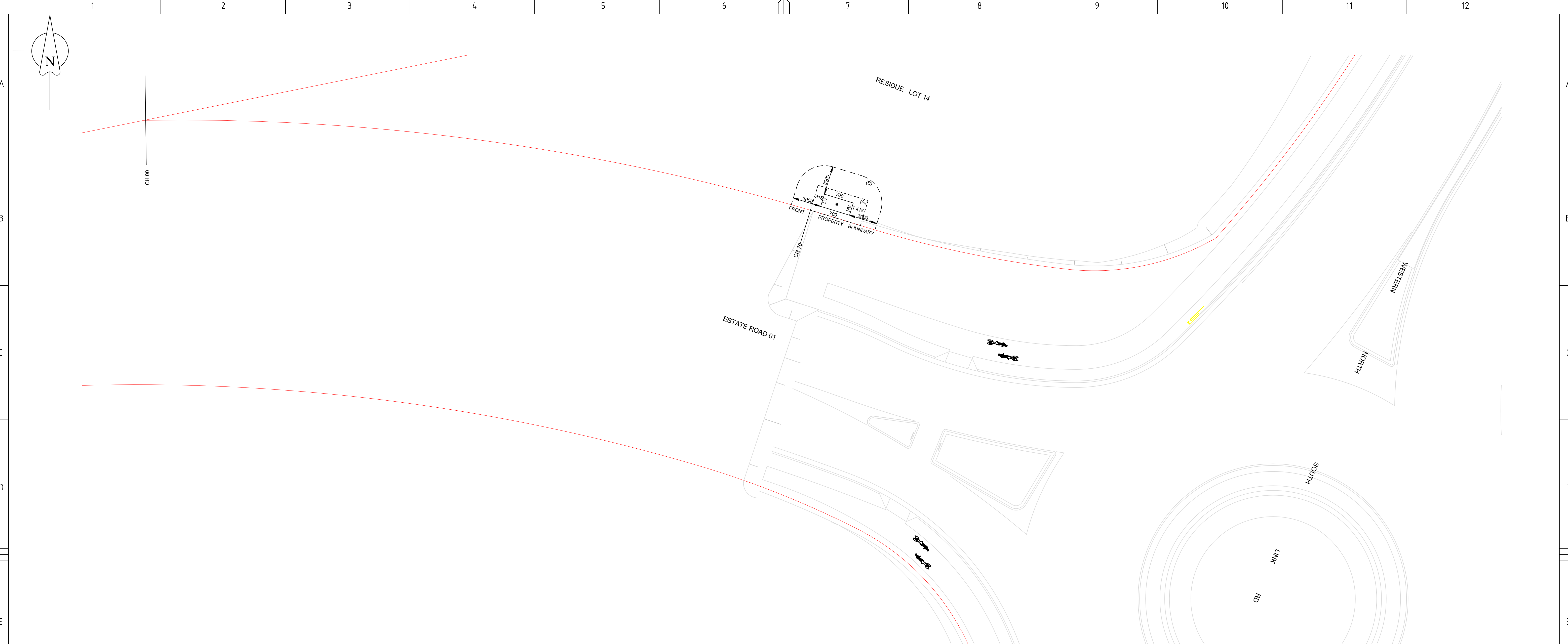
513624

A

SHEET No 1 OF 3 SHEETS

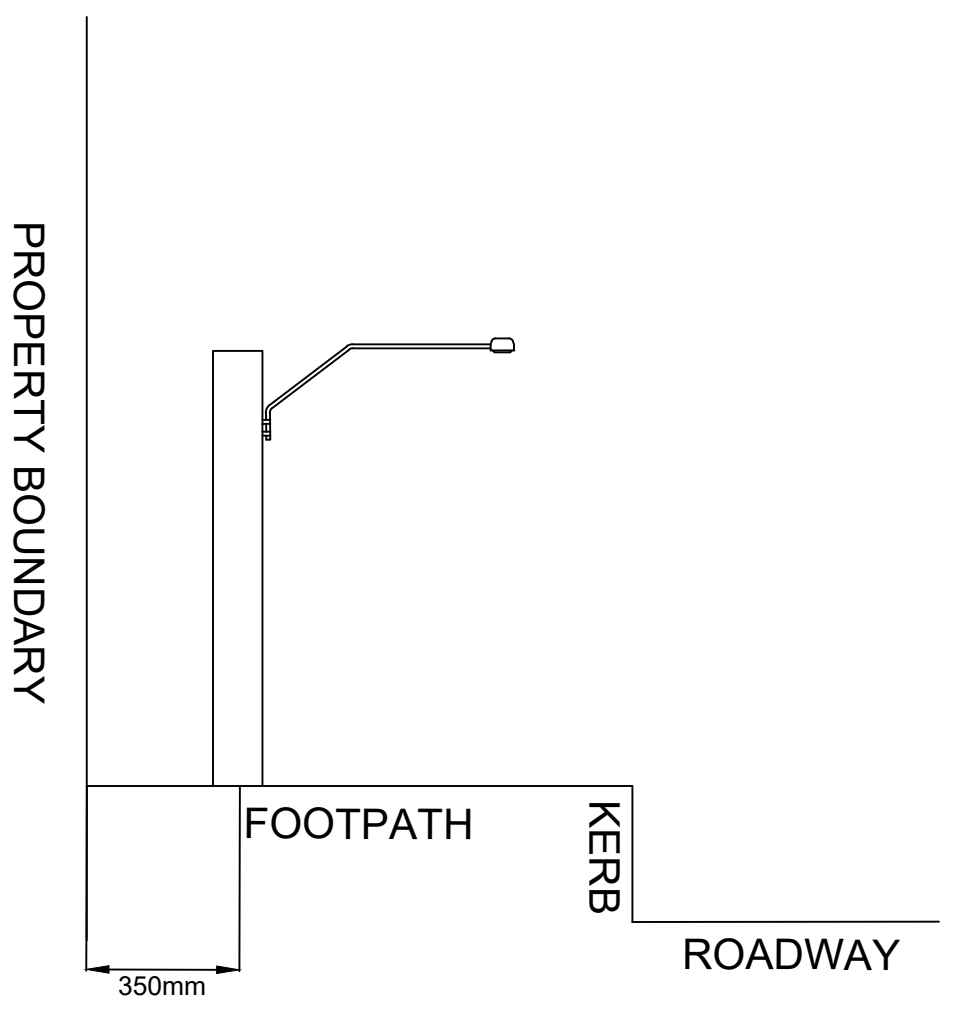


DESIGN COMPLIANCE AND INDEMNITY	
<p>This design complies with Endeavour Energy's relevant standards as current at this time and as listed on the Endeavour Energy Accredited Service Provider's Internet site. These standards include, but are not limited to:</p>	
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SAD 0001:	Design Drawing Standard
MMI:	Mains Maintenance Instruction
SMI:	Substation Maintenance Instruction
LDI 0001:	Public lighting Electrical Design Element
<p>Additionally, where relevant, the design complies with AS/NZS 7000 "Overhead Line Design - Detailed Procedures" published by The Australian Standards.</p>	
<p>CONNECT INFRASTRUCTURE DESIGN PTY LTD indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design with the above standards.</p>	
Signed: _____ <i>ALPESH MANJI</i>	
Name: ALPESH MANJI	
Service Provider Number: 1104 Date: 27/09/2019	
<h2>WORKS COMPLETED/FIELD BOOK</h2>	
CONSTRUCTED BY: _____	
WORKS COMPLETED: _____	
SIGNATURE: _____ DATE: _____	
INSPECTED BY: _____	
SIGNATURE: _____ DATE: _____	
<h2>ASSET RECORDING</h2>	
I: _____	
OF: _____	
CONTACT No.: _____	
<p>HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD SAD/0904.</p>	
SIGNATURE: _____	
DATE: _____	
<div><div>CERTIFIED BY ENDEAVOUR ENERGY</div><div>Amendment: <u> A </u></div><div>Date Approved: <u> 15/10/2019 </u></div><div>Examiner's Signature: _____</div><div>Print Name: <u> Vishal Chavan </u></div><div>This Certification is issued subject to Endeavour Energy's Standard Certification Terms</div></div>	

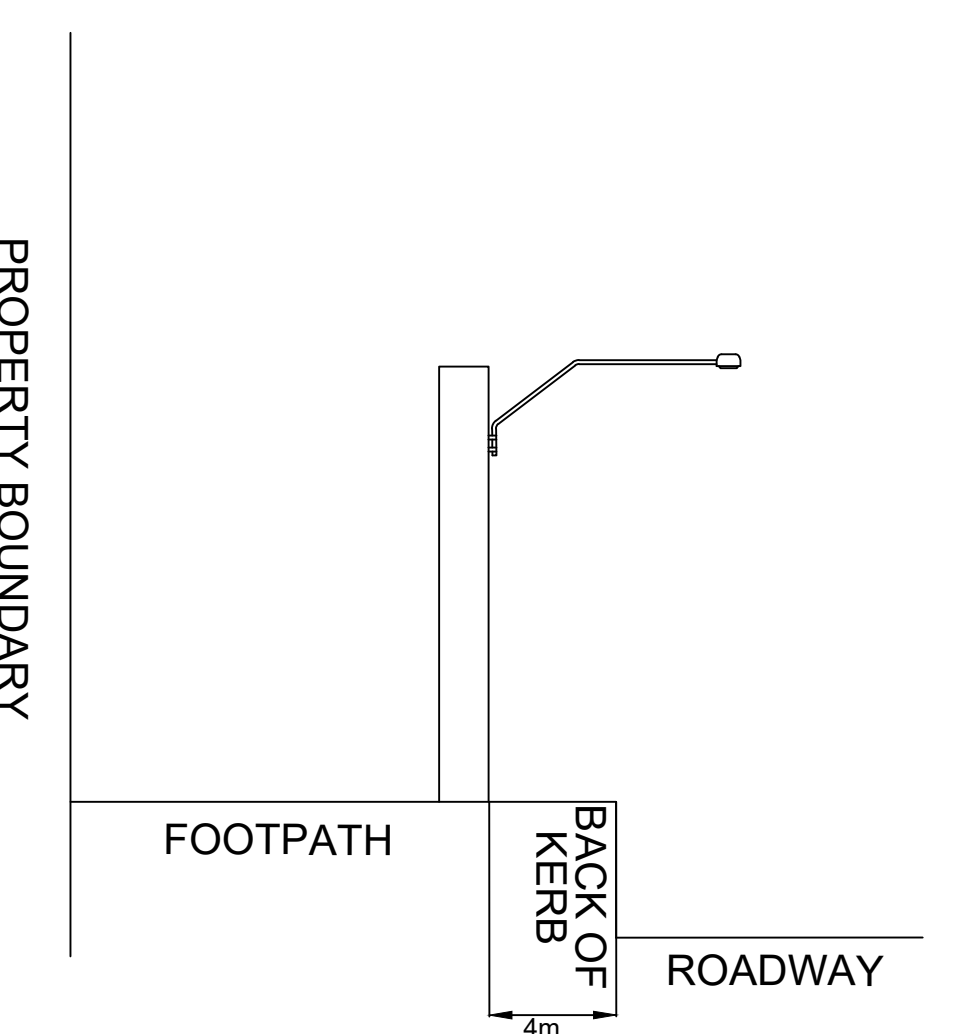


- (A) EASEMENT PADMOUNT SUBSTATION 2.75x5.5 CENTRED AROUND THE SUBSTATION PLINTH EXCEPT FOR 0.25 METRE OFFSET TOWARD THE HV END
- (B) RESTRICTION ON THE USE OF LAND IN RELATION TO THE FIRE RATING OF BUILDINGS MEASURED 3 METRES FROM SUBSTATION PLINTH
- SUBSTATION PLINTH 1.35x3.17 AT TOP OF CONCRETE (ALL OFFSETS TO PLINTH SHOWN FROM TOP OF CONCRETE)
- IF A PLAN OF SURVEY, PLEASE SHOW SUBSTATION NUMBER AND AT LEAST TWO OFFSETS TO PLINTH

**EASEMENT AND RESTRICTION ZONE DIAGRAM
FOR PADMOUNT SUBSTATION 54077
COMMON EARTHING - INDUSTRIAL**



**STREETLIGHT PROFILE
FOR ALL OTHER
COLUMNS**
NOT TO SCALE



**STREETLIGHT PROFILE FOR
COLUMNS 959590, 960200**
NOT TO SCALE

CERTIFIED BY ENDEAVOUR ENERGY
Amendment: A
Date Approved: 15/10/2019
Examiner's Signature: _____
Print Name: Vishal Chavan
This Certification is issued subject to Endeavour Energy's Standard Certification Terms

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MMI: Mains Maintenance Instruction
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LDI 0001: Public Lighting Electrical Design Element

Additionally, where relevant, the design complies with AS/NZS 7000 "Overhead Line Design - Detailed Procedures" published by The Australian Standards.

CONNECT INFRASTRUCTURE DESIGN PTY LTD indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design with the above standards.

Signed: _____
Name: ALPESH MANJI
Service Provider Number: 1104 Date: 27/09/2019

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____

WORKS COMPLETED: _____

SIGNATURE: _____ DATE: _____

INSPECTED BY: _____

SIGNATURE: _____ DATE: _____

ASSET RECORDING

I: _____

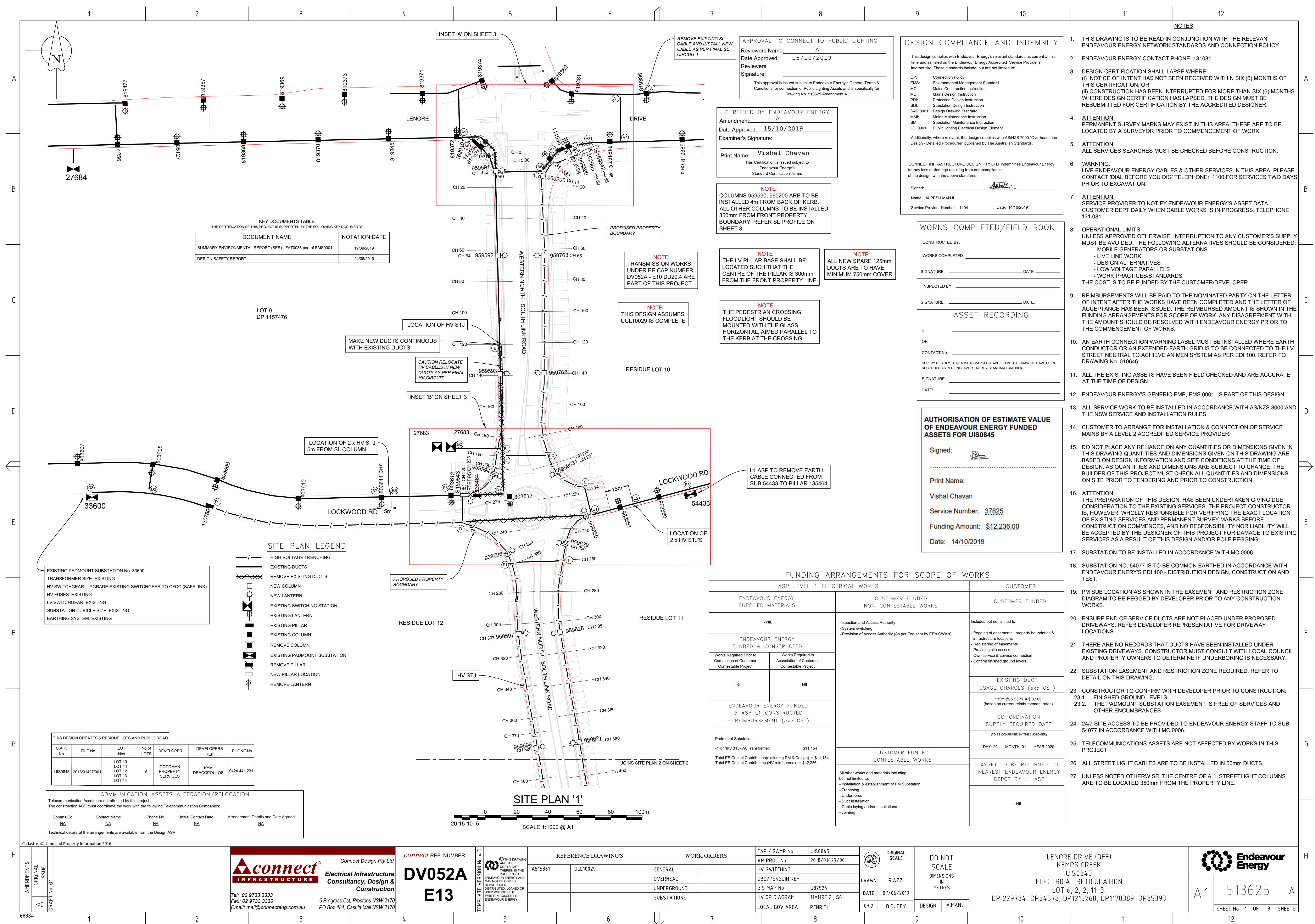
OF: _____

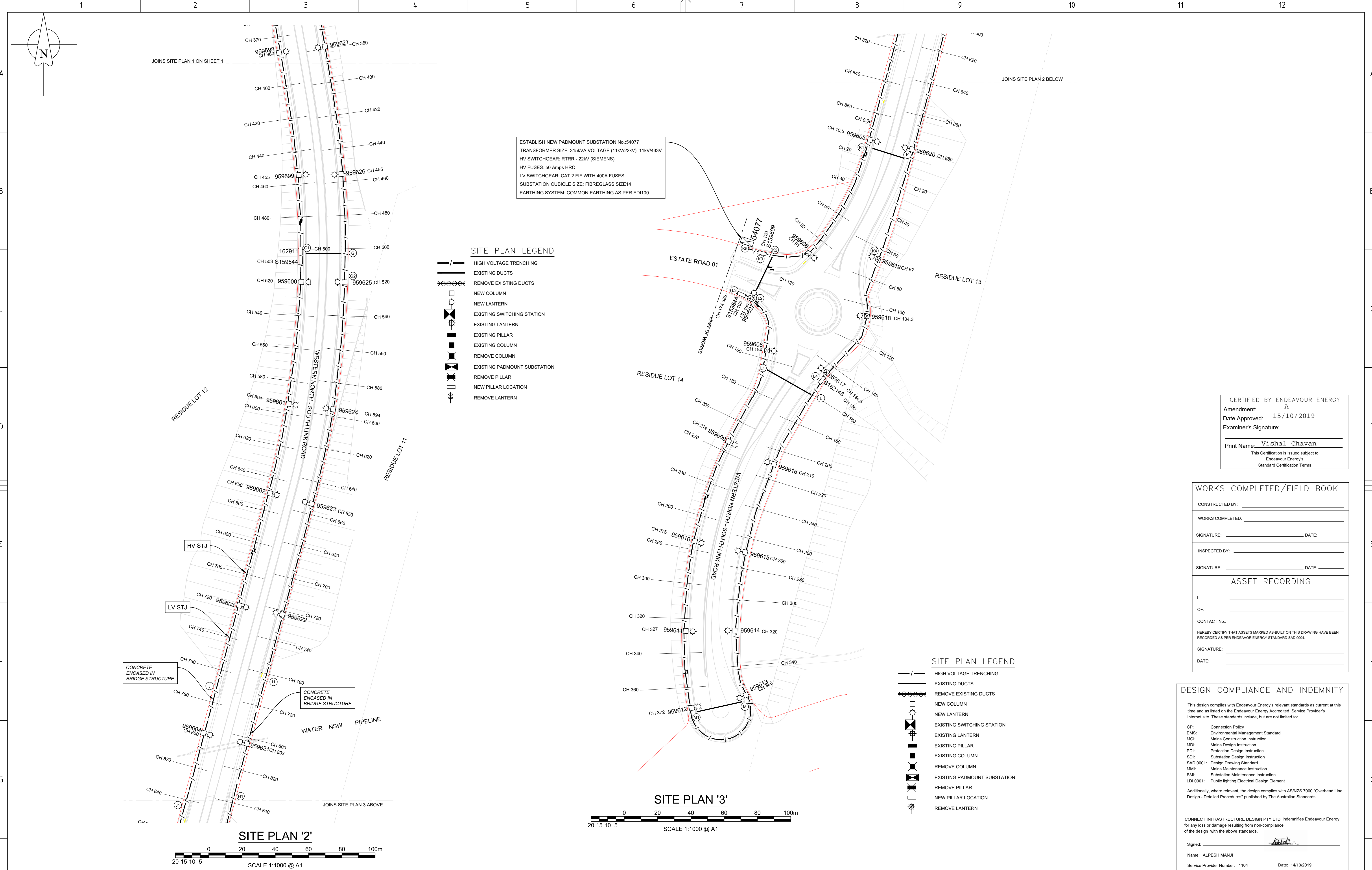
CONTACT No.: _____

HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOR ENERGY STANDARD SAD 0004.

SIGNATURE: _____

DATE: _____





CERTIFIED BY ENDEAVOUR ENERGY

Amendment: A

Date Approved: 15/10/2019

Examiner's Signature: _____

Print Name: Vishal Chavan

This Certification is issued subject to
Endeavour Energy's
Standard Certification Terms

WORKS COMPLETED/FIELD BOOK	
CONSTRUCTED BY:	_____
WORKS COMPLETED:	_____
SIGNATURE:	_____ DATE: _____
INSPECTED BY:	_____
SIGNATURE:	_____ DATE: _____
ASSET RECORDING	
I:	_____
OF:	_____
CONTACT NO.:	_____
HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOR FIELD STANDARD SAD 0004.	
SIGNATURE:	_____
DATE:	_____


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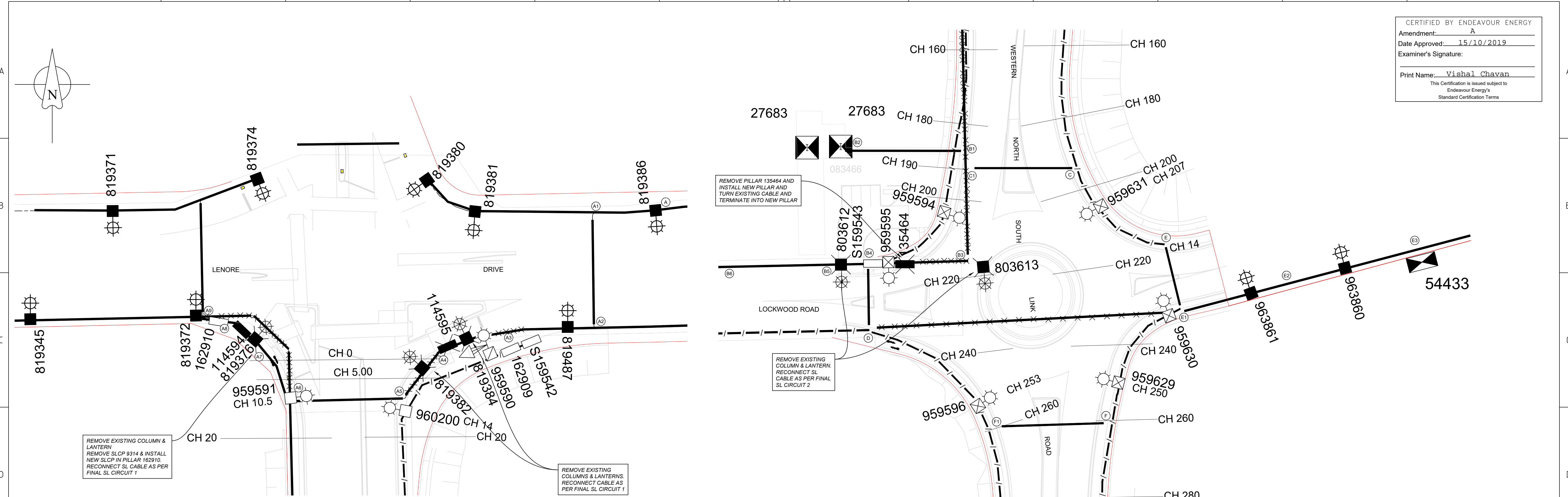
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CONNECT INFRASTRUCTURE DESIGN PTY LTD indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design, with the above standards.

Signed: _____ 

Name: ALPESH MANJI

Service Provider Number: 1104 Date: 14/10/2019



<h1 style="margin: 0;">WORKS COMPLETED</h1>	<h1 style="margin: 0;">FIELD BOOK</h1>
<p>CONSTRUCTED BY: _____</p> <p>WORKS COMPLETED: _____</p> <p>SIGNATURE: _____ DATE: _____</p> <p>INSPECTED BY: _____</p> <p>SIGNATURE: _____ DATE: _____</p>	
<h2 style="margin: 0;">ASSET RECORDING</h2>	
<p>I: _____</p> <p>OF: _____</p> <p>CONTACT No.: _____</p> <p>HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOR ENERGY STANDARD SAD 0004</p> <p>SIGNATURE: _____</p> <p>DATE: _____</p>	

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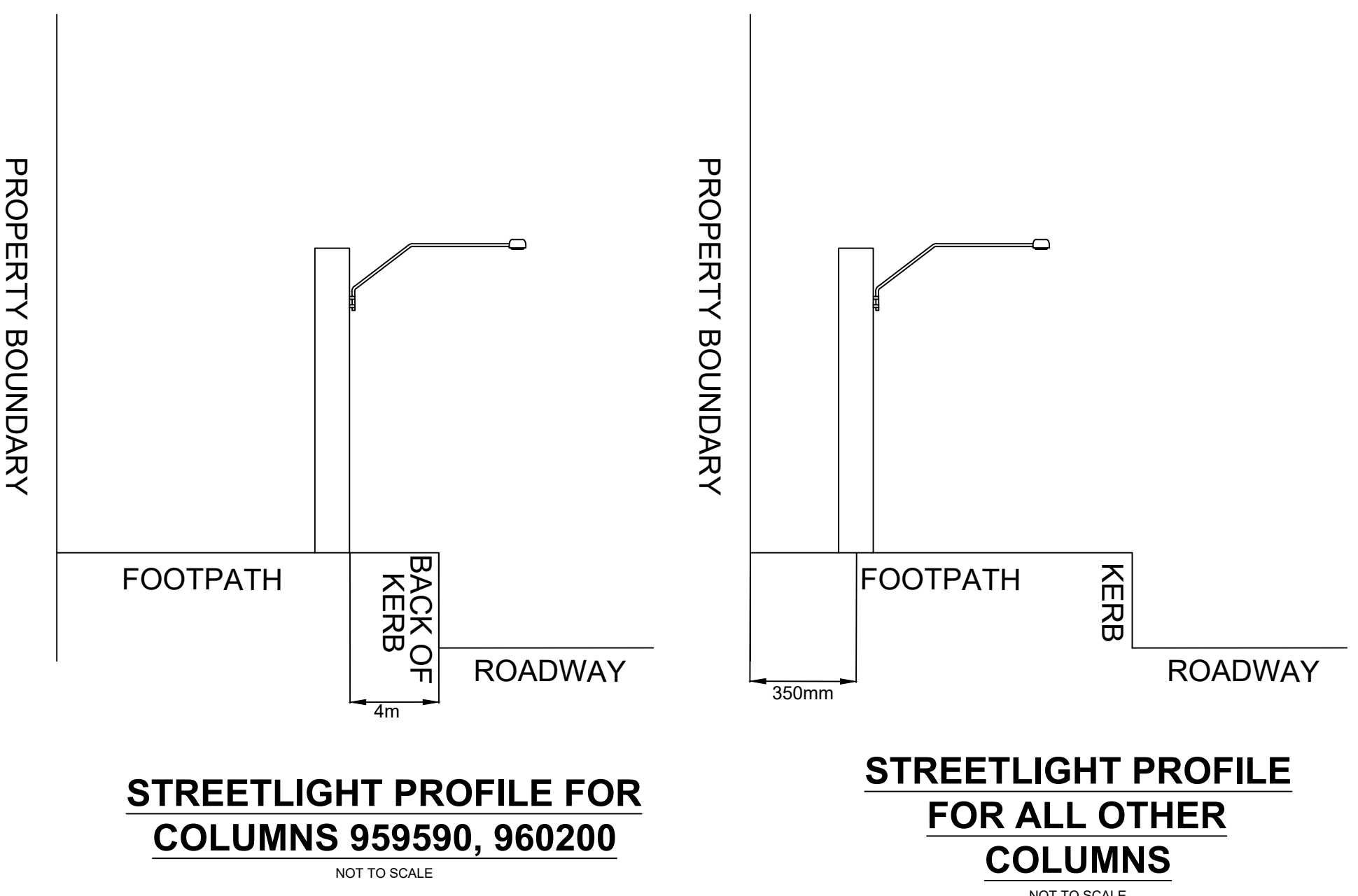
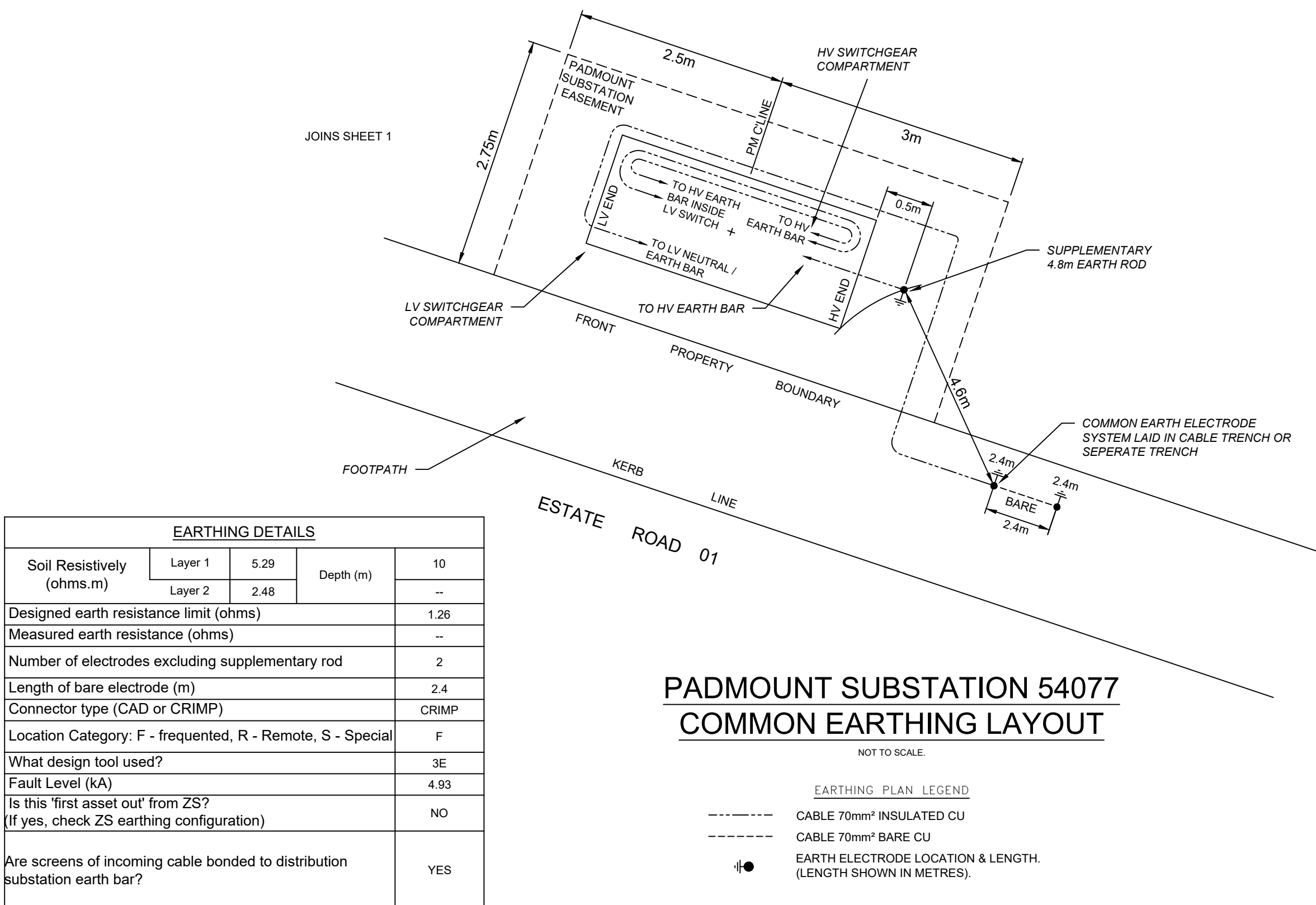
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CONNECT INFRASTRUCTURE DESIGN PTY LTD indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design with the above standards.

Signed: _____ *ALPESH MANJI*

Name: ALPESH MANJI

Service Provider Number: 1104 Date: 14/10/2019



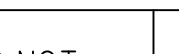

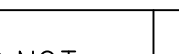


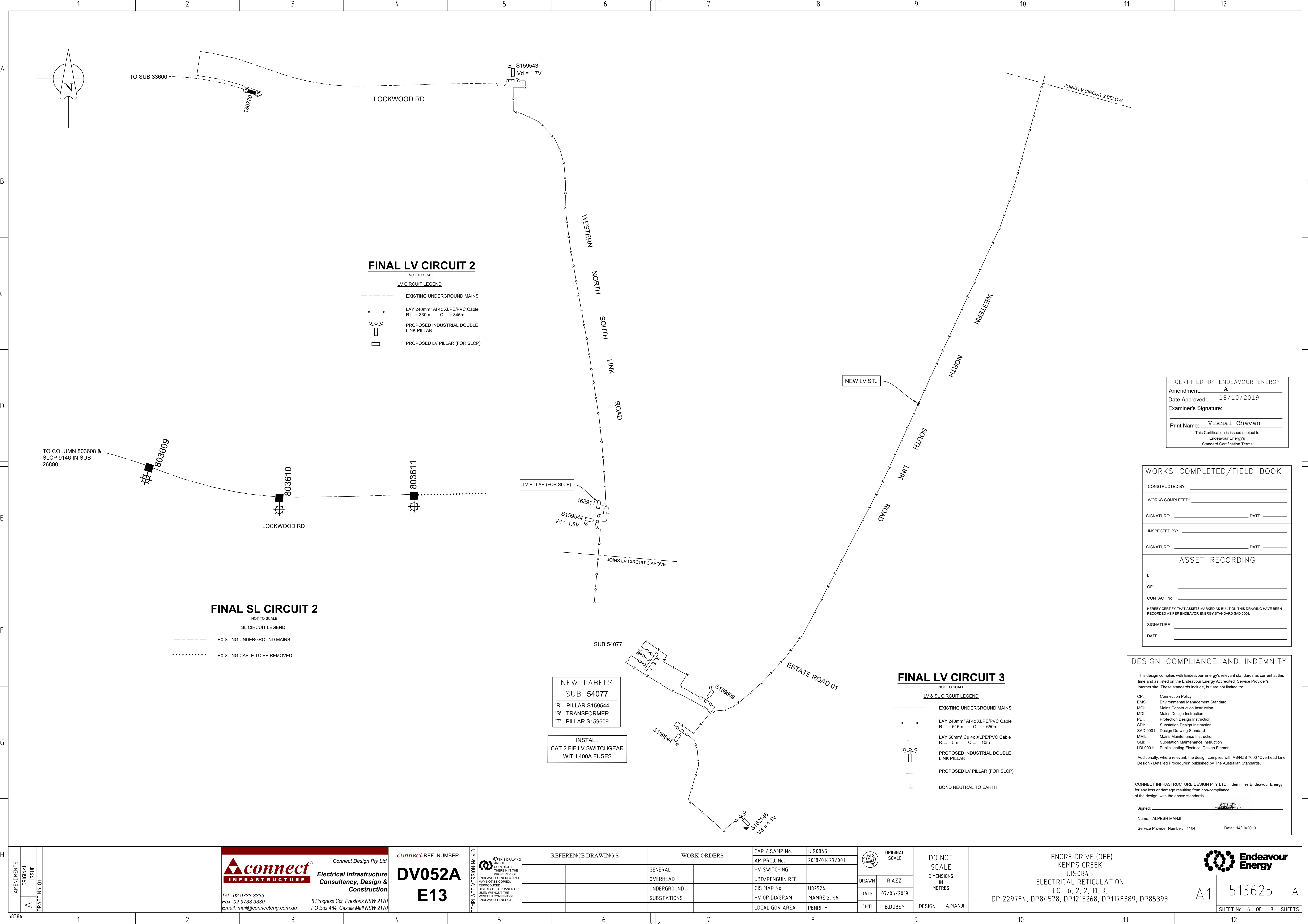
EARTHING DETAILS				
Soil Resistivity (ohms.m)	Layer 1	5.29	Depth (m)	10
	Layer 2	2.48		--
Designed earth resistance limit (ohms)			1.26	
Measured earth resistance (ohms)			--	
Number of electrodes excluding supplementary rod			2	
Length of bare electrode (m)			2.4	
Connector type (CAD or CRIMP)			CRIMP	
Location Category: F - frequented, R - Remote, S - Special			F	
What design tool used?			3E	
Fault Level (kA)			4.93	
Is this 'first asset out from ZS? (If yes, check ZS earthing configuration)			NO	
Are screens of incoming cable bonded to distribution substation earth bar?			YES	

EARTHING PLAN LEGEND

-----	CABLE 70mm ² INSULATED CU
-----	CABLE 70mm ² BARE CU
⦿	EARTH ELECTRODE LOCATION & LENGTH. (LENGTH SHOWN IN METRES).

AMENDMENTS	ORIGINAL	ISSUE	DRAFT No. 01	<div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></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H	ANENDMENTS	ORIGINAL	A	DRAFT No. 01	<div><div><div>connect</div><div>INFRASTRUCTURE</div></div><div>Connect Design Pty Ltd</div><div>Electrical Infrastructure Consultancy, Design & Construction</div><div>Tel: 02 9733 3333 Fax: 02 9733 3330 Email: mail@connecteng.com.au</div><div>6 Progress Cct, Prestons NSW 2170 PO Box 484, Casula Mail NSW 2170</div></div>	connect REF. NUMBER <div>DV052A</div> <div>E13</div>	TEMPLATE VERSION No. 4.3 <div> THIS DRAWING AND THE COPYRIGHT ENDEAVOUR ENERGY AND MAY NOT BE COPIED, REPRODUCED, DISTRIBUTED, LOANED OR USED WITHOUT THE WRITTEN CONSENT OF ENDEAVOUR ENERGY</div>	REFERENCE DRAWING'S		WORK ORDERS		CAP / SAMP No. UIS0845	<div></div> ORIGINAL SCALE	DO NOT SCALE DIMENSIONS IN METRES	LENORE DRIVE (OFF) KEMPS CREEK UIS0845 ELECTRICAL RETICULATION LOT 6, 2, 2, 11, 3, DP 229784, DP84578, DP1215268, DP1178389, DP85393	<div></div>	A1	513625	A	SHEET No 4 OF 9 SHEETS	H
									GENERAL OVERHEAD UNDERGROUND SUBSTATIONS		AM PROJ. No. 2018/01427/001 HV SWITCHING UBD/PENGUIN REF GIS MAP No. U82524 HV OP DIAGRAM MAMRE 2, 56 LOCAL GOV AREA PENRITH	<div></div> DRAWN R.AZZI DATE 07/06/2019 CH'D B.DUBEY DESIGN A.MANJI									



FINAL LV CIRCUIT 2

- NOT TO SCALE
- LV CIRCUIT LEGEND
- EXISTING UNDERGROUND MAINS
 - x-x- LAY 240mm² Al 4c XLPE/PVC Cable
R.L. = 330m C.L. = 345m
 - PROPOSED INDUSTRIAL DOUBLE LINK PILLAR
 - PROPOSED LV PILLAR (FOR SLCP)

FINAL SL CIRCUIT 2

- NOT TO SCALE
- SL CIRCUIT LEGEND
- EXISTING UNDERGROUND MAINS
 - EXISTING CABLE TO BE REMOVED

FINAL LV CIRCUIT 3

- NOT TO SCALE
- LV & SL CIRCUIT LEGEND
- EXISTING UNDERGROUND MAINS
 - x-x- LAY 240mm² Al 4c XLPE/PVC Cable
R.L. = 615m C.L. = 650m
 - #- LAY 50mm² Cu 4c XLPE/PVC Cable
R.L. = 5m C.L. = 10m
 - PROPOSED INDUSTRIAL DOUBLE LINK PILLAR
 - PROPOSED LV PILLAR (FOR SLCP)
 - BOND NEUTRAL TO EARTH

NEW LABELS
SUB 54077
'R' - PILLAR S159544
'S' - TRANSFORMER
'T' - PILLAR S159609

INSTALL
CAT 2 FIF LV SWITCHGEAR
WITH 400A FUSES

CERTIFIED BY ENDEAVOUR ENERGY
Amendment: A
Date Approved: 15/10/2019
Examiner's Signature: _____
Print Name: Vishal Chavan
This Certification is issued subject to Endeavour Energy's Standard Certification Terms

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____

WORKS COMPLETED: _____

SIGNATURE: _____ DATE: _____

INSPECTED BY: _____

SIGNATURE: _____ DATE: _____

ASSET RECORDING

I: _____

OF: _____

CONTACT No.: _____

HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOR ENERGY STANDARD SAD 0004.

SIGNATURE: _____

DATE: _____

DESIGN COMPLIANCE AND INDEMNITY

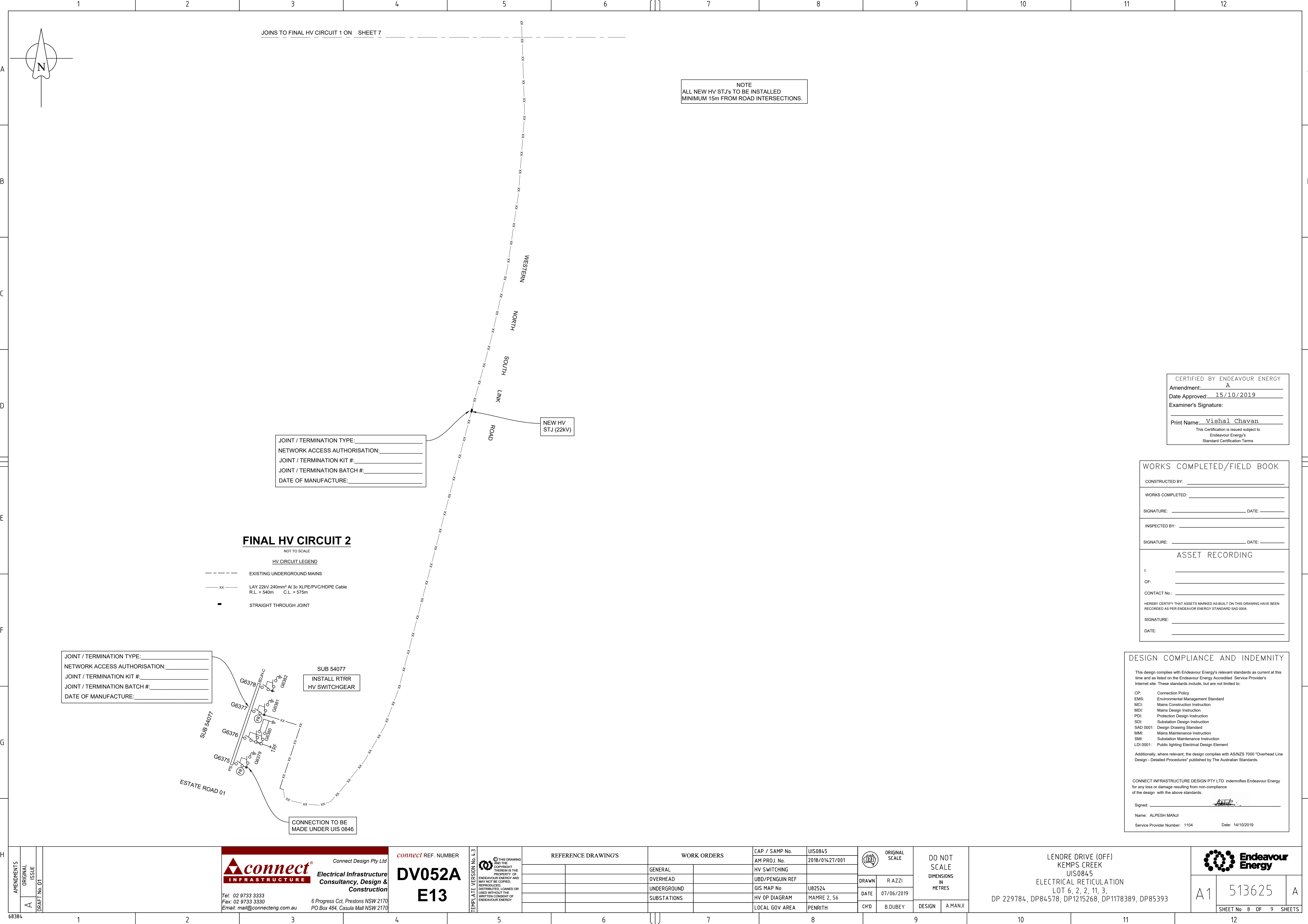
This design complies with Endeavour Energy's relevant standards as current at this time and as listed on the Endeavour Energy Accredited Service Provider's Internet site. These standards include, but are not limited to:

CP: Connection Policy
EMS: Environmental Management Standard
MCI: Mains Construction Instruction
MDI: Mains Design Instruction
PDI: Protection Design Instruction
SDI: Substation Design Instruction
SAD 0001: Design Drawing Standard
MMI: Mains Maintenance Instruction
SMI: Substation Maintenance Instruction
LDI 0001: Public lighting Electrical Design Element

Additionally, where relevant, the design complies with AS/NZS 7000 "Overhead Line Design - Detailed Procedures" published by The Australian Standards.

CONNECT INFRASTRUCTURE DESIGN PTY LTD indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design with the above standards.

Signed: _____
Name: ALPESH MANJI
Service Provider Number: 1104
Date: 14/10/2019



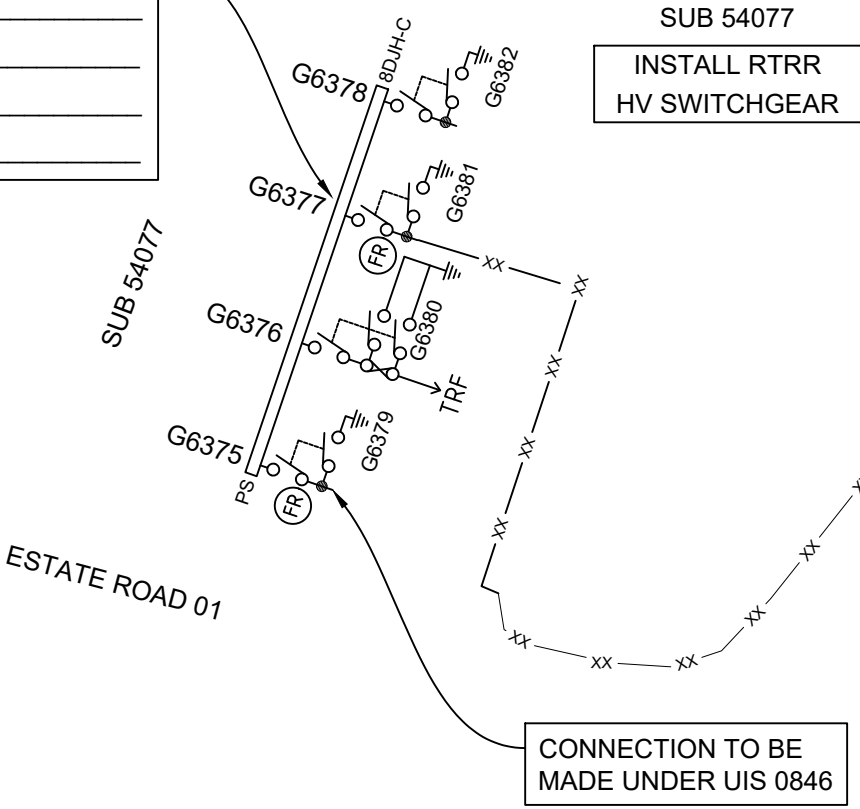
NOTE
ALL NEW HV STJ's TO BE INSTALLED
MINIMUM 15m FROM ROAD INTERSECTIONS.

JOINT / TERMINATION TYPE: _____
NETWORK ACCESS AUTHORISATION: _____
JOINT / TERMINATION KIT #: _____
JOINT / TERMINATION BATCH #: _____
DATE OF MANUFACTURE: _____

FINAL HV CIRCUIT 2

- NOT TO SCALE
- HV CIRCUIT LEGEND**
- EXISTING UNDERGROUND MAINS
 - xx LAY 22kV 240mm² Al 3c XLPE/PVC/HDPE Cable
R.L. = 540m C.L. = 575m
 - STRAIGHT THROUGH JOINT

JOINT / TERMINATION TYPE: _____
NETWORK ACCESS AUTHORISATION: _____
JOINT / TERMINATION KIT #: _____
JOINT / TERMINATION BATCH #: _____
DATE OF MANUFACTURE: _____



SUB 54077
INSTALL RTRR
HV SWITCHGEAR

CERTIFIED BY ENDEAVOUR ENERGY
Amendment: A
Date Approved: 15/10/2019
Examiner's Signature: _____
Print Name: Vishal Chavan
This Certification is issued subject to Endeavour Energy's Standard Certification Terms

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____

WORKS COMPLETED: _____

SIGNATURE: _____ DATE: _____

INSPECTED BY: _____

SIGNATURE: _____ DATE: _____

ASSET RECORDING

I: _____

OF: _____

CONTACT No.: _____

HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOR ENERGY STANDARD SAD 0004.

SIGNATURE: _____

DATE: _____

DESIGN COMPLIANCE AND INDEMNITY

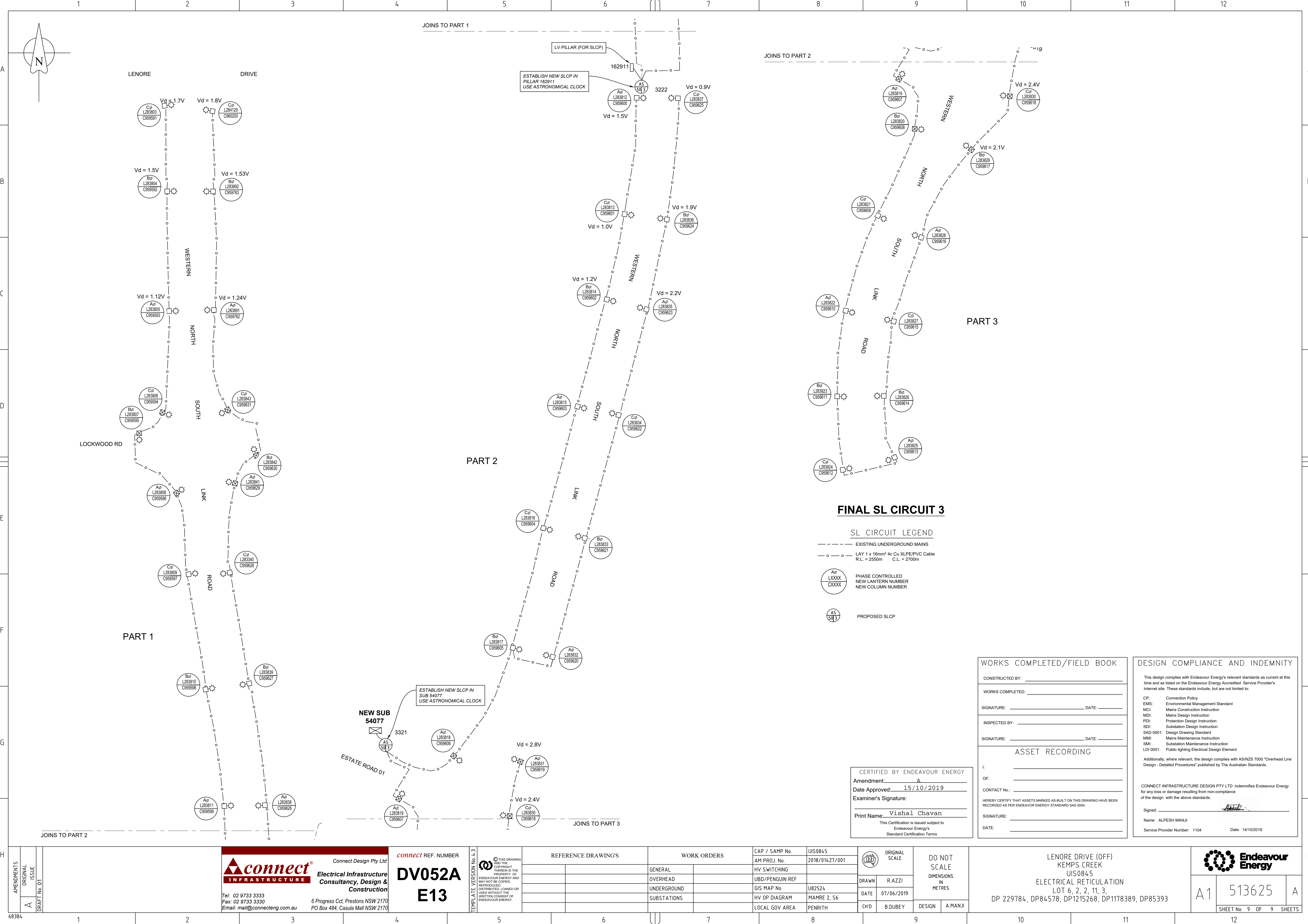
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SMI:	Substation Maintenance Instruction
LDI 0001:	Public Lighting Electrical Design Element

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Signed: _____
Name: ALPESH MANJI
Service Provider Number: 1104 Date: 14/10/2019



AMENDMENTS ORIGINAL ISSUE DRAFT No. 01		<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div>connect</div><div>INFRASTRUCTURE</div></div><div>Connect Design Pty Ltd</div><div>Electrical Infrastructure Consultancy, Design & Construction</div><div>Tel: 02 9733 3333 Fax: 02 9733 3330 Email: mail@connecteng.com.au</div><div>6 Progress Cct, Prestons NSW 2170 PO Box 484, Casula Mall NSW 2170</div></div>		connect REF. NUMBER DV052A E13		<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div>THIS DRAWING AND THE COPYRIGHT THEREIN IS THE PROPERTY OF ENDEAVOUR ENERGY AND MAY NOT BE COPIED, REPRODUCED, DISTRIBUTED, LOANED OR USED WITHOUT THE WRITTEN CONSENT OF ENDEAVOUR ENERGY</div></div></div>		REFERENCE DRAWING'S		WORK ORDERS		CAP / SAMP No.		UIS0845		<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div>ORIGINAL SCALE</div></div></div>		DO NOT SCALE DIMENSIONS IN METRES		LENORE DRIVE (OFF) KEMPS CREEK UIS0845 ELECTRICAL RETICULATION LOT 6, 2, 2, 11, 3, DP 229784, DP84578, DP1215268, DP1178389, DP85393		<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div></div><div>Endeavour Energy</div></div><div>A1</div><div>513625</div><div>A</div></div>	
												AM PROJ. No.		2018/01427/001									
												HV SWITCHING											
												UBD/PENGUIN REF											
		GENERAL				DRAWN		R.AZZI															
		OVERHEAD				DATE		07/06/2019															
		UNDERGROUND																					
		SUBSTATIONS																					

26 November 2018



Endeavour Energy Ref: UIS0846 – 2018/01428/001
Customer Ref:

Connect Infrastructure
PO Box 484
CASULA MALL NSW 2170

Attention: Brendon Hince

Dear Sir/Madam

UIS0846 – LOT 14,1, DP ,663937, Land Subdivision Application: Aldington Road (off), KEMPS CREEK

Your Proposed Method of Supply has been assessed, and Endeavour Energy has determined the method of supply requirements as outlined in the enclosed Design Brief. Please use this Design Brief in preparation of the design package which you will submit for certification.

The design must comply with all the conditions specified in this document, the Terms and Conditions of Endeavour Energy's Model Standing Offer for a Standard Connection Service and all relevant Endeavour Energy standards and instructions.

This Design Brief is valid for three (3) months from the date of issue.

A final Determination of Funding and a Payment Advice for Ancillary Network Services Fees applicable to this phase of the project are attached.

Property tenure is required for this project.

The applicable bond for this project is:

Property Tenure Bond

\$Nil

A Payment Advice for the total bond required is attached. This Payment Advice along with the agreement to enter (Form FPJ 5013), signed by the owner, must be returned with the evidence of payment of the Property Tenure Bond.

Should you have any enquiries regarding your application please contact the undersigned.

Yours faithfully,

A handwritten signature in dark ink, appearing to read "Saroun Ly", with a long, sweeping flourish extending to the right.

Saroun Ly
Contestable Works Engineer
Ph: 9853 6152
Email: cwtech@endeavourenergy.com.au

26 November 2018

Endeavour Energy Ref: UIS0846 – 2018/01428/001
Customer Ref:

Design Brief

Proposed Method Of Supply:

Feeders MM1232 and MM1342 are to be extended to supply the Oakdale West Estate.

- 1- Substations DS28123 and DS33600 are to have the HV switchgear upgraded to RTRR-C to facilitate the extension of these feeders.
- 2- Extend HV Feeder MM1342 from DS33600 to Oakdale West Estate development via existing spare conduits to Pillar 130780 and then via new conduits Eastward along Lockwood Road and then Southward along the new Western North South Link Road (refer to Attachment A6 of PMOS Sketch).
- 3- Install Type 24 conduits from Pillar 130780 to proposed Western North South Link Road (CAP Number UIS0845).
- 4- From the existing conduits located on the North-Western boundary of the development to new Road 01, create a new 3m wide easement for new conduits. Install Type 24 conduits in the new easement.
- 5- Extend HV feeder MM1232 from DS28123 to the development site (refer to Attachment A7 – PMOS Sketch)
- 6- Install a new 315kVA padmount substation to supply the street lighting and the temporary supply for construction of South Pipe Zone Substation. Substation is proposed to be configured RTR with Cat 2 FIF LV end. Temporary supply for South Pipe ZS construction is to be from this substation via a new pillar.
- 7- All new HV cable to be 11kV 3C 240mm² Cu.
- 8- All new conduits installed on the development site are to be configured as Type 26.
- 9- Street lighting to be in accordance with EE standards and Penrith City Council lighting category requirements.

Conditions Of Supply Requirement:

The above MOS is acceptable with the followings:

- 1- Install 4 x 125mm ducts along Lockwood Rd.
- 2- Install 4 x 125mm ducts along new easement along North-West boundary of precinct.
- 3- Agreed to item 8 above. The only difference would be along ROAD NO.1, on the western side of the road, north of the future intersection with only 4 x 125mm ducts will be required. *Note, Capacity planner requires to establish a future link to the north-western boundary of the precinct to future ROAD NO.4. This is not a requirement for this application but it may be worthwhile keeping in mind so that this link can be easily established in the future. Refer to diagram.*

The scope of works is to be undertaken in accordance with all relevant Endeavour Energy policies, regulations and network standards.

All service works are to comply with the NSW Service and Installation Rules.

Determination of Funding

Endeavour Energy Supplied Materials:

Nil

Endeavour Energy Funded and Constructed:

Nil

Endeavour Energy Funded and Customer (ASP L1) Constructed – Reimbursement Paid by Endeavour Energy:

Capital contribution:

- For urban subdivision as per AVS:
 - HV light trenching and reinstatement
 - HV cable pulling through duct
 - HV ducts laying on trench
 - HV cable
 - HV cable terminations, UGOH, STJs
- Spare HV duct as per Fact Sheet 11.

Note, Endeavour Energy will not pay capital cost contribution towards the 315kVA substation's package as it will be used for a temporary builder supply and to be replaced in future project under UIL 5503. Endeavour Energy will pay capital cost contribution towards the larger PM substation's package for permanent load under UIL5503.

Reimbursements to be paid to Endeavour Energy by Customer:

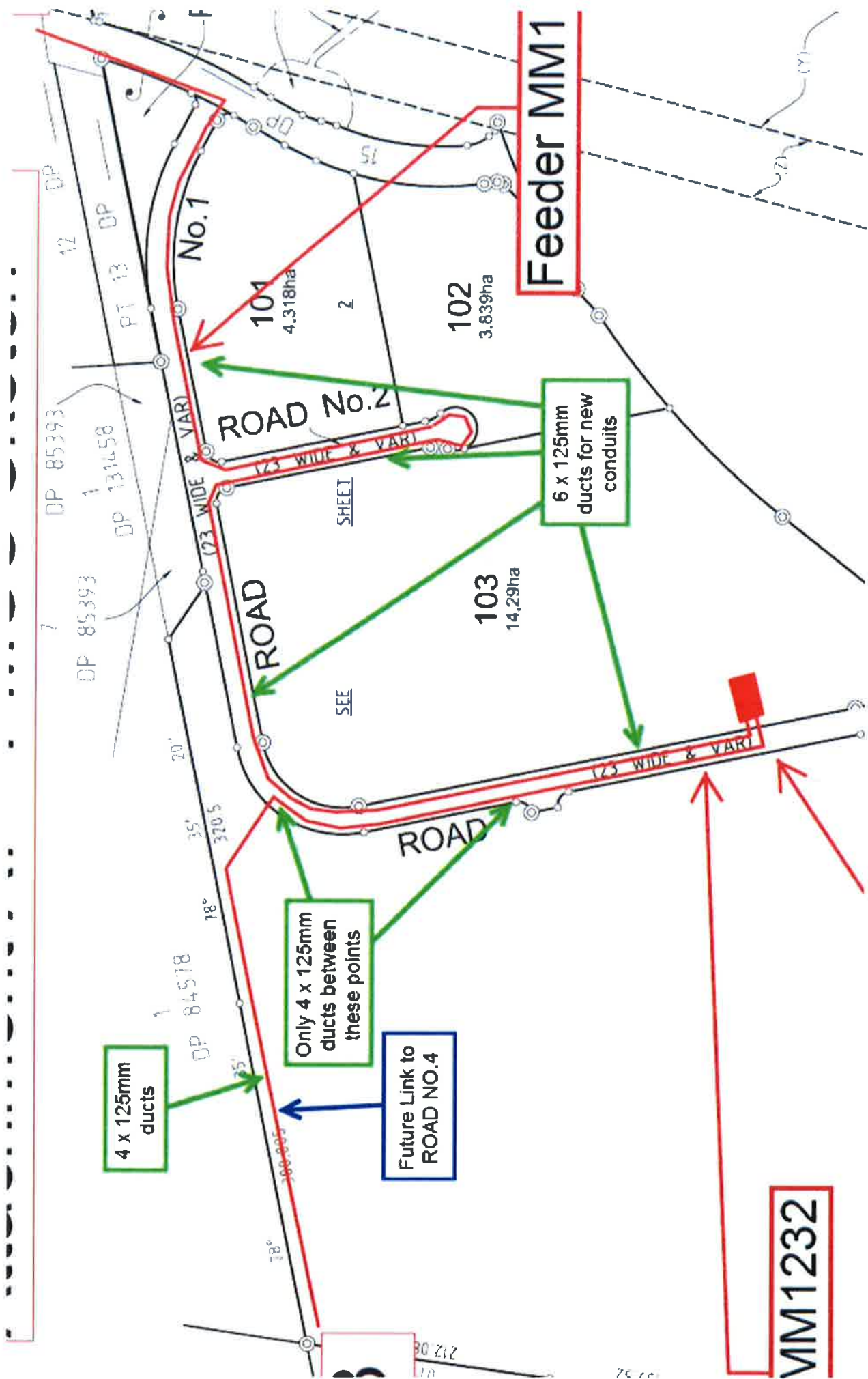
Duct usage as per Fact Sheet 11.

Customer Funded Non-Contestable Works:

Network switching, substation commissioning, contract inspection

Customer Funded Contestable Works:

All other works required.



AS&P to review design.

APPENDIX D

Environmental Management Policy

ENVIRONMENTAL MANAGEMENT POLICY

Robson Civil Projects is committed to the provision of a broad range of civil construction services in an environmentally conscientious and sustainable manner that exceeds Client satisfaction and the expectations of internal and external parties at all times.

Environmental management practices are incorporated into all aspects of business operations with the aim of delivering business objectives balanced with our commitment to protecting the environment and preventing pollution from our activities.

Robson will deliver our business and environmental objectives through:

- Visible accountable leadership and open communication at all levels to promote the effective application of the Robson Management System across the business;
- The provision of practical and effective environmental management processes to meet the requirements set out in AS/NZS ISO 14001:2016, applicable legal obligations, client expectations and other requirements;
- The application of comprehensive risk management practices at all levels of the business to identify our environmental aspects and impacts and develop suitable control measures;
- Planned reviews and regular audits of environmental management processes at functional and project levels to ensure continual improvement;
- Setting measurable and realistic objectives and targets and monitoring progress towards their achievement at all functional levels of the business;
- The provision of induction training to raise awareness of environmental requirements, individual obligations towards proactive environmental management, the potential effects of departure from procedure and the benefits of improved personal performance;
- Thorough investigation of Incidents / Events to determine cause and develop, communicate and implement corrective actions to prevent recurrence;
- The establishment and use of procurement processes that sets out environmental obligations to our subcontractor partners and suppliers;
- Communication and promotion of this Policy through company and site induction training and
- The Review and adjustment of this Policy and the RMS where required.

Robson management show commitment to this Policy through the provision of skilled resources at all levels of the business, ongoing training and proactive interaction with workers at all levels.

It is our goal to deliver our works in such a way as to prevent adverse impacts on the environment and provide services to our Clients and the community for the betterment of all.

The requirements of this Policy will be communicated through our induction processes and be displayed within all offices, on our projects and made available via the company Intranet and website.



Grant Robson
Managing Director
January 2019

APPENDIX E

SSD 7348 Conditions

Table A Development Consent SSD 7348

Condition	Where Addressed in CEMP
SCHEDULE B: CONDITIONS OF CONSENT FOR CONCEPT PROPOSAL	
Future Development Applications	
B2. To avoid any doubt, this Concept Proposal consent does not permit the construction or operation of any Development, except for the Stage 1 DA covered by Schedule D.	Noted
B3. This Concept Proposal consent does not approve the building layouts shown on Lots 2E, 2F, 2G, 2H, 2J and 4A on Figure 1 in Appendix 1. The location of the buildings on these lots must be assessed by separate DAs, and must satisfy the interface requirements of Conditions C3 and C4.	Noted. No construction works will be undertaken on these Lots.
Statutory Requirements	
B4. The Applicant shall ensure that all licences, permits, and approvals/consents are obtained as required by law and maintained as required throughout the life of the Concept Proposal. No condition of this consent removes the obligation for the Applicant to obtain, renew or comply with such licences, permits or approvals/consents.	Noted
Terms of Consent	
B5. The Applicant shall carry out the Concept Proposal in accordance with the: <ul style="list-style-type: none"> a) EIS and RTS; b) the plans in Appendix 1 and Appendix 2; and c) the Applicant's Management and Mitigation Measures in Appendix 7. 	Noted
B6. If there is any inconsistency between the plans and documents referred to above, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.	Noted
B7. The Applicant shall comply with any reasonable requirement(s) of the Planning Secretary arising from the Department's assessment of: <ul style="list-style-type: none"> a) any reports, plans or correspondence that are submitted in accordance with this consent; and b) the implementation of any actions or measures contained within these reports, plans or correspondence. 	Noted
Limits of Consent	
B8. This consent lapses five (5) years after the date from which it operates, unless any Stage of the Development has physically commenced on the land to which the consent applies before that date.	Noted

Condition	Where Addressed in CEMP																										
<p>B10. The Applicant shall ensure the Concept Proposal is consistent with the development controls in Table 2.</p> <p style="text-align: center;">Table 2: Development Controls</p> <table> <tr> <th>Development Aspect</th><th>Control</th></tr> <tr> <td>Minimum building setbacks from:</td><td></td></tr> <tr> <td>• Southern Link Road</td><td>20 m</td></tr> <tr> <td>• West-North-South Link Road</td><td>20 m</td></tr> <tr> <td>• Local estate Roads</td><td>7.5 m</td></tr> <tr> <td>• Western site boundary</td><td>40 m</td></tr> <tr> <td>• Southern site boundary</td><td>20 m (excluding parking areas)</td></tr> <tr> <td>Rear boundary setbacks within the estate</td><td>5 m</td></tr> <tr> <td>Side boundary setbacks within the estate</td><td>0 m subject to compliance with fire rating requirements</td></tr> <tr> <td>Height</td><td>15 m</td></tr> <tr> <td>Minimum lot size</td><td>5,000 m²</td></tr> <tr> <td>Minimum frontage</td><td>40 m (excluding cul-de-sacs) 35 m minimum lot width at the building site</td></tr> <tr> <td>Site coverage</td><td>Maximum of 65 per cent (excluding awnings)</td></tr> </table>	Development Aspect	Control	Minimum building setbacks from:		• Southern Link Road	20 m	• West-North-South Link Road	20 m	• Local estate Roads	7.5 m	• Western site boundary	40 m	• Southern site boundary	20 m (excluding parking areas)	Rear boundary setbacks within the estate	5 m	Side boundary setbacks within the estate	0 m subject to compliance with fire rating requirements	Height	15 m	Minimum lot size	5,000 m ²	Minimum frontage	40 m (excluding cul-de-sacs) 35 m minimum lot width at the building site	Site coverage	Maximum of 65 per cent (excluding awnings)	Noted Engineering design and construction certification will ensure this
Development Aspect	Control																										
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Site coverage	Maximum of 65 per cent (excluding awnings)																										
Staging Plan																											
<p>B15. Prior to the commencement of construction of any Stage of the Concept Proposal, the Applicant shall prepare a Staging Plan for the Development, to the satisfaction of the Planning Secretary. The plan shall:</p> <ol style="list-style-type: none"> be prepared in consultation with Council, utility and service providers and other relevant stakeholders; describe how the implementation of the Concept Proposal, would be staged to ensure it is carried out in an orderly and economic way and minimises construction impacts on adjacent sensitive receivers; show the likely sequence of DAs that will be lodged to develop the Site, with the estimated timing for each Stage and identification of any overlapping construction and operational activities; include concept design for the staged delivery of landscaping, focusing on early implementation of screen planting to minimise the visual impact of subsequent development stages; and include conceptual design for the provision of services, utilities and infrastructure to the Site. 	This will be completed by Goodman																										
<p>B16. The Applicant must</p> <ol style="list-style-type: none"> not commence construction of any Stage of the Development until the Staging Plan required by Condition B15 is approved by the Planning Secretary; and implement the most recent version of the Staging Plan approved by the Planning Secretary. 	Noted																										

Condition	Where Addressed in CEMP
<p>B17. The Planning Secretary may require the Applicant to address certain matters identified in the Staging Plan. The Applicant must comply with any such requirements of the Planning Secretary given as part of the Staging Plan approval.</p> <p>Notes</p> <ul style="list-style-type: none"> <i>The Applicant may amend the Staging Plan as desired, with the approval of the Planning Secretary.</i> <i>The Staging Plan is intended to broadly describe the development sequence for the Site and the delivery of infrastructure for all stages. It is not required to provide detailed design for latter Stages.</i> 	Noted
Bushfire Protection	
<p>B20. The Applicant shall ensure the Development complies with:</p> <ol style="list-style-type: none"> the relevant provisions of Planning for Bushfire Protection 2006; the construction standards and asset protection zone requirements recommended in the Oakdale Industrial Estate - West Bushfire Protection Assessment, prepared by Australian Bushfire Protection Planners Pty Ltd, dated September 2016; and AS2419.1 – 2005 Fire Hydrant Installations for fire-fighting water supply. 	Section 4.11
TransGrid Easement	
<p>B21. The Applicant must:</p> <ol style="list-style-type: none"> provide safe and unobstructed access for TransGrid plant and personnel to access the transmission towers, lines and easement on the Site, 24 hours a day, 7 days a week; comply with the requirements of TransGrid for any works in the TransGrid easement; and advise TransGrid of any proposed amended or modified encroachment into the easement. 	Section 4.1
Endeavour Energy	
<p>B22. The Applicant must comply with the requirements of Endeavour Energy for the provision of land for a new zone substation as shown on the plans in the RTS.</p>	Section 4.1
Water NSW	
<p>B23. The Applicant must:</p> <ol style="list-style-type: none"> provide safe and unobstructed access for Water NSW plant and personnel to access the water pipelines corridor adjacent the Site, 24 hours a day, 7 days a week; comply with the requirements of Water NSW for any works adjacent to or over, the water pipelines corridor; and advise Water NSW of any proposed amended or modified encroachment into the water pipelines corridor. 	Section 4.1
Amenities Lot	
<p>B24. The amenities lot located north of Estate Road 1, as shown on the plans in Appendix 1, must only provide for small-scale local services such as commercial, retail, community facilities and landscaping that service or support the needs of local employment-generating uses.</p>	Noted
SCHEDULE D: CONDITIONS FOR STAGE 1	
PART 1 – GENERAL CONDITIONS	
Obligation to Minimise Harm to the Environment	

Condition	Where Addressed in CEMP
D1. In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of Stage 1 development, and any rehabilitation required under this consent.	Section 4.1
Terms of Consent	
D2. Stage 1 of the Development may only be carried out: a) in compliance with the conditions of this consent; b) in accordance with all written directions of the Planning Secretary; c) in accordance with the EIS and RTS; d) in accordance with the plans in Appendix 2 and Appendix 3; and e) in accordance with the Applicant's Management and Mitigation Measures in Appendix 7.	Noted
D4. The conditions of this consent and directions of the Planning Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document listed in Condition D2(c). In the event of an inconsistency, ambiguity or conflict between any of the documents listed in Condition D2(c), the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.	Noted
Limit of Consent	
D5. This consent lapses five (5) years after the date from which it operates, unless Stage 1 has physically commenced on the land to which the consent applies before that date.	Noted
Notification of Commencement	
D8. The date of commencement of each of the following phases of Stage 1 must be notified to the Department in writing, at least one month before that date: a) construction; and b) operation.	Noted
D9. If the construction or operation of Stage 1 is to be delivered in sub-stages, the Department must be notified in writing at least one month before the commencement of each sub-stage, of the date of commencement and the works to be carried out in that sub-stage.	Noted
Evidence of Consultation	
D10. Where conditions of this consent require consultation with an identified party, the Applicant must: a) consult with the relevant party prior to submitting the subject document to the Planning Secretary for approval; and b) provide details of the consultation undertaken including: (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.	Section 1.2.3
Protection of Public Infrastructure	

Condition	Where Addressed in CEMP
<p>D14. Before the commencement of construction of Stage 1, the Applicant must:</p> <ol style="list-style-type: none"> consult with the relevant owner and provider of services that are likely to be affected, to make suitable arrangements for access to, diversion, protection and support of the affected infrastructure; prepare a dilapidation report identifying the condition of all public infrastructure in the vicinity of the Site (including roads, gutters and footpaths); and submit a copy of the dilapidation report to the Planning Secretary and Council. 	Noted. This will be completed by Goodman.
<p>D15. Unless the Applicant and the applicable authority agree otherwise, the Applicant must:</p> <ol style="list-style-type: none"> repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by carrying out Stage 1; and relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of Stage 1. 	Noted
Protection of Water NSW Infrastructure	
<p>D16. Before the commencement of construction of Stage 1, the Applicant must:</p> <ol style="list-style-type: none"> prepare a dilapidation report identifying the condition of all infrastructure within the water pipelines corridor, in the vicinity of the WNSLR bridge crossing; implement all practical measures to protect this infrastructure, as required by Water NSW; and repair, or pay the full costs associated with repairing, any water supply infrastructure that is damaged by carrying out Stage 1. 	Noted
Demolition	
<p>D17. All demolition must be carried out in accordance with <i>Australian Standard AS 2601-2001 The Demolition of Structures</i> (Standards Australia, 2001).</p>	Section 4.1
Structural Adequacy and Certification	
<p>D18. The Applicant shall ensure that:</p> <ol style="list-style-type: none"> all new buildings and structures, and any alterations or additional to existing buildings and structures are constructed in accordance with the relevant requirements of the National Construction Code (NCC). <p>Notes</p> <ul style="list-style-type: none"> <i>Under Part 6 of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works.</i> <i>Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.</i> 	Noted Engineering design and construction certification will ensure this
Compliance	
<p>D19. The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of Stage 1.</p>	Section 3.4
Operation Of Plant And Equipment	

Condition	Where Addressed in CEMP
D21. All plant and equipment used on site, or to monitor the performance of Stage 1 must be: a) maintained in a proper and efficient condition; and b) operated in a proper and efficient manner.	Section 4.1
TransGrid Easement	
D30. The Applicant must: a) provide safe and unobstructed access for TransGrid plant and personnel to access the transmission towers, lines and easement on the Site, 24 hours a day, 7 days a week; b) comply with the requirements of TransGrid for any works in the TransGrid easement on the Site; and c) advise TransGrid of any proposed amended or modified encroachment into the easement.	Section 4.1
Water NSW	
D31. The Applicant must: a) comply with the requirements of Water NSW for any works adjacent to, or over, the water pipelines corridor; b) consult with Water NSW during detailed design of Stage 1 works near the corridor including: (i) design of drainage upgrade works within the corridor; (ii) batters and access tracks; (iii) final bridge design for the WNSLR; c) obtain from Water NSW, an access consent and construction licence to work within the water pipelines corridor, prior to the commencement of construction; d) consult with Water NSW during preparation of the CEMP, in accordance with Condition D119, and attend a site visit with Water NSW personnel, prior to finalising the CEMP, to mark the exact works area for the WNSLR bridge crossing; and e) notify any incidents that affect or could affect the water pipelines corridor to Water NSW on the 24- hour Incident Notification Number 1800 061 069, as a matter of urgency.	Section 1.2.3
Advisory Notes	
AN1. All licences, permits, approvals and consents as required by law must be obtained and maintained as required for Stage 1. No condition of this consent removes any obligation to obtain, renew or comply with such licences, permits, approvals and consents.	Noted
PART 2 – ENVIRONMENTAL PERFORMANCE CONDITIONS	
Visual Amenity	

Condition	Where Addressed in CEMP
<p>Landscape Management Plan</p> <p>D35. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Landscape Management Plan (LMP), to the satisfaction of the Planning Secretary. The plan must form part of the CEMP in accordance with Condition D119 and the OEMP in accordance with Condition D130 and must:</p> <ul style="list-style-type: none"> a) be prepared in consultation with Council; b) detail procedures for the retention of existing native vegetation in the north-western corner of the Site and protection of this vegetation from construction impacts; c) include visual impact mitigation measures for construction including but not limited to: <ul style="list-style-type: none"> (i) the location of site sheds, compounds and machinery parking areas, avoiding the western and southern site boundaries, or other locations highly visible from adjacent residential properties; (ii) procedures for progressive grassing of exposed soil, as soon as reasonably practicable after disturbance, focusing on areas where building construction will occur at a later stage; d) detail the works required to construct the landscape bund along the western boundary of the Site, as shown on Figure 5 in Appendix 2, including provision for the landscaping to incorporate mature trees (no less than 75 litre pot size); e) include a schedule of works which priorities the construction of the landscape bund along the western boundary of the Site, as shown on Figure 5 in Appendix 2; f) include a program for implementing the landscape bund as soon as reasonably practicable, and no later than prior to operation of Stage 1; g) describe the integration of landscaping with fixed elements, including retaining walls and noise walls; and h) describe the monitoring and maintenance procedures to ensure the success of the landscaping works over the life of the Development. 	Section 4.8 and Appendix Q
<p>D36. The Applicant must:</p> <ul style="list-style-type: none"> a) not commence construction of Stage 1 until the LMP is approved by the Planning Secretary. b) must implement the most recent version of the LMP approved by the Planning Secretary; and c) include the monitoring and maintenance procedures contained within the LMP within the OEMP required in accordance with Condition D130. 	Noted
<p>Lighting and Security Cameras</p> <p>D40. The Applicant must ensure the lighting associated with Stage 1:</p> <ul style="list-style-type: none"> a) complies with the latest version of <i>AS 4282-1997 - Control of the obtrusive effects of outdoor lighting</i> (Standards Australia, 1997); and b) is mounted, screened and directed in such a manner that it does not create a nuisance to surrounding properties or the public road network. 	Section 4.8 and Appendix Q
<p>D41. The Applicant must ensure any security cameras installed as part of Stage 1 are directed away from adjacent private properties.</p>	Section 4.8 and Appendix Q
<p>Signage and Fencing</p> <p>D43. All signage and fencing must be erected in accordance with the plans in the RTS.</p> <p>Note: <i>This condition does not apply to temporary construction and safety related signage and fencing.</i></p>	Section 4.1
<p>D44. All fencing along building frontages must be located behind the landscape setbacks and not along the front boundary. The fencing must be a maximum height of 2.1 metre and be an open style.</p>	Section 4.1

Condition	Where Addressed in CEMP
<p>D45. The Applicant must:</p> <ul style="list-style-type: none"> a) remove existing rural fencing along the water pipelines corridor adjacent the site and dispose to an appropriate waste facility licensed to accept the waste; b) install and maintain temporary security fencing along the water pipelines corridor adjacent the site, for the duration of construction; c) install permanent 2.4 metre high fencing along the water pipelines corridor adjacent the site, including the approaches to the WNSLR bridge over the water pipelines corridor and above retaining walls, unless otherwise agreed with Water NSW; d) install concrete barriers or barrier guard rails (including barriers leading up to bridge structure) to the WNSLR where there is potential for large vehicles to drive over retaining walls and into the water pipelines corridor. Barriers must be rated to withstand impact from B-Double size vehicles; and e) install cranked throw screens on both sides of the WNSLR bridge crossing the Water NSW water pipeline corridor. 	Section 4.8
Western North- South Link Road (WNSLR)	
<p>General Requirements</p> <p>D46. The Applicant must design and construct the WNSLR in accordance with the requirements of:</p> <ul style="list-style-type: none"> a) the Council, the PCA and any approval issued under section 138 of the <i>Roads Act 1993</i> including the WAD; b) TfNSW for the bridge crossing of the future WSFL; and c) Water NSW for the bridge crossing of the water pipelines corridor. 	Section 4.1
<p>D47. The Applicant must design and construct the intersections of the WNSLR with Estate Road 1 and Lockwood Road to the satisfaction of the Relevant Roads Authority.</p>	Section 4.1
<p>Pre-Construction</p> <p>D56. Prior to the commencement of construction of the WNSLR, the Applicant must:</p> <ul style="list-style-type: none"> a) obtain the written consent of the Minister for Planning and Public Spaces under the Biodiversity Covenant, to construct the WNSLR over the Erskine Park Biodiversity Corridor; and b) provide evidence to the satisfaction of the Planning Secretary, demonstrating the design of the WNSLR and bridge crossings have been agreed with the Relevant Roads Authority, Council, TfNSW and Water NSW. 	Noted
<p>Consultation</p> <p>D57. The Applicant must develop a schedule for consultation with and approval by TfNSW for the construction of the bridge foundations over the future WSFL, including geotechnical and structural certification as required by TfNSW. The schedule must form part of the CEMP required by Condition D119.</p>	Section 1.2.3 and Appendix B
<p>D58. The Applicant must develop a schedule for consultation with and approval by Water NSW for the construction of the bridge over the water pipelines corridor. This schedule must form part of the CEMP required by Condition D119</p>	Section 1.2.3 and Appendix B
<p>Dedication of Infrastructure and Land</p> <p>D62. Prior to the completion of construction of the WNSLR, the Applicant must consult with Water NSW regarding land subdivision and stratum arrangements for the acquisition and dedication of Water NSW land to Council for the WNSLR bridge.</p>	Section 1.2.3 and Appendix C
<p>D63. Following completion of construction of the WNSLR to the satisfaction of the Relevant Roads Authority, the Applicant must dedicate the WNSLR and its associated land owned by Water NSW and BGMG 11 Pty Limited as trustee for the BGMG 1 Oakdale West Trust, to the Relevant Roads Authority in accordance with the requirements of the Planning Agreement.</p>	Noted

Condition	Where Addressed in CEMP
D64. The Applicant shall retain care, control and ownership of bio-retention basin no. 1 associated with the WNSLR.	Section 4.6
Transport, Access and Parking	
<p>Construction Traffic Management Plan</p> <p>D65. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Construction Traffic Management Plan (CTMP) to the satisfaction of the Planning Secretary. The CTMP must form part of the CEMP required by Condition D111 and must:</p> <ul style="list-style-type: none"> a) be prepared by a suitably qualified and experienced person(s); b) be prepared in consultation with Council, Mamre Anglican School, Emmaus Catholic College, Emmaus Catholic Care Village and Trinity Catholic Primary School; c) detail specific measures to manage construction traffic to avoid school drop off and pick up times (Monday to Friday 8 am – 9.30 am and 2.30 pm – 4 pm and Higher School Certificate exam periods), including any temporary infrastructure arrangements and traffic safety measures; d) detail the measures to be implemented to ensure road safety and network efficiency during construction, including scheduling deliveries of heavy plant and equipment outside of peak periods, or during school holidays where possible; e) detail heavy vehicle routes, access and parking arrangements; f) include a Driver Code of Conduct to: <ul style="list-style-type: none"> (i) minimise the impacts of construction on the local and regional road network; (ii) minimise conflicts with other road users including the students, staff, visitors and residents of the neighbouring schools and aged care village; (iii) minimise road traffic noise, both on Bakers Lane and from construction vehicles on Site; and (iv) ensure truck drivers use specified routes and adhere to the speed restrictions on Bakers Lane; g) include a program to monitor the effectiveness of these measures; and h) detail procedures for early notification to residents and the community (including local schools), of any potential disruptions to routes. 	Section 4.5 and Appendix L
<p>D66 The Applicant must:</p> <ul style="list-style-type: none"> a) not commence construction of Stage 1 until the CTMP required by Condition D65 is approved by the Planning Secretary; and b) implement the most recent version of the CTMP approved by the Planning Secretary for the duration of construction. 	Noted
D67. The Applicant must design and construct the internal estate roads and intersections to accommodate the turning path of a B-Double, to the satisfaction of the Relevant Roads Authority.	Section 4.5 and Appendix L
<p>Estate Roads and Intersections</p> <p>D68. Following the issue of a Subdivision Certificate, the estate roads shall be dedicated to the Relevant Roads Authority. Prior to any dedication, the Applicant shall ensure construction of the estate roads has been completed to the satisfaction of the Relevant Roads Authority and measures (such as a performance bond) are in place for any prescribed maintenance period, to the satisfaction of the Relevant Roads Authority.</p>	Noted
Noise	

Condition	Where Addressed in CEMP											
<p>Hours of work</p> <p>D70. The Applicant must comply with the hours detailed in Table 5, unless otherwise agreed in writing by the Planning Secretary.</p> <p>Table 5: Hours of Work</p> <table><tr><th>Activity</th><th>Day</th><th>Time</th></tr><tr><td rowspan="2">Construction</td><td>Monday – Friday</td><td>7 am to 6 pm</td></tr><tr><td>Saturday</td><td>8 am to 1 pm</td></tr><tr><td>Operation</td><td>Monday – Sunday (including public holidays)</td><td>24 hours</td></tr></table>	Activity	Day	Time	Construction	Monday – Friday	7 am to 6 pm	Saturday	8 am to 1 pm	Operation	Monday – Sunday (including public holidays)	24 hours	Section 4.1
Activity	Day	Time										
Construction	Monday – Friday	7 am to 6 pm										
	Saturday	8 am to 1 pm										
Operation	Monday – Sunday (including public holidays)	24 hours										
<p>D71. Works outside of the hours identified in Condition D70 may be undertaken in the following circumstances:</p> <ul style="list-style-type: none">a) works that are inaudible at the nearest sensitive receivers;b) works agreed to in writing by the Planning Secretary;c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; ord) where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.	Noted											
<p>Construction Noise Limits</p> <p>D72. Stage 1 must be constructed with the aim of achieving the construction noise management levels detailed in the <i>Interim Construction Noise Guideline</i> (DECC, 2009) (as may be updated or replaced from time to time). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the Construction Noise and Vibration Management Plan required by Condition D73</p>	Section 4.2 and Appendix J											
<p>Construction Noise and Vibration Management Plan</p> <p>D73. The Applicant must prepare a Construction Noise and Vibration Management Plan (CNVMP) for Stage 1, to the satisfaction of the Planning Secretary. The CNVMP must form part of a CEMP in accordance with Condition D119 and must</p> <ul style="list-style-type: none">a) be prepared by a suitably qualified and experienced noise expert;b) describe procedures for achieving the noise management levels in EPA’s <i>Interim Construction Noise Guideline</i> (DECC, 2009) (as may be updated or replaced from time to time);c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;d) include strategies to minimise impacts to sensitive receivers, including, where practicable, starting noisy equipment away from sensitive receivers and implementing respite periods;e) include strategies that have been developed with the sensitive receivers identified in Appendix 5 for managing high noise generating works;f) describe the community consultation undertaken to develop the strategies in Condition D73(e);	Section 4.2 and Appendix J											

Condition	Where Addressed in CEMP
g) include a monitoring program that: <ul style="list-style-type: none"> (i) includes a protocol for determining exceedances of the relevant conditions in this approval; (ii) evaluates and reports on the effectiveness of the noise and vibration management measures; (iii) include procedures to relocate, modify, mitigate or stop work to ensure compliance with relevant criteria; and h) include a complaints management system that would be implemented for the duration of Stage 1.	Section 4.2 and Appendix J
D74. The Applicant must: <ul style="list-style-type: none"> a) not commence construction of Stage 1 until the CNVMP required by Condition on D73 is approved by the Planning Secretary; and b) implement the most recent version of the CNVMP approved by the Planning Secretary for the duration of construction. 	Noted
Vibration	
Vibration Criteria D76. Vibration caused by construction works on the site, as measured at any residence or structure outside the site, must be limited to: <ul style="list-style-type: none"> a) for structural damage, the latest version of <i>DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures</i> (German Institute for Standardisation, 1999); and b) for human exposure, the acceptable vibration values set out in the <i>Environmental Noise Management Assessing Vibration: a technical guideline</i> (DEC, 2006) (as may be updated or replaced from time to time). 	Section 4.3 and Appendix J
D77 Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in Condition D76.	Section 4.3 and Appendix J
D78. The limits in Conditions D76 and D77 apply unless otherwise outlined in a CNVMP, approved as part of the CEMP required by Condition D119 of this consent.	Section 4.3 and Appendix J
Soils & Water	
Imported Soil D79. The Applicant must prepare a Fill Importation Protocol for Stage 1. The protocol must form part of the CEMP required by Condition D119 and must detail the measures to: <ul style="list-style-type: none"> a) ensure only VENM, ENM, or other material approved in writing by EPA is brought onto the site; 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. 	Section 4.6 and Appendix O

Condition	Where Addressed in CEMP
<p>Erosion and Sediment Control</p> <p>D80. The Applicant must prepare Erosion and Sediment Control Plans for Stage 1, including the WNSLR, to the satisfaction of the Planning Secretary. The Plans must form part of a CEMP in accordance with Condition D119 and must:</p> <ul style="list-style-type: none"> a) be prepared by a suitably qualified and experienced person(s); b) be generally consistent with the Erosion and Sediment Control Plans in the RTS those prepared by the contractor for each sequence of the works, as approved by the PCA; c) include detailed erosion and sediment controls developed in accordance with the relevant requirements of <i>Managing Urban Stormwater: Soils and Construction - Volume 1: Blue Book</i> (Landcom, 2004) guideline; and d) include procedures for maintaining erosion and sediment controls in efficient working order for the duration of construction, to ensure Stage 1 complies with Condition D82 	Section 4.6 and Appendix M
<p>D81. Prior to the commencement of bulk earthworks as part of Stage 1, the Applicant must implement erosion and sediment controls identified by Condition D80 and maintain those controls throughout bulk earthworks and construction, to ensure stormwater flows do not increase in any downstream areas. The Environmental Representative, appointed in accordance with Condition D123, shall make a written statement to the Planning Secretary confirming the erosion and sediment controls are operational, prior to the commencement of bulk earthworks and other construction activities required for Stage 1.</p>	Section 4.6 and Appendix M
<p>Discharge Limits</p> <p>D82. Stage 1 must comply with section 120 of the POEO Act, which prohibits the pollution of waters.</p>	Section 4.6
<p>Stormwater Management System</p> <p>D83. The Applicant must design, construct and operate a stormwater management system for Stage 1 that:</p> <ul style="list-style-type: none"> a) is designed by a suitably qualified and experienced person(s); b) is generally in accordance with the conceptual design in the RTS; c) is in accordance with applicable Australian Standards; d) ensures the system capacity is designed in accordance with <i>Australian Rainfall and Runoff</i> (Engineers Australia, 2016), <i>Managing Urban Stormwater: Council Handbook</i> (EPA, 1997) and <i>Stormwater Drainage Specifications for Building Development</i> (Penrith Council, May 2018); e) ensures peak stormwater flows from the Site do not exceed pre-development flows in any downstream areas for all rainfall events up to and including the 1 in 100 year average recurrence interval (ARI); f) ensures peak stormwater flows from the Site do not exceed existing flows in the Water NSW drainage lines and water pipelines corridor; and g) achieves the pollutant reduction targets specified in Council's <i>Water Sensitive Urban Design (WSUD) Policy</i> (December 2013). 	Section 4.6
<p>D84. All stormwater drainage infrastructure on the Site, including bio-retention basins, shall remain under the care, control and ownership of the registered proprietor of the lots.</p>	Noted
<p>D85. The Applicant shall create a drainage easement for the outlet swales from the bio-retention basins on the site, in accordance with the requirements of Council and Condition D22.</p>	Section 4.6

Condition	Where Addressed in CEMP
Groundwater D86. If groundwater is intersected during construction of Stage 1, the Applicant must: <ul style="list-style-type: none"> a) obtain the necessary water licences or approvals from NRAR; and b) develop a Groundwater Management Plan (GMP) for the testing, dewatering, storage, movement and treatment of groundwater, to the satisfaction of NRAR. 	Noted
Waterfront Land D87. The Applicant must carry out all works on or adjacent to waterfront land in accordance with the Department of <i>Industry Guidelines for Controlled Activities on Waterfront Lands 2012</i> .	Section 4.1
Biodiversity	
Flora and Fauna Management Plan D88. The Applicant must prepare a Flora and Fauna Management Plan (FFMP) for Stage 1, to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with Condition D119 and must: <ul style="list-style-type: none"> a) be prepared by a suitably qualified and experienced person(s); b) describe procedures to manage impacts on biodiversity values during earthworks, clearing and dam decommissioning; c) include procedures for clearing marking and protecting the areas of vegetation to be retained on the Site, including the mature vegetation in the north-western corner and the Biodiversity Offset Area, established in accordance with Condition D91 adjacent to Ropes Creek; and d) detail the specific erosion and sediment controls to protect the retained vegetation. 	Section 4.8 and Appendix R
D89. The Applicant must: <ul style="list-style-type: none"> a) not commence bulk earthworks until the FFMP required by Condition D88 is approved by the Planning Secretary; and b) implement the most recent version of the FFMP approved by the Planning Secretary for the duration of bulk earthworks and construction. 	Section 4.8
Offsets for the WNSLR D93. Within 12 months of the date of this development consent, or as otherwise agreed with the Planning Secretary, the Applicant must: <ul style="list-style-type: none"> a) offset 0.42 ha of vegetation lost in the Erskine Park Biodiversity Corridor as a result of the WNSLR by carrying out planting within the area shown in green edging Figure 9 of Appendix 6; and b) plant the area shown in green edging on Figure 9 of Appendix 6 with species similar to those identified for zone 4a, on the south-eastern side of Ropes Creek, in the Biodiversity Management Plan Erskine Park Employment Area (HLA-Envirosciences, 2 May 2006). 	Noted
D94. The Applicant shall monitor and maintain the planting for a period of six months to ensure a minimum 85% survival rate of the planting.	Section 4.8
Snake Management Measures D96. Prior to construction of Stage 1, the Applicant must implement snake management measures to limit, to the extent practicable, movement of snakes from the Site into the adjacent school and retirement village on the western boundary of the Site. The measures shall be detailed in the CEMP required by Condition D119 and shall include, but not be limited to, provision of alternative snake habitat on Site, fencing along the western boundary and installation of snake deterrents.	These will be implemented by the Stage 1 contractor and addressed in the Oakdale West CEMP

Condition	Where Addressed in CEMP
Bushfire Protection	
<p>D97. The Applicant shall ensure Stage 1 complies with:</p> <ul style="list-style-type: none"> a) the relevant provisions of <i>Planning for Bushfire Protection 2006</i>; b) the construction standards and asset protection zone requirements recommended in the Oakdale Industrial Estate - West Bushfire Protection Assessment, prepared by Australian Bushfire Protection Planners Pty Ltd, dated September 2016; and c) AS2419.1 – 2005 Fire Hydrant Installations for fire-fighting water supply. 	Section 4.11 and Appendix U
Air Quality	
<p>Dust Minimisation</p> <p>D98. The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.</p>	Section 4.4 and Appendix K
<p>D99. During construction of Stage 1, the Applicant must ensure that:</p> <ul style="list-style-type: none"> a) exposed surfaces and stockpiles are suppressed by regular watering; b) all trucks entering or leaving the Site with loads have their loads covered; c) trucks associated with Stage 1 do not track dirt onto the public road network; d) public roads used by these trucks are kept clean; and e) land stabilisation works are carried out progressively on site to minimise exposed surfaces. 	Section 4.4 and Appendix K
<p>Construction Air Quality Management Plan</p> <p>D100. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Construction Air Quality Management Plan (CAQMP) to the satisfaction of the Planning Secretary. The CAQMP must form part of the CEMP required by Condition D119. The CAQMP must:</p> <ul style="list-style-type: none"> a) be prepared by a suitably qualified and experienced person(s); b) detail and rank all emissions from all construction activities, including particulate emissions; c) describe a program that is capable of evaluating the performance of the construction and determining compliance with key performance indicators; d) identify the control measures that will be implemented for each emission source; and e) nominate the following for each of the proposed controls: <ul style="list-style-type: none"> (i) key performance indicator; (ii) monitoring method; (iii) location, frequency and duration of monitoring; (iv) record keeping; (v) complaints register; (vi) response procedures; and (vii) compliance monitoring. 	Section 4.4 and Appendix K
<p>D101. The Applicant must:</p> <ul style="list-style-type: none"> a) not commence construction of Stage 1 until the CAQMP required by Condition D100 is approved by the Planning Secretary; and b) implement the most recent version of the CAQMP approved by the Planning Secretary for the duration of construction. 	Noted
<p>Odour Management</p> <p>D102. The Applicant must ensure Stage 1 does not cause or permit the emission of any offensive odour, as defined in the POEO Act.</p>	Section 4.4

Condition	Where Addressed in CEMP
Aboriginal Heritage	
Statutory Requirements D103. Prior to the commencement of construction of Stage 1, the Applicant must register identified Aboriginal items or objects on the OEH's Aboriginal Heritage Information Management System (AHIMS) Aboriginal Sites Register.	Section 4.9
Archaeological Test Excavation D104. Prior to the commencement of construction of Stage 1, the Applicant must undertake archaeological test excavation in the identified area of archaeological sensitivity adjacent to Ropes Creek and the ridgeline immediately to the west, that would be impacted by Stage 1. The test excavation must: <ul style="list-style-type: none"> a) be undertaken in accordance with a methodology developed in consultation with registered Aboriginal parties; b) be undertaken in accordance with the requirements of the Heritage and Community Engagement, Department of Premier and Cabinet (former NSW OEH Heritage Division); and c) include a report detailing any further work, including archaeological salvage and monitoring, conducted in the presence of Aboriginal stakeholders. 	Noted. This will be completed by Goodman
D105. The Applicant must not commence construction of Stage 1 until the Archaeological Test Excavation Report is provided to the Heritage and Community Engagement, Department of Premier and Cabinet (former NSW OEH Heritage Division) and the Planning Secretary.	Noted
Unexpected Finds Protocol D106. If any item or object of Aboriginal heritage significance is identified on Site: <ul style="list-style-type: none"> a) all work in the immediate vicinity of the suspected Aboriginal item or object must cease immediately; b) a 10 m wide buffer area around the suspected item or object must be cordoned off; and c) the OEH must be contacted immediately. 	Section 4.9 and Appendix S
D107. Work in the immediate vicinity of the Aboriginal item or object may only recommence in accordance with the provisions of Part 6 of the <i>National Parks and Wildlife Act 1974</i> (NSW).	Section 4.9
Historic Heritage	
Unexpected Finds Protocol D108. If any archaeological relics are uncovered during construction of Stage 1, then all works in the immediate vicinity of the relic must cease immediately. Unexpected finds must be evaluated and recorded in accordance the requirements of Department of Premier and Cabinet, Heritage (OEH NSW Heritage Division).	Section 4.9 and Appendix S
Hazards and Risks	
Dangerous Goods D109. The quantities of dangerous goods stored and handled at the Site must be below the threshold quantities listed in the Department of Planning's <i>Hazardous and Offensive Development Application Guidelines – Applying SEPP 33</i> at all times.	Section 4.10
Bunding D110. The Applicant must store all chemicals, fuels and oils used on Site in appropriately banded areas in accordance with the requirements of all relevant Australian Standards, and/or EPA's <i>Storing and Handling of Liquids: Environmental Protection – Participants Manual</i> (Department of Environment and Climate Change, 2007).	Section 4.10

Condition	Where Addressed in CEMP
Waste Management	
Waste Storage D111. Waste must be secured and maintained within designated waste storage areas at all times and must not leave the Site onto neighbouring public or private properties.	Section 4.7
Waste Management Plan D112. The Applicant must implement the Waste Management Plan (WMP) in the EIS for the duration of construction and operation of Stage 1.	Section 4.7 and Appendix P
Statutory Requirements D113. The Applicant must assess and classify all liquid and non-liquid wastes to be taken off Site in accordance with the latest version of EPA's <i>Waste Classification Guidelines Part 1: Classifying Waste</i> (EPA, 2014) and dispose of all wastes to a facility that may lawfully accept the waste.	Section 4.7
D114. Waste generated outside the Site must not be received at the Site for storage, treatment, processing, reprocessing, or disposal.	Section 4.7
Pests, Vermin and Noxious Weed Management D115. The Applicant must: <ul style="list-style-type: none"> a) implement suitable measures to manage pests, vermin and declared noxious weeds on the Site; and b) inspect the Site on a regular basis to ensure that these measures are working effectively, and that pests, vermin or noxious weeds are not present on Site in sufficient numbers to pose an environmental hazard or cause the loss of amenity in the surrounding area. <p>Note: For the purposes of this condition, noxious weeds are those species subject to an order declared under the Biosecurity Act 2015 (NSW).</p>	Section 4.8
Contamination	
D116. Prior to the commencement of construction of Stage 1, the Applicant must prepare an unexpected finds protocol to ensure that potentially contaminated material is appropriately managed. The procedure must form part of the CEMP in accordance with Condition D119 and must ensure any material identified as contaminated is disposed off Site, with the disposal location and results of testing submitted to the Planning Secretary, prior to its removal from the Site.	Section 4.10 and Appendix T
Community Engagement	
D117. The Applicant must consult with the community regularly throughout Stage 1, including consultation with the nearby sensitive receivers identified in Appendix 5, relevant regulatory authorities, Registered Aboriginal Parties and other interested stakeholders. Community engagement shall be undertaken in accordance with the Community Communication Strategy approved in accordance with Condition C19.	Section 4.12 and Appendix I

Condition	Where Addressed in CEMP
PART 3 – ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING	
Management Plan Requirements	
<p>D118. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:</p> <p>a) details of:</p> <ul style="list-style-type: none"> (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; <p>b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;</p> <p>c) a program to monitor and report on the:</p> <ul style="list-style-type: none"> (i) impacts and environmental performance of Stage 1; and (ii) effectiveness of the management measures set out pursuant to paragraph (b) above; <p>d) 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;</p> <p>e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time;</p> <p>f) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); (ii) complaint; (iii) failure to comply with statutory requirements; and <p>g) a protocol for periodic review of the plan.</p> <p>Note: The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</p>	Section 1.2.1
Construction Environmental Management Plan	
<p>D119. The Applicant must prepare a Construction Environmental Management Plan (CEMP) for Stage 1, including the WNSLR, in accordance with the requirements of Condition D118 and to the satisfaction of the Planning Secretary. The Applicant may prepare separate CEMPs for the Stage 1 works and the WNSLR, addressing all relevant requirements of this consent.</p>	This document
<p>D120. Prior to finalising the CEMP, the Applicant must consult with TfNSW (including the former RMS), Council and Water NSW. The Applicant must also attend a site visit with Water NSW personnel to mark the exact works area for the WNSLR bridge crossing.</p>	Section 1.2.3

Condition	Where Addressed in CEMP
<p>D121. As part of the CEMP required under Condition D119 of this consent, the Applicant must include:</p> <ul style="list-style-type: none"> a) detailed procedures for managing bulk earthworks to avoid adverse water quality impacts on Ropes Creek, including, but not limited to: <ul style="list-style-type: none"> (i) any staging of earthworks to minimise disturbed areas; (ii) limits on the areal extent of earthworks; (iii) progressive grassing of exposed areas, as soon as reasonably practicable, focusing on areas where building construction will occur at a later stage; b) Landscape Management Plan (LMP) (see Condition D35); c) Construction Traffic Management Plan (CTMP)(see Condition D65); d) Consultation Schedule for TfNSW and Water NSW (see Conditions D57 and D58); e) Construction Noise and Vibration Management Plan (CNVMP) (see Condition D73); f) Fill Importation Protocol (see Condition D79) and Erosion and Sediment Control Plan (see Condition D80); g) Flora and Fauna Management Plan (FFMP) (see Condition D88); h) Snake Management Measures (see Condition D96); i) Construction Air Quality Management Plan (CAQMP) (see Condition D100); j) Unexpected Finds Protocol (see Conditions D106 and D108); k) Unexpected Contamination Protocol (see Condition D116); and l) a Community Consultation and Complaints Handling Procedure. 	Section 1.2.1
<p>D122. The Applicant must:</p> <ul style="list-style-type: none"> a) not commence construction of Stage 1 until the CEMP is approved by the Planning Secretary; and b) carry out the construction of Stage 1 in accordance with the CEMP approved by the Planning Secretary and as revised and approved by the Planning Secretary from time to time. 	Noted
Environmental Representative	
D123. The Applicant must engage an Environmental Representative (ER) to oversee construction of Stage 1. Construction of Stage 1 must not commence until an ER has been approved by the Planning Secretary and engaged by the Applicant.	Carle Vincent of ERSED has been engaged as the ER. Carl was endorsed by the DPIE on XXX 2019.
D124. The Planning Secretary's approval of an ER must be sought no later than one month before the commencement of construction of Stage 1, or within another timeframe agreed with the Planning Secretary.	
D125. The proposed ER must be a suitably qualified and experienced person who was not involved in the preparation of the EIS or RTS and is independent from the design and construction personnel for Stage 1.	
D126. The Applicant may engage more than one ER for Stage 1, in which case the functions to be exercised by an ER under the terms of this approval may be carried out by any ER that is approved by the Planning Secretary for the purposes of Stage 1.	

Condition	Where Addressed in CEMP
<p>D127. For the duration of construction of Stage 1, or as agreed with the Planning Secretary, the approved ER must:</p> <ul style="list-style-type: none"> a) receive and respond to communication from the Planning Secretary in relation to the environmental performance of Stage 1; b) consider and inform the Planning Secretary on matters specified in the terms of this consent; c) consider and recommend to the Applicant any improvements that may be made to work practices to avoid or minimise adverse impact to the environment and to the community; d) review the CEMP identified in Condition D119 and any other documents that are identified by the Planning Secretary, to ensure they are consistent with requirements in or under this consent, and if so: <ul style="list-style-type: none"> (i) make a written statement to this effect before submission of such documents to the Planning Secretary (if those documents are required to be approved by the Planning Secretary); or (ii) make a written statement to this effect before the implementation of such documents (if those documents are required to be submitted to the Planning Secretary/Department for information or are not required to be submitted to the Planning Secretary/Department); e) regularly monitor the implementation of the CEMP, and any other documents identified by the Planning Secretary, to ensure implementation is being carried out in accordance with the document and the terms of this consent; f) as may be requested by the Planning Secretary, help plan, attend or undertake audits of Stage 1 commissioned by the Department including scoping audits, programming audits, briefings, and site visits; g) as may be requested by the Planning Secretary, assist the Department in the resolution of community complaints; h) prepare and submit to the Planning Secretary and other relevant regulatory agencies, for information, an Environmental Representative Monthly Report providing the information set out in the Environmental Representative Protocol under the heading "Environmental Representative Monthly Reports." The Environmental Representative Monthly Report must be submitted within seven calendar days following the end of each month for the duration of the ER's engagement, or as otherwise agreed with the Planning Secretary. 	Sections 3.2 and 5
<p>D129. The Applicant must provide the ER with all documentation requested by the ER in order for the ER to perform their functions specified in Condition D142 (including preparation of the ER monthly report), as well as:</p> <ul style="list-style-type: none"> a) the complaints register; and b) a copy of any assessment carried out by the Applicant of whether proposed work is consistent with the consent (which must be provided to the ER before the commencement of the subject work). 	Noted
Revision of Strategies, Plans and Programs	
<p>D133. Within three months of:</p> <ul style="list-style-type: none"> a) the submission of a Compliance Report under Condition D141; b) the submission of an Environmental Representative Monthly Report under Condition D127; c) the submission of an incident report under Condition D135; d) the approval of any modification of the conditions of this consent; or e) the issue of a direction of the Planning Secretary under Condition D2(b) which requires a review, the strategies, plans and programs required under this consent must be reviewed. 	Section 6

Condition	Where Addressed in CEMP
Reporting and Auditing	
Incident Notification, Reporting and Response D135. The Department must be notified in writing to compliance@planning.nsw.gov.au immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one) and set out the location and nature of the incident. Subsequent notification requirements must be given and reports submitted in accordance with the requirements set out in Appendix 8.	Sections 3.5 and 5.2
Non-Compliance Notification D136. The Department must be notified in writing to compliance@planning.nsw.gov.au within seven (7) days after the Applicant becomes aware of any non-compliance.	Sections 3.5 and 5.2
D137. A non-compliance 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 and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.	Noted
D138. A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance	Noted
Compliance Reporting D139. No later than 6 weeks before the date notified for the commencement of construction, a Compliance Monitoring and Reporting Program prepared in accordance with the Compliance Reporting Post Approval Requirements (Department 2018) must be submitted to the Department.	This has been prepared by SLR (2019c).
D140. Compliance Reports of the Development must be carried out in accordance with the Compliance Reporting Post Approval Requirements (Department 2018).	Noted
D141. The Applicant must make each Compliance Report publicly available no later than 60 days after submitting it to the Department and notify the Department in writing at least 7 days before this is done.	Noted
Monitoring and Environmental Audits D142. Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance reporting and independent auditing. <i>Note: For the purposes of this condition, as set out in the EP&A Act, “monitoring” is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an “environmental audit” is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.</i>	Section 5

Condition	Where Addressed in CEMP
Access to Information	
<p>D143. At least 48 hours before the commencement of construction until the completion of all works under this consent, the Applicant must:</p> <p>a) make the following information and documents (as they are obtained or approved) publicly available on its website:</p> <ul style="list-style-type: none"> (i) the documents referred to in Condition D2 of this consent; (ii) all current statutory approvals for the Development; (iii) all approved strategies, plans and programs required under the conditions of this consent; (iv) the proposed staging plans for the Development if the construction, operation or decommissioning of the Development is to be staged; (v) regular reporting on the environmental performance of the Development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent; (vi) a comprehensive summary of the monitoring results of the Development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; (vii) a summary of the current stage and progress of the Development; (viii) contact details to enquire about the Development or to make a complaint; (ix) a complaints register, updated monthly; (x) the Compliance Report of the Development; (xi) audit reports prepared as part of any monitoring or environmental audit of the Development and the Applicant's response to the recommendations in any audit report; (xii) any other matter required by the Planning Secretary; and <p>b) keep such information up to date, to the satisfaction of the Planning Secretary.</p>	Section 5.2

APPENDIX F

G36 Guidelines

Table B G36 Guideline Requirements

Section of G36 Guideline	Requirement	Where Addressed in CEMP
Section 2	General Requirements	Section 4.1
Section 3.1	<p>Preparation and Submission of CEMP</p> <p>Your CEMP must:</p> <ul style="list-style-type: none"> a) include an Environmental Policy that contains a commitment to the principles of Ecologically Sustainable Development as detailed in the <i>Protection of the Environment Administration Act 1991</i> (NSW); b) describe all relevant elements of, and include references to, the CEMS documentation and how these will apply to the Work Under the Contract; c) address all aspects and stages of the Work Under the Contract; and d) incorporate all procedures in the draft CEMP prepared by the Principal. 	<ul style="list-style-type: none"> a) Section 3.1 b) Section 3.1 c) This CEMP d) This table outlines where all requirements are addressed within the CEMP
Section 3.2.1	Environmental Risk Assessment Workshop	This will be undertaken by Robson prior to the commencement of construction and included in the Contractors Environmental Management Plan required by G36
Section 3.2.2	Regulatory Requirements and Compliance	Noted
Section 3.2.3	Environmental Objectives and Targets	Section 1.2.2
Section 3.2.4	Environmental Work Method Statement	This will be undertaken by Robson prior to the commencement of construction
Section 3.3	Resources, responsibilities and authority	<p>Carl Vincent at ERSED has been appointed the Environmental Representative in accordance with Condition D115 – D121 of SSD 7348.</p> <p>Dan Thompson of SLR has been appointed as the Communications and Community Liaison Representative in accordance with Condition C19 of SSD 7348.</p>
Section 3.5	Competence, Training and Awareness	Section 3.4
Section 3.6	Working Hours	Section 2.3
Section 3.7	Communication	Section 3 and 5.2
Section 3.7.1	Liaison with EPA and/or other Government Agencies	Section 3.5
Section 3.7.2	Community Liaison and/or Notification	Section 4.12
Section 3.7.3	Complaints and Enquiries Management	Section 3.6

Section of G36 Guideline	Requirement	Where Addressed in CEMP
Section 3.7.4	Notification to communities and stakeholders	Section 4.12 and 5.2
Section 3.8	Emergency Planning	This will be undertaken by Robson prior to the commencement of construction and included in the Contractors Environmental Management Plan required by G36
Section 3.9	Contractors Monitoring, Inspection and Auditing	Section 5
Section 3.10	Environmental Nonconformities	Section 5.4
Section 3.11	Records of Environmental Activities	Section 5
Section 3.12	Management Review	Section 6
Section 4.1	Soil and Water Management	Section 4.6
Section 4.2	Contaminated Land	Section 4.10
Section 4.3	Spill Prevention and Response	Section 3.5
Section 4.4	Air Quality	Section 4.4
Section 4.5	Fire Safety and Burning Off	Section 4.11
Section 4.6	Noise Control	Section 4.2
Section 4.7	Ground Vibration and Air blast	Section 4.2
Section 4.8	Biodiversity	Section 4.8
Section 4.9	Aboriginal Heritage	Section 4.9
Section 4.10	Non-Aboriginal Heritage	Section 4.9
Section 4.11	Waste Management and Resource Recovery	Section 4.7
Section 4.12	Use of Pesticides	Section 4.8
Section 4.13	Work in Environmentally Sensitive Areas	N/A
Section 4.14	Environmental Incident Notification and Reporting	Section 3.5
Section 4.15	Site Facilities	Section 4.6
Section 4.16	Restoration of Site	Section 4.6
Section 4.17	Materials Tracking Plan	Section 4.6
Section 4.18	Fill Importation Protocol	Section 4.6
Section 5	Principal's Surveillance and Audits	Section 5

APPENDIX G

Incident Event Report

Project Details				
Project name:		Event No.		
Event Type:		Category:		
Date of Event:	Time of Event:	Division for Project		
Details of person who reported the Event (verbally)				
Name:		Position:		
Date of report		Time Reported:		
Lead Investigator details				
Name:		Position:	Date:	
Event Details				
Source of Event:		RCP/Subcontract/Supplier	Ref. No. (if applicable)	
People (details of personnel involved)			Were there any injuries	
			Body part injured:	
Equipment / Materials / Resources (i.e. devices / equipment / procedures / SEWMS / Work Permit (JSEA))			Specific location:	
			Nature of Injury:	
			Mechanism of Injury:	
Work Activity (process / task being undertaken at time of the Event)			Agency of Injury:	
			Was work activity required to stop?	
Work environment (working conditions, site characteristics, locations of and involvement of other plant-people or structures)				
Description of Event (e.g. details of Incident / Event or nonconformance identified - include details of external report / inspection etc. if applicable)				
Immediate actions taken (e.g. notification to management, first aid treatment, controlling the area)				
Classification of Event (applicable to <u>incidents</u> only)				
Class of Event:	Consequence (Actual)	Consequence (Potential)	Statistic:	
Category Actual:				
Category Potential:				
External Reporting - does the Event need to be reported to:		Level of incident investigation required (based on <u>Actual Category</u>)		
Client:	Statutory Authority:	To be based on <u>Actual</u> consequence		
Client acceptance of corrective action:			Name	Signature
Referenced documents (i.e. Witness Statements, other reports, risk assessments, plans, competencies etc.) - include details below				

Investigations into cause of Event to be completed on the next page of this report. Level 2 investigations to be completed using FRM.11403

Page 2 of 3

Name	Position	Signature	Date

APPENDIX H

Complaint Enquiry Form

Project					
Item N°.		Date		Time	
Name of external person					
Address					
Contact No.					
Form of communication	<input type="checkbox"/> Verbal		<input type="checkbox"/> Written		
Details of all complaints and/or enquiries shall be forwarded to the Client where required within the Project Management Plan for the site.					
Correspondence relates to					
<input type="checkbox"/> Dust	<input type="checkbox"/> Noise	<input type="checkbox"/> Traffic	<input type="checkbox"/> Pollution		
<input type="checkbox"/> Access	<input type="checkbox"/> Nuisance	<input type="checkbox"/> Plants or animals	<input type="checkbox"/> Wastes/Litter		
<input type="checkbox"/> Other					
Details of complaint and/or enquiry					
Action taken in response					
Follow up with external person				Date	
Actions taken to avoid repetition of issue					
PMP required to be modified			<input type="checkbox"/> Yes (fill in details below)		<input type="checkbox"/> No

Delegate Name	Signature	Date

APPENDIX I

Community Communications Strategy



COMMUNITY COMMUNICATION STRATEGY OAKDALE WEST ESTATE - CONCEPT AND STAGE 1

Prepared for:

Goodman Property Services (Australia) Pty Ltd

PREPARED BY

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Goodman Property Services (Australia) Pty Ltd (the Client). 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 the Client. 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 SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
660.20005.00000-R01-v5.0	30 October 2019	Kate McKinnon	Samantha Hayes	Dan Thompson
660.20005.00000-R01-v4.0	20 September 2019	Kate McKinnon	Samantha Hayes	Dan Thompson
660.20005.00000-R01-v3.0	1 July 2019	Kate McKinnon	Samantha Hayes	Dan Thompson
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1 Introduction

1.1 Background

This Community Communication Strategy (CCS) has been prepared on behalf of Goodman Property Services (Australia) Pty Ltd (Goodman) for the Oakdale West Estate (OWE) Concept and Stage 1 development (State Significant Development [SSD] application 7348).

This CCS has been prepared in accordance with Condition C19 and supporting conditions within the Development Consent, identifying relevant stakeholders, key issues and the communication methods. Specifically, it details how Goodman and their contractors will engage with relevant stakeholders and the community. The CCS integrates with the Construction Environmental Management Plan (CEMP) and associated suite of documents to provide a comprehensive guide and benchmark for the construction process that aligns with the Development Consent conditions.

1.2 Purpose

The OWE project has been assessed and determined under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The CCS includes the following key aspects:

- Identification of stakeholders to be consulted with during the CCS implementation including adjacent landowners and residents, key stakeholders, relevant agencies and the wider community.
- The tools and actions to be undertaken throughout the construction program to disseminate information to the identified stakeholders, providing opportunities for comment.
- Enquiry and Complaint management protocols.
- Monitoring and feedback mechanisms.

The CCS will be updated as the project progresses to account for variations in the construction program and methodology, along with changes in stakeholder situation that impacts on stakeholder interests, with these articulated through the feedback mechanisms.

SSD 7348 contained the following conditions of relevance to this CCS used to benchmark the contents:

- | | |
|--|--|
| • C19 & C20 – Community Communication Strategy | • D118 - Management Plan Requirements |
| • D37 – Landscaping | • D127 & D128 – Environmental Representative |
| • D71 – Hours of Work | • D133 – Document Review |
| • D117 – Ongoing Community Engagement | • D143 – Access to Information |

The details of these conditions are identified within **Table 1** below, along with a cross reference to the relevant section of this CCS.

The approved development includes the construction of the Western North-South Link Road (WNSLR). This road is to be constructed to Roads and Maritime Service (RMS) specifications, to the satisfaction of Penrith City Council (as the Nominated Road Authority). Details of these specifications as they relate to community consultation and communication are identified within **Table 2**, including cross reference to the relevant section of this CCS.

Table 1 Relevant Conditions of Consent

Condition Number	Condition Detail	Report Reference
C19 – Community Communication Strategy	<p>No later than one month before the commencement of construction of any stage of the Development, a Community Communication Strategy (CCS) must be prepared and submitted to the Planning Secretary for approval. The CCS is to provide mechanisms to facilitate communication between the Applicant, Council and the community (including adjoining affected landowners, schools, businesses, and others directly impacted by Stage 1), during design, construction and operation. The CCS must:</p> <ul style="list-style-type: none"> a) assign a central contact person to keep the nearby sensitive receivers regularly informed throughout the Development; b) detail the mechanisms for regularly consulting with the local community throughout the Development, such as holding regular meetings to inform the community of the progress of the development and report on environmental monitoring results; c) detail a procedure for consulting with nearby sensitive receivers to schedule high noise generating works, vibration intensive activities or manage traffic disruptions; d) include contact details for key community groups, relevant regulatory authorities, Registered Aboriginal Parties and other interested stakeholders; and e) include a complaints procedure for recording, responding to and managing complaints, including: <ul style="list-style-type: none"> i. email, contact telephone number and postal addresses for receiving complaints; ii. advertising the contact details for complaints before and during operation, via the local newspaper and through onsite signage; iii. a complaint register to record the date, time and nature of the complaint, details of the complainant and any actions taken to address the complaint; and iv. procedures for the resolution of any disputes that may arise during the course of the Development. 	<p>This CCS Document</p> <ul style="list-style-type: none"> a) Section 4 b) Section 5 c) Sections 5 & 6 d) Section 2.2 e) Section 5.4
C20 – Community Communication Strategy	<p>The Applicant must:</p> <ul style="list-style-type: none"> a) not commence construction of the relevant stage of the Concept Proposal until the CCS required under Condition C19 has been approved by the Planning Secretary; and b) implement the CCS for each stage of the Concept Proposal and following the completion of operation of the Development. 	<ul style="list-style-type: none"> a) Section 1.2 b) Sections 5 & 6
D37 – Landscaping	<p>The Applicant must complete the landscape bund along the western boundary of the Site as shown on Figure 5 in Appendix 2 within six months of commencing any construction including bulk earthworks.</p>	<p>Section 2.2.1 Appendix A</p>

Condition Number	Condition Detail	Report Reference
D71 – Hours of Work	<p>Works outside of the hours identified in Condition D70 may be undertaken in the following circumstances:</p> <ul style="list-style-type: none"> (a) works that are inaudible at the nearest sensitive receivers; (b) works agreed to in writing by the Planning 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 or to prevent environmental harm. 	Section 5.3.2
D117 – Ongoing Community Engagement	The Applicant must consult with the community regularly throughout Stage 1, including consultation with the nearby sensitive receivers identified in Appendix 5, relevant regulatory authorities, Registered Aboriginal Parties and other interested stakeholders. Community engagement shall be undertaken in accordance with the Community Communication Strategy approved in accordance with Condition C19.	Sections 5 & 6
D118 – Management Plan Requirements	<p>Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:</p> <ul style="list-style-type: none"> a) details of: <ul style="list-style-type: none"> i. the relevant statutory requirements (including any relevant approval, licence or lease conditions); ii. any relevant limits or performance measures and criteria; and iii. the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria; c) a program to monitor and report on the: <ul style="list-style-type: none"> i. impacts and environmental performance of Stage 1; and ii. effectiveness of the management measures set out pursuant to paragraph (b) above; d) 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; e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time; f) a protocol for managing and reporting any: <ul style="list-style-type: none"> i. incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); ii. complaint; iii. failure to comply with statutory requirements; and g) a protocol for periodic review of the plan. <p>Note: The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</p>	<ul style="list-style-type: none"> a) Refer to Project CEMPs (SLR, 2019a & SLR 2019b) b) Sections 3.2, 5.3 and 5.4 c) Section 6 d) Section 5.4.4 e) Section 6 f) Section 5.4 g) Section 6

Condition Number	Condition Detail	Report Reference
D127 - Environmental Representative	<p>For the duration of construction of Stage 1, or as agreed with the Planning Secretary, the approved ER must:</p> <ul style="list-style-type: none"> (a) receive and respond to communication from the Planning Secretary in relation to the environmental performance of Stage 1; (b) consider and inform the Planning Secretary on matters specified in the terms of this consent; (c) consider and recommend to the Applicant any improvements that may be made to work practices to avoid or minimise adverse impact to the environment and to the community; (d) review the CEMP identified in Condition D119 and any other documents that are identified by the Planning Secretary, to ensure they are consistent with requirements in or under this consent, and if so: <ul style="list-style-type: none"> (i) make a written statement to this effect before submission of such documents to the Planning Secretary (if those documents are required to be approved by the Planning Secretary); or (ii) make a written statement to this effect before the implementation of such documents (if those documents are required to be submitted to the Planning Secretary/Department for information or are not required to be submitted to the Planning Secretary/Department); (e) regularly monitor the implementation of the CEMP, and any other documents identified by the Planning Secretary, to ensure implementation is being carried out in accordance with the document and the terms of this consent; (f) as may be requested by the Planning Secretary, help plan, attend or undertake audits of Stage 1 commissioned by the Department including scoping audits, programming audits, briefings, and site visits; (g) as may be requested by the Planning Secretary, assist the Department in the resolution of community complaints; (h) prepare and submit to the Planning Secretary and other relevant regulatory agencies, for information, an Environmental Representative Monthly Report providing the information set out in the Environmental Representative Protocol under the heading "Environmental Representative Monthly Reports." The Environmental Representative Monthly Report must be submitted within seven calendar days following the end of each month for the duration of the ER's engagement, or as otherwise agreed with the Planning Secretary. 	Section 6.2
D128 - Environmental Representative	<p>The Applicant must provide the ER with all documentation requested by the ER in order for the ER to perform their functions specified in Condition D127 (including preparation of the ER monthly report), as well as:</p> <ul style="list-style-type: none"> (a) the complaints register; and (b) a copy of any assessment carried out by the Applicant of whether proposed work is consistent with the consent (which must be provided to the ER before the commencement of the subject work). 	Section 6.2

Condition Number	Condition Detail	Report Reference
D133 Revision of Strategies, Plans and Programs	<p>Within three months of:</p> <p>(a) the submission of a Compliance Report under Condition D141;</p> <p>(b) the submission of an Environmental Representative Monthly Report under Condition D127;</p> <p>(c) the submission of an incident report under Condition D135;</p> <p>(d) the approval of any modification of the conditions of this consent;</p> <p>or</p> <p>(e) the issue of a direction of the Planning Secretary under Condition D2(b) which requires a review the strategies, plans and programs required under this consent must be reviewed.</p>	Section 6.2
D143 – Access to Information	<p>At least 48 hours before the commencement of construction until the completion of all works under this consent, the Applicant must:</p> <p>a) make the following information and documents (as they are obtained or approved) publicly available on its website:</p> <ol style="list-style-type: none"> the documents referred to in Condition D2 of this consent; all current statutory approvals for the Development; all approved strategies, plans and programs required under the conditions of this consent; the proposed staging plans for the Development if the construction, operation or decommissioning of the Development is to be staged; regular reporting on the environmental performance of the Development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent; a comprehensive summary of the monitoring results of the Development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; a summary of the current stage and progress of the Development; contact details to enquire about the Development or to make a complaint; a complaint register, updated monthly; the Compliance Report of the Development; audit reports prepared as part of any monitoring or environmental audit of the Development and the Applicant's response to the recommendations in any audit report; any other matter required by the Planning Secretary; and <p>b) keep such information up to date, to the satisfaction of the Planning Secretary.</p>	Section 5.3.1

It is a requirement of the RMS that communications and community liaison are undertaken in accordance with the RMS QA Specification G36 – Environmental Protection. All relevant requirements within the specification are included in **Table 2** below.

Table 2 Relevant RMS Specifications

Specification Number	Relevant Specification Detail	Report Reference
3.3 - Resources, Responsibilities and Authority	<p>Communications and Community Liaison Representative</p> <p>Appoint a Communications and Community Liaison Representative (CCLR) to lead and manage the community involvement activities, including liaison with property owners and key stakeholders. This person is your representative for the requirements of RMS G36 Clause 3.7.</p> <p>The CCLR must have relevant qualifications with a minimum of 5 years' communications and community liaison experience, preferably in infrastructure development and delivery. The CCLR must be flexible and willing to work outside of normal working hours when required, such as nights and weekends. The CCLR is to be the primary daily contact to the public handling of enquiries/complaints management/interface issues.</p> <p>The CCLR must be available for contact by local residents and the community at all reasonable times to answer any questions and to address any concerns in relation to your construction activities. The CCLR must have up-to-date information on:</p> <ul style="list-style-type: none"> emerging stakeholders; planned construction activities; planned traffic arrangements, including any temporary traffic switches; current landowner discussions with members of your staff; planned community and stakeholder consultations; complaints or enquiries received; duties and accountabilities of your staff; and, commitments to stakeholders made by you or Goodman. <p>The CCLR is to handle document management administration and systems/contact database management and maintenance. The CCLR is to liaise with property owners to co-ordinate access and to deal with specific property related issues arising from the upgrade works. The CCLR is to lead in the development and delivery of communication and community engagement strategies and plans.</p> <p>The CCLR is to facilitate meetings, forums and arranging interviews to address concerns from community.</p> <p>The CCLR is to provide advice and participate with the project teams to improve and enhance the delivery of communication services to the community. The CCLR is to build, maintain collaborative and consultative working relationships with internal and external stakeholders.</p> <p>The CCLR is to possess excellent writing and digital media skills including writing and editing copy for printed and electronic material, internal and external materials such as letters, web brochures and public facing reports, and video and photography for promotional use, etc. The CCLR is to possess a current motor vehicle driver's licence.</p> <p>The CCLR must be available for contact by local residents, key stakeholders and community representatives to answer queries and provide more information or feedback.</p>	Section 4

Specification Number	Relevant Specification Detail	Report Reference
3.7 - Communications	<p>Describe in the CEMP the processes for external and internal communication in relation to the environmental aspects of the work under the Contract.</p> <p>Make all staff and subcontractors working on the Site aware of these external and internal communications procedures and ensure they are properly trained in their application.</p>	<p>Refer to Project CEMPs (SLR, 2019a & SLR 2019b)</p> <p>Section 5.3</p>
3.7.1 - Liaison with EPA and/ or other Government Agencies	<p>The CEMP must identify at least two persons (together with their contact telephone numbers) who will be available to be contacted by the EPA and/ or Other Government Agencies on a 24 hour basis and who have authority to take immediate action to shut down any activity, or to effect any pollution control measure, as directed by an authorised officer of the EPA and/ or Other Government Agencies.</p> <p>Immediately notify Goodman of any visit to the Site by the EPA and/ or Other Government Agencies. Prepare a report for each occasion when the Site is visited by the EPA and/ or Other Government Agencies, notifying Goodman of the purpose and outcome of the EPA and/ or Other Government Agencies visit, and of all actions taken by you in response to the EPA and/ or Other Government Agencies visit. Submit this report to Goodman within one working day of the EPA and/ or Other Government Agencies site visit.</p>	Section 4
<p>3.7.2 - Community Liaison and/or Notification</p> <p>3.7.2.1 New or Changed Construction Activities</p>	<p>Notify local residents and other stakeholders about any new or changed construction activities including changes to bus stop locations and / or timetables which will affect access to their properties/ premises at least five 5 working days before commencing work affecting residents.</p> <p>Such notification must state the nature of the work, why it is necessary, the expected duration, details of any changes to the traffic arrangements or property access and the name and 24 hour contact telephone number of your representative who can respond to any resident/stakeholder concerns.</p> <p>Address any concerns raised by residents in accordance with the complaints procedure as required under Clause 3.7.3 and in accordance with any licence or approval held by you.</p>	Section 5.3.2
3.7.2.2 - Extended Working Hours – No Environmental Protection Licence	<p>Following approval from Goodman on each instance to extend working hours, inform affected residents by letter of the location, nature, scope and duration of the proposed work outside normal working hours, not less than 1 week and not more than 2 weeks, before commencing such work.</p> <p>Include the name and contact telephone number of your representative so that residents can contact him over any concerns about extended working hours and any other information required by any licence or approval held by you.</p> <p>Refer to Practice Note vii of RMS publication “Environmental Noise Management Manual” when preparing the letter and notifying the affected residents.</p>	Section 5.3.2

Specification Number	Relevant Specification Detail	Report Reference
3.7.3 - Complaints and Enquiries Management	<p>As part of your CEMP, prepare and implement a Construction Complaints and Enquiries Management procedure prior to the commencement of construction. You must follow the Construction Complaints and Enquiries Management procedure for the duration of construction. You must ensure your Construction Complaints and Enquiries Management procedure is consistent with AS 4269 "Complaints Handling". This must include:</p> <ul style="list-style-type: none"> a) an advertised 24 hour contact telephone number listed with a telephone company and include a contact name; b) a postal address to which written complaints and enquiries can be sent; c) an email address to which electronic complaints and enquiries can be sent; d) a procedure to receive, record, track and respond to complaints and enquiries within a specified timeframe. When a complaint or enquiry cannot be responded to immediately, a follow-up verbal response on what action is proposed must be provided to the complainant/enquirer within two hours during night-time works and 24 hours at other times; e) a process for the provision of a written response to the complainant/enquirer within ten (10) days, if the complaint or enquiry cannot be resolved by the initial or follow-up verbal response; f) a mediation system for complaints unresolved through the above system. <p>Within one working day of receiving a complaint about any environmental or other issue which has the capacity to damage Goodman's reputation, including any pollution incidents, arising from the Work Under the Contract, submit a written report to Goodman detailing the complaint and the action taken to remedy the problem. A final report together with your proposed measures to prevent the recurrence of such incidents must be submitted to Goodman within 5 working days.</p> <p>Keep a register of all complaints or enquiries, which must include the following details:</p> <ul style="list-style-type: none"> (a) date and time of complaint or enquiry; (b) method by which the complaint or enquiry was made (telephone, letter, meeting, etc); (c) name, address, contact telephone number of complainant (if no such details were provided, a note to that effect); (d) nature of complaint or enquiry; (e) action taken in response including follow up contact with the complainant.; (f) any monitoring to confirm that the complaint or enquiry has been satisfactorily resolved; (g) if no action was taken, the reasons why no action was taken by you. 	Section 5.4

Specification Number	Relevant Specification Detail	Report Reference																				
3.7.4 - Notification to communities and stakeholders	Notify Goodman in advance of the following construction activities:	Sections 5.3.2																				
	<table><tr><th>Activity</th><th>Notification required</th></tr><tr><td>Work at night (any time between 6pm and 7am)</td><td>2 weeks where possible, a minimum of 1 week</td></tr><tr><td>Work on weekends (including public holidays)</td><td>2 weeks where possible, a minimum of 1 week</td></tr><tr><td>Major changes to configuration of road traffic</td><td>At least 4 weeks</td></tr><tr><td>Impacts on pedestrians and/or bicyclists</td><td>At least 4 weeks</td></tr><tr><td>Commencement, rescheduling or completion of key construction activities</td><td>At least 4 weeks for commencement and completion, 24 hours' notice for rescheduling</td></tr><tr><td>Commencement or rescheduling of property adjustment work</td><td>At least 2 weeks (4 weeks for businesses)</td></tr><tr><td>Alteration to property access arrangements</td><td>At least 4 weeks</td></tr><tr><td>Other activities not identified above which may impact on the community stakeholders</td><td>At least 24 hours</td></tr><tr><td>Any form of community protest on site</td><td>Immediately</td></tr></table>		Activity	Notification required	Work at night (any time between 6pm and 7am)	2 weeks where possible, a minimum of 1 week	Work on weekends (including public holidays)	2 weeks where possible, a minimum of 1 week	Major changes to configuration of road traffic	At least 4 weeks	Impacts on pedestrians and/or bicyclists	At least 4 weeks	Commencement, rescheduling or completion of key construction activities	At least 4 weeks for commencement and completion, 24 hours' notice for rescheduling	Commencement or rescheduling of property adjustment work	At least 2 weeks (4 weeks for businesses)	Alteration to property access arrangements	At least 4 weeks	Other activities not identified above which may impact on the community stakeholders	At least 24 hours	Any form of community protest on site	Immediately
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	Major changes to configuration of road traffic		At least 4 weeks																			
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	Alteration to property access arrangements		At least 4 weeks																			
	Other activities not identified above which may impact on the community stakeholders		At least 24 hours																			
	Any form of community protest on site		Immediately																			
	In your communications with the community, you must comply with the requirements of the Privacy and Personal Information Protection Act 1998 (NSW).																					
	You must not make any undertakings on behalf of Goodman without the prior written approval of Goodman. Comply with the distribution for various notification types as follow:																					
	<table><tr><th>Notification Type</th><th>Submission to Goodman</th><th>Distribution</th></tr><tr><td>Out of Hours Works / Night Works (refer to clause 3.7.2.3)</td><td>Draft a notification letter at least 24 hours prior to the works being carried out</td><td>2 weeks where possible, a minimum of 1 week prior to the works being carried out</td></tr><tr><td>Traffic Conditions</td><td>Draft letter at least 4 weeks prior to the traffic conditions changing</td><td>At least 5 business days prior to the traffic conditions changing if deemed necessary by Goodman</td></tr><tr><td>Individual private properties regarding property adjustments or changes to access (refer to clause 3.7.2.1)</td><td>Draft letter at least 4 weeks prior to the works being carried out</td><td>At least 2 weeks prior to the works being carried out of access changes</td></tr></table>		Notification Type	Submission to Goodman	Distribution	Out of Hours Works / Night Works (refer to clause 3.7.2.3)	Draft a notification letter at least 24 hours prior to the works being carried out	2 weeks where possible, a minimum of 1 week prior to the works being carried out	Traffic Conditions	Draft letter at least 4 weeks prior to the traffic conditions changing	At least 5 business days prior to the traffic conditions changing if deemed necessary by Goodman	Individual private properties regarding property adjustments or changes to access (refer to clause 3.7.2.1)	Draft letter at least 4 weeks prior to the works being carried out	At least 2 weeks prior to the works being carried out of access changes								
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Specification Number	Relevant Specification Detail			Report Reference
	Access for bridgeworks over the Water NSW pipelines	Final draft of notification at least 4 weeks prior to be works being carried out	At least 4 weeks prior to the works being carried out	
	Individual businesses regarding property adjustments or changes to access (refer to clause 3.7.2.1)	Draft letter at least 4 weeks prior to the works being carried out	At least 4 weeks prior to the works being carried out of access changes	

1.3 Community Communications Strategy Scope

The CCS applies to works undertaken by Goodman and their engaged contractors. The project comprises two components with separate contractors engaged for each:

- Bulk earthworks across the site, civil infrastructure and landscaping; and construction of warehousing within Precinct 1 (Stage 1).
- Construction of the WNSLR including a signalised intersection with Lenore Drive, roundabout with Lockwood Road and roundabout with the new internal Estate Road No. 1, earthworks, civil works, utility works, property adjustments and landscaping. A haul road will be constructed through Oakdale West (referred to as the Construction Access Road) as part of the WNSLR construction to provide access to the WNSLR corridor.

The CCS applies to both components of the project. Separate CEMPs have been prepared to address each component of the project with both CEMPs referencing and this CCS. Both components will be serviced by the same project website and phone number to provide a simplified and consistent communications process across the project.

1.4 Project Description

The project as described by the SSD 7348 consent comprises:

The Staged Development Application for the Oakdale West Estate, comprising:

A Concept Proposal including:

- *Concept layout of 22 warehouse buildings providing 453,000 square metres of gross floor area and ancillary offices, built over five development stages*
- *Concept layout of development lots, internal roads, drainage, landscaping and biodiversity offsets*
- *Development controls*

A Stage 1 Development Application including:

- *Bulk earthworks across all five stages including retaining walls and noise walls*
- *Construction and operation of three warehouse buildings in Precinct 1 (1A, 1B and 1C) providing 111,000 square metres of gross floor area and ancillary offices*
- *West-North-South Link Road and associated subdivision*
- *Estate roads 1, 2, 6 and the eastern part of road 7*
- *Service infrastructure to Precinct 1, including drainage, power, sewer, water and telecommunications*
- *Landscaping of Stage 1, the western site boundary, West-North-South Link Road, estate roads 1, 2, 6 and the eastern part of road 7 and detention basins*
- *Subdivision of Stage 1 lots and road infrastructure*
- *Stormwater drainage infrastructure for Lots 2A and 2B.*

Further project details are located in the Environmental Impact Statement, Oakdale West Estate, State Significant Development Application (EIS) (Urbis, 2017).

The site works will be undertaken by two contractors, with specific areas of responsibility. Areas of responsibility comprise the bulk earth works, civil infrastructure and services, along with the Stage 1 built form development. A second contractor is engaged for the WNSLR connection north to Lenore Drive and haul road civil works through to the south west corner of the site.

Figure 1 below identifies the site layout, inclusive of both the Stage 1 works and WNSLR. Note, the figure is orientated with south upwards to allow the inclusion of a wider extent of the road network.

The project involves construction activities including:

- Site establishment.
- Clearing and stripping.
- Site construction access.
- Demolition of existing buildings.
- Sediment erosion control works.
- Bulk earthworks and haulage of materials.
- Signage and fencing.
- Construction of civil infrastructure including access roads, bridge, drainage, retaining walls and utilities.
- Building construction and landscaping within Stage 1.

Figure 1 Site Layout Inclusive of the WNSLR

Source: SBA Architects

2 Stakeholder Identification

2.1 Community Overview

The site comprises historic agricultural land identified within the Western Sydney Employment Area (WSEA). The site is located across two Australian Bureau of Statistics (ABS) geographical boundaries, with Erskine Park to the north and Kemps Creek to the south. The ABS data below has been used to inform the communications methodology, with appropriate media and language used to reflect the statistical data.

2.1.1 Erskine Park

Erskine Park has a population of 6,436 accommodated in 2,016 dwellings. The median age is 34 compared to a State median of 38. The top ancestry response is Australian, followed by English, Irish, Scottish then Filipino, with languages other than English spoken at home comprising Arabic (2.6%), Tagalog (2.4%), Filipino (1.4%), then Hindi (1.2%).

17.7% of the Erskine Park population completed Year 12 compared to 15.3% for the State, with 66% of the population employed full time compared to a State average of 59.2%. Management comprised the highest percentage of employment, equating to 19.5%, with a median weekly income of \$781, compared to \$664 for the State.

2.1.2 Kemps Creek

Kemps Creek has a population of 2,268 accommodated in 700 dwellings. The median age is 41 compared to a State median of 38. The top ancestry response is Italian, followed by Australian, English, Lebanese then Maltese, with languages other than English spoken at home comprising Italian (10.1%), Arabic (6.4%), Cantonese (4.3%), then Assyrian Neo-Aramaic (3%).

14.2% of the Kemps Creek population completed Year 12 compared to 15.3% for the State, with 58.4% of the population employed full time compared to a State average of 59.2%. Clerical and Administrative Workers comprised the highest percentage of employment, equating to 20%, with a median weekly income of \$588, compared to \$664 for the State.

2.2 Key Stakeholders

The site is located in close proximity to sensitive receivers to the west comprising a Catholic School, Anglican School and Age Care facility, along with a number of dwellings to the south. The northern and eastern boundaries comprise environmental corridors and infrastructure. Goodman and their representatives carried out extensive consultation with the community and stakeholders during the development of the EIS (Urbis, 2017). Previously identified stakeholders are categorised in **Table 3** below.

Table 3 Key Stakeholders

Stakeholder Agency/Authority	Interests/Issues
Directly affected stakeholders	<p>Adjacent and directly affected properties, businesses and schools including:</p> <ul style="list-style-type: none"> • Residential property – 20 Aldington Road • Emmaus Catholic College • Trinity Catholic Primary School • Emmaus Retirement Village • Mamre Anglican School • Catholic Healthcare Emmaus Village • Little Smarties Early Learning Centre
Local Councils	<ul style="list-style-type: none"> • Penrith City Council
State Government Departments and Offices	<ul style="list-style-type: none"> • NSW EPA • NSW Heritage Office • NSW Biodiversity and Conservation Division, Department of Planning Industry and Environment • NSW Department of Industry • Roads and Maritime Service • Transport for NSW • NSW Rural Fire Service • WaterNSW • National Resources Asset Regulator
Utility and Service Providers	<ul style="list-style-type: none"> • TransGrid • Endeavour Energy • WaterNSW • Sydney Water • Jemena • NBN • Telstra
Other Interested Parties	<ul style="list-style-type: none"> • Registered Aboriginal Parties

Contact details for the key stakeholders listed in **Table 3** above are included in **Appendix B & C**.

2.2.1 Properties receiving adjustments or architectural treatment and mitigating works

It is proposed to provide window glazing treatments to assist in acoustic attenuation to dwellings located at 20 Aldington Road, Kemps Creek.

A landscape bund is to be formed along the Western boundary of the development site to create an acoustic barrier to properties to the West. The location of the landscape bund is shown at **Appendix A**. The landscape bund shall be completed within 6 months of the commencement of any construction work, including bulk earthworks.

3 Key Issues Affecting Stakeholders

3.1 Previous Consultation

Goodman and their representatives have previously undertaken consultation with the community and stakeholders during the development of the project. Details of this consultation were included in the EIS (Urbis, 2017).

A total of 15 submissions were received, including one submission from a Local Council, three submissions from utilities providers, nine submissions from government authorities and two submissions from nearby properties and businesses. In response to the issues raised, Goodman revised several plans and consultant reports, which informed a Response to Submissions Report (Urbis, 2018a).

A further 10 submissions following these revisions were received and further modification to proposed plans and consultant reports were made, with a Supplementary Response to Submissions Report (Supplementary RTS) (Urbis, 2018b) prepared to the satisfaction of the determining authority.

For more information, refer to the Department of Planning and Environment's Major Project Assessments webpage at:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7348v

3.2 Potential Issues and Strategies

Goodman are committed to ongoing proactive consultation with the community and stakeholders while understanding the importance of addressing potential issues and minimising construction related impacts. **Table 4** outlines project issues that are likely or known to be of interest or concern to the community and stakeholders. The table also details communications related measures and strategies that Goodman will undertake to manage and mitigate impacts. The CEMP identifies management and mitigation measures to address those matters extending beyond consultation.

Table 4 Issue Identification and Mitigation

Potential Issue	Potential Key Impacts	Mitigation Strategy
Noise, Vibration and Dust	Truck, machinery and light vehicle movements within, to and from the site, along with civil works have potential to result in negative impacts associated with noise, vibration and dust.	<p>Sensitive receivers and affected stakeholders will be consulted prior to actions likely to generate high levels of noise or vibration in accordance with Section 5.4.2 of this strategy.</p> <p>Up to date information on current and proposed works will be accessible to stakeholders and the wider public on the project web page.</p> <p>Additionally, should any works be likely to generate impacts beyond those identified within the approval's documentation consultation would be undertaken with the applicable managing agency.</p> <p>The CEMP, along with the supporting Dust, Noise and Vibration management plans contain specific measures to manage these impacts. These management plans have been informed by commitments contained within the SSD approvals package, EPA standards and guidelines.</p>
Stormwater, Sediment Control, Erosion, Water Quality	<p>High rainfall events could result in localised flooding.</p> <p>Construction could result in impacts to local water quality, associated with sediment laden runoff.</p>	<p>Surrounding sensitive receivers will be consulted with in relation to adjacent works regarding flooding and water quality issues, with these items discussed at regular meetings, or as they arise via the construction hotline, in accordance with Section 5.4.2 of this Strategy.</p> <p>The CEMP, along with the supporting Soil and Water Management Plan and Water Quality Monitoring Program identify specific mechanisms to manage and mitigate these impacts in accordance with the relevant Penrith City Council standards and commitments within the SSD approvals package.</p>
Construction Traffic	A temporary increase in traffic movements may be experienced associated with the import of fill material, the movement of construction machinery to and from the site and the movement of workers light vehicles.	<p>Sensitive receivers will be notified prior to actions likely to cause traffic disruption in accordance with Section 5.4.2 of this strategy.</p> <p>The CEMP and supporting Construction Traffic Management Plan and Fill Importation Plan identify specific mechanisms to manage and mitigate these impacts.</p>

Potential Issue	Potential Key Impacts	Mitigation Strategy
Local Infrastructure, Utilities and Services	Temporary interruption to existing services including surrounding roads may be required to allow for road connections and the extension of services to the site.	Affected receivers would be notified of possible service disruption via letter box drop and regular meetings, with these disruptions minimised where possible through implementation of the designs identified within the SSD approvals package, measures identified within the CEMP and subsequent engagement with utility providers.
Visual Amenity and Privacy	Visual impacts of earthwork and construction activities, along with potential impacts on the privacy of adjacent sensitive receivers.	Potentially affected receivers would be advised of works with the potential for impact via letter box drop and with these items discussed at regular meetings, or as they arise via the construction hotline, in accordance with Section 5.4.2 of this Strategy. The CEMP identifies specific mechanisms to manage and mitigate these impacts.
Removal of Flora and Fauna	The project approval requires the removal of native and exotic flora and fauna to facilitate the development, with the associated potential for impacts on safety of immediately adjacent receivers, along with biodiversity and visual amenity.	Potentially affected receivers are likely to comprise those receivers immediately adjacent, who are to be advised of works with the potential for impact via letter box drop and regular meetings, or as they arise via the construction hotline, in accordance with Section 5.4.2 of this Strategy. The CEMP, along with the supporting Flora and Fauna Management Plan identify specific mechanisms to manage and mitigate these impacts.
Out of Hours Work	The identified impacts could be magnified due to the works being carried out while surrounding receivers are more likely to be home in the early morning/evening, or asleep, with correspondingly lower background noise levels.	Out of hours works to only be undertaken where necessary and subject to endorsement from the applicable managing agency. Should out of hours work with the potential for impact be proposed the potentially affected receivers would be advised via letter box drop and/ or regular meetings in accordance with Section 5.4.2 of this Strategy.
Aboriginal Heritage	There is the potential for encountering items of Aboriginal Heritage during excavation.	Monitoring of works by appropriately qualified personnel, along with the implementation of an unexpected finds protocol in consultation with Aboriginal Stakeholders and Heritage Division of the Department of Planning, Industry and Environment would be put in place, as discussed within Section 5.4.2 of this document. The CEMP, along with the supporting Unexpected Finds Protocol (Heritage) identify specific mechanisms to manage and mitigate these impacts. .

Potential Issue	Potential Key Impacts	Mitigation Strategy
Misinformation and Misunderstanding	<p>Lack of project awareness within the wider community may result in complaints being raised by those unaware of the extent of the approval, with these complaints not directed through the appropriate project hotline.</p> <p>Unauthorised release of project information by the project team to the media, stakeholders or the community has potential to impact on project perception in the community.</p>	<p>The CCS includes measures at Section 5.4.2 to provide regular updates in plain language, supported by imagery to stakeholders and the wider community through public and private media.</p> <p>Contact details including the hotline details will be provided on site, the project web page and in all information issued.</p>
Emergency Event	<p>Unforeseen emergency with the potential to impact on the community either directly, or indirectly through out of hours activities that may generate additional traffic or noise.</p>	<p>The CCS includes measures at Section 5.4.2 to provide updates in emergency events, with the CEMP and Emergency Management Plan identifying specific mechanisms to manage and mitigate these impacts.</p>

4 Communications and Community Liaison Representative

Goodman have appointed a Communications and Community Liaison Representative (CCLR) who will provide the community and stakeholders with a single point of contact for both components of the project, responsible for receiving and disseminating information requests and complaints, along with addressing any interface issues. The CCLR will also facilitate property access should it be required.

The CCLR will be available for contact by local residents and the community at all reasonable times to answer any questions and address any concerns relating to the project. The CCLR will have up-to-date information on:

- Emerging stakeholders
- Planned construction activities
- Planned traffic arrangements, including any temporary traffic switches
- Current landowner discussions with members of staff
- Planned community and stakeholder consultation
- Complaints or enquiries received
- Duties and accountabilities of staff
- Commitments to stakeholders made by Goodman.

The CCLR will be supported by a community consultation team with the following responsibilities:

- Development and delivery of communications strategies, including meeting/workshop facilitation.
- Maintenance of the community and stakeholder consultation register.
- Property owner liaison to address property specific issues.
- Preparation of material and facilitating group and public meetings, workshops and forums for the works.
- Liaison with the construction team to identify items of potential community interest within the upcoming construction program.
- Identifying opportunities for improvement, monitoring community feedback and reporting back to the community via updates to the project web page and at regular community meetings.

The CCLR details are:

- Dan Thompson – Principal Planner – SLR
dthompson@slrconsulting.com; 1300 002 887
- Kate McKinnon – Associate – SLR
kmckinnon@slrconsulting.com; 1300 002 887

5 Community and Stakeholder Engagement

5.1 Objectives

The key objectives of the strategy are to meet the requirements of condition C19 of SSD7348 and:

- Keep the local community and key stakeholders informed of the commencement and progress of works relating to the OWE project.
- Ensure that enquires and complaints received from the community or key stakeholders are addressed and responded to in a timely and effective manner.
- Inform nearby sensitive receivers in advance of potential disturbances and events likely to cause impact.
- Be good neighbours and members of the local community throughout the duration of the project's lifespan.
- Providing an open two communications channel to allow ongoing, iterative engagement.
- Seek opportunities for improvement throughout the project.

5.2 Approach

Goodman are committed to delivering Community and Stakeholder Engagement outcomes utilising the following principles at the core of their approach:

- **Clarity** – Communication and engagement will be delivered in a clear and easy to understand manner to ensure the project and all associated works are fully understood by the community and stakeholders.
- **Proactivity** – Consultation and notice shall be given prior to the commencement of works or the undertaking of potentially impactful activities.
- **Transparency** – Communication and engagement will be undertaken in an open and transparent fashion, with information shared between the community and the project team.
- **Accessibility** – Information relating to the project will be accessible via a broad range of mediums and will be made readily available to the community and stakeholders. Several avenues of contact shall be provided for the purposes of enquiry or complaint.

In their communications and consultation with the community and key stakeholders, Goodman and their representatives will comply at all times with the requirements of the *Privacy and Personal Information Protection Act 1998 (NSW)* and the *Privacy Act 1988 (Cth)*.

5.3 Communication, Management and Mitigation Tools

A range of tools and techniques will be used to inform and engage with the community and stakeholders regarding the project. **Table 5** below provides an overview of the mechanisms to be utilised to regularly inform and consult with the local community and key stakeholders and measures to mitigate potential issues throughout the development.

Table 5 Communication Management and Mitigation Tools

Tool/ Technique	Description	Person Responsible	Audience	Frequency/timing	Specifications
Community Consultation Meetings	Informal meetings, providing a project update and opportunity for the community and stakeholders to discuss recent experiences and upcoming construction activities.	CCLR and Community Consultation Team	The wider community and key stakeholders.	Meetings would initially be held quarterly, with the frequency then subject to the level of interest and the construction program.	Project updated including a review of any complaints received and remedial actions, followed by informal discussion with stakeholders and the community.
Community Workshops/Forums	An initial community workshop/forum to be held to identify the overarching construction program and communications protocols, with the event advertised via local newspaper and letter box drop.	CCLR and Community Consultation Team	The wider community and key stakeholders.	Prior to commencement of construction.	The first portion of the workshop is formal, identifying the project program, key personnel and the communications protocol. The second portion is informal with time for stakeholders and the community to ask questions and discuss any concerns.
Consultation Register	Recording community and stakeholder interactions, along with associated remedial actions as required.	CCLR and Community Consultation Team	The wider community and key stakeholders.	Project duration.	The consultation register satisfies the requirements of Condition C19 of SSD7348, and Specification 3.7.3 of the RMS G36 Specifications requiring a Complaints Register. The register will be continually updated to record community engagement, including information provided by Goodman, feedback received, and remedial action undertaken where required.

Tool/ Technique	Description	Person Responsible	Audience	Frequency/timing	Specifications
Environmental Review Group Meeting	Meeting of key environmental stakeholders	Environmental Representative	All environmental stakeholders	As required for the project duration	The Environmental Review Group will be briefed on upcoming project tasks with key environmental implications, along with complaints and enquiries received
Individual Community Meetings	Meetings with stakeholders as required to discuss a specific item.	CCLR and Community Consultation Team	The wider community and key stakeholders.	As required.	Details and format subject to the meetings context, with a record of the discussion included in the consultation register and actioned as required.
Newspaper Advertisement	Newspaper Advertisement(s) to be published in The Western Weekender and Mt Druitt – St Marys Standard identifying the project hotline number and web page address.	CCLR and Community Consultation Team	The wider community and key stakeholders.	Prior to the commencement of the initial construction activities on the site and throughout the project prior to known key intrusive events.	An advertisement will be published advising of the commencement date of construction, a brief overview of the project and key contact details for enquires and complaints including the hotline, webpage and email address. Further advertisements will be published where intrusive events are scheduled advising of the nature and date(s) and time(s) of the event and key contact details for enquiries and complaints.
Notification Letterbox Drop	Letters would be provided to specific receivers identified as being potentially affected by construction. This could be undertaken in tandem with door knocking.	CCLR and Community Consultation Team	Residents of the immediate area.	As required for the project duration.	Letter box drop details to be recorded in the consultation register. Timing of construction activity to be identified along with relevant contact details.
On Site Signage	Project information details.	CCLR and Community Consultation Team	Visitors to the site and residents of the immediate area.	Project duration.	Contain key project contact details including the hotline and web page, along with relevant project and safety information.

Tool/ Technique	Description	Person Responsible	Audience	Frequency/timing	Specifications
Online Feedback Forms	Simple form allowing rapid ad hoc feedback.	CCLR and Community Consultation Team	The wider community and key stakeholders.	Project duration.	Form available on the Oakdale project web page, with feedback provided to be incorporated into the consultation register and actioned as required.
Project Information and Complaints Number	Project hotline available for 24 hours recording of project feedback.	CCLR and Community Consultation Team	The wider community and key stakeholders.	Project duration.	Hotline number located on site signage, the web page and all project information material. Feedback provided to be incorporated into the consultation register and actioned as required.
Staff and Visitor Induction and Training	Project information details.	Site Forman and Management Staff	Staff and visitors to the site.	Project duration.	Key project safety information, contact details, emergency procedures and site information.
Toolbox and Prestart Meetings for WNSLR and Stage 1 Infrastructure Works	Project information details.	Site Forman and Management Staff	Staff and visitors to the site.	Project duration.	Task specific safety information, emergency procedures and relevant project updates. All staff and subcontractors to be made aware of external and internal communications procedures
Text Message and Email Alerts	Text messages providing prompt updates	CCLR and Community Consultation Team	Residents of the immediate area.	As required for the project duration.	Text Messages and email alerts will provide important information at short notice to potentially affected receivers. Text message and email details to be recorded in the consultation register.

Tool/ Technique	Description	Person Responsible	Audience	Frequency/timing	Specifications
Website	A web page is established at: oakdaleopportunities.com	CCLR and Community Consultation Team	The wider community and key stakeholders.	Project duration.	Website address and phone number located on site signage and all project information material. Web page to provide contact details including hotline, email address and enquiry form, as well as project updates, along with environmental performance monitoring. Refer to Section 5.3.1 below for further details.

5.3.1 Project Website

Goodman has established a website for the project (oakdaleopportunities.com). The website was established prior to the commencement of works and will be maintained during the delivery of the project until the completion of all works.

The following information will be updated monthly or more frequently when necessary and made available on the website as required by SSD 7348 Condition D143:

- A copy of the documents listed in Condition D2 of the SSD Consent (SSD 7348).
- All current statutory approvals for the Development.
- All approved strategies, plans and programs required under conditions of the SSD Consent (SSD 7348).
- The proposed staging plans for the Development if the construction, operation or decommissioning of the Development is to be staged.
- A comprehensive summary of the monitoring results of the Development, reported in accordance with the specifications in any conditions of the SSD Consent (SSD 7348), or any approved plans and programs.
- A summary of the current stage and progress of the Development.
- Contact details (including email address, phone number and postal address) to enquire about the Development or to make a complaint.
- A complaints register, updated monthly and details of the complaints handling protocol for the project.
- The Compliance Report of the Development.
- Audit reports prepared as part of any monitoring or environmental audit of the Development and the Applicant's response to the recommendations in any audit report.
- Any other matter required by the Planning Secretary.

5.3.2 WNSLR Works Liaison and Notification Requirements

Where works relate to the construction of the WNSLR, the RMS QA Specification G36 – Environmental Protection sets out a number of specifications and measures addressing notification to the community and affected stakeholders. In order to comply with these requirements, Goodman shall undertake the following activities:

- Goodman shall notify local residents and other stakeholders about any new or changed construction activities including changes to bus stop locations and / or timetables, which will affect access to their properties/ premises at least five 5 working days before commencing work affecting residents.
- Such notification will state the nature of the work, why it is necessary, the expected duration, details of any changes to the traffic arrangements or property access and the name and 24-hour contact telephone number of the CCLR who can respond to any resident/stakeholder concerns.
- Any complaints shall be addressed in accordance with the complaint's procedure outlined in Section 5.4 of this strategy.
- Where extended working hours are proposed, the contractor shall inform Goodman who will subsequently inform residents of the proposed work outside normal working hours in accordance with the requirements outlined in this strategy. Written approval from the Planning Secretary will be sought for out of hours work.

- Within one working day of receiving a complaint about any environmental or other issue which has the capacity to damage Goodman's reputation, including any pollution incidents, arising from the Work Under the Contract, a written report to Goodman shall be submitted detailing the complaint and the action taken to remedy the problem. A final report together with proposed measures to prevent the recurrence of such incidents shall be submitted to the Goodman within 5 working days.

The contractor shall adhere to set timeframes for notification of Goodman and distribution of notice to the community and stakeholders for activities related to the WNSLR. This commitment is outlined in **Tables 6 and 7** below:

Table 6 Notification Requirements for Goodman prior to Construction Activities

Activity	Notification required
Work at night (any time between 6pm and 7am)	2 weeks where possible, a minimum of 1 week
Work on weekends (including public holidays)	2 weeks where possible, a minimum of 1 week
Major changes to configuration of road traffic	At least 4 weeks
Impacts on pedestrians and/or bicyclists	At least 4 weeks
Commencement, rescheduling or completion of key construction activities	At least 4 weeks for commencement and completion, 24 hours' notice for rescheduling
Commencement or rescheduling of property adjustment work	At least 2 weeks (four weeks for businesses)
Alteration to property access arrangements	At least 4 weeks
Other activities not identified above which may impact on the community stakeholders	At least 24 hours
Any form of community protest on site	Immediately

Table 7 Notification Requirements for works

Notification Type	Submission to Goodman	Distribution to Community and Stakeholders
Out of Hours Works / Night Works	Draft a notification letter at least 24 hours prior to the works being carried out	2 weeks where possible, a minimum of 1 week prior to the works being carried out
Traffic Conditions	Draft letter at least 4 weeks prior to the traffic conditions changing	At least 5 business days prior to the traffic conditions changing if deemed necessary by Goodman
Individual private properties regarding property adjustments or changes to access	Draft letter at least 4 weeks prior to the works being carried out	At least 2 weeks prior to the works being carried out of access changes
Access for bridgeworks over the Water NSW pipelines	Final draft of notification at least 4 weeks prior to be works being carried out	At least 4 weeks prior to the works being carried out
Individual businesses regarding property adjustments or changes to access	Draft letter at least 4 weeks prior to the works being carried out	At least 4 weeks prior to the works being carried out of access changes

5.3.3 Communication with Sensitive Receivers' Procedure

During the course of works the CCLR will consult with nearby sensitive receivers listed below when necessary to advise of and/or schedule events and activities with the potential to cause impact such as high noise generating works, vibration intensive activities or traffic management disruptions.

Sensitive receivers are considered to include adjacent and directly affected properties, businesses and schools including:

- Residential properties located along Aldington Road (As shown in **Appendix A**).
- Emmaus Catholic Primary School and High School and Retirement Village on Bakers Lane.

Where development works have the potential to impact on sensitive receivers the community relations manager will implement the sensitive receiver procedure outlined in **Table 8** below:

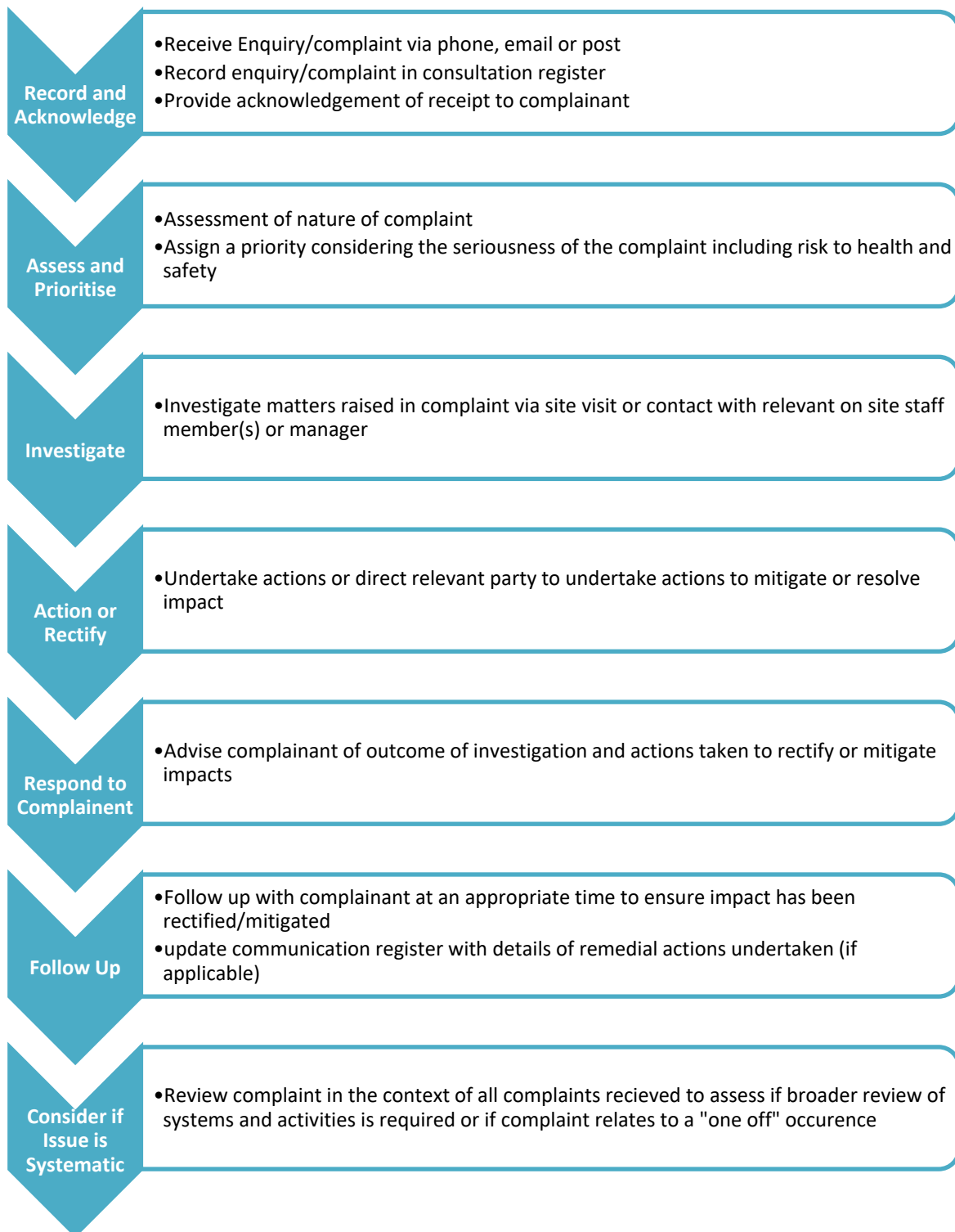
Table 8 Sensitive Receiver Procedure

Potential Impact	Method of Contact/Consultation	Timeframe
High noise generating work	Email, Text Message or Letterbox drop – notifying of expected commencement, duration and affected hours	No less than 24 hours prior to the activity
Vibration intensive activity	Email, Text Message or Letterbox drop – notifying of expected commencement, duration and affected hours	No less than 24 hours prior to the activity
Traffic management disruption	Email, Text Message or Letterbox drop – notifying of expected commencement, duration and affected hours Variable Message Signs	No less than 24 hours prior to the activity

5.4 Complaints Procedure

Goodman are committed to the timely and effective management of enquiries and complaints relating to construction activities for the OWE. To this end, the following complaints procedure shown in **Figure 2** will be adhered to, enabling the receipt and recording of enquiries and complaints, along with the methods of response and resolution of issues raised.

Figure 2 Complaints Handling Procedure



5.4.1 Protocol for Receiving and Recording Enquiries and Complaints

Goodman have established a project email and postal address for the receipt of enquiries and complaints relating to the development. The email and postal accounts will be regularly monitored to receive and respond to customer feedback and enquiries. The community information line (1300002887) is to be established from the commencement of works. The CCLR and community consultation team will manage the information line from the commencement of the project until the completion of works. Where calls are received during hours of construction work (including out of hours works) all calls will be answered by the CCLR. Where calls are received outside of hours of construction works the caller will be invited to leave a message. All approaches from the community and stakeholders will be registered in the project's consultation register. The facilities established for receiving enquiries and complaints about the project during construction are shown in **Table 9**.

Table 9 Enquires and Complaints Facilities

Facility	Purpose	Detail
Community Information Line	A contact phone number and associated contact name for questions/enquiries and the lodgement of complaints relating to the development.	1300 002 887
Email Address	An email address accessible via email and online enquiry form for questions/enquiries and the lodgement of complaints relating to the development.	community.oakdalewest@goodman.com
Postal Address	A postal address for the receipt of questions/enquiries and the lodgement of complaints relating to the development.	Level 17, 60 Castlereagh Street, Sydney, NSW 2000
In person verbal	Verbal enquiries and complaints can be made formally during community meetings or may be made informally where staff interact with members of the public in informal settings.	Verbal in person comments and submissions

Goodman have established a consultation register to record all complaints and enquiries received by the above means. The consultation register will be maintained on a regular basis and used to inform discussion at monthly community consultation and project team meetings. The consultation register shall include the following details for all complaints or enquiries received:

- Date and time of complaint or enquiry.
- Method by which the complaint or enquiry was made.
- Name, address, contact telephone number of complainant (if no such details were provided, a note to that effect).
- Nature of complaint or enquiry.
- Action taken in response including follow up contact with the complainant.
- Any monitoring to confirm that the complaint or enquiry has been satisfactorily resolved.
- If no action was taken, the reasons why no action was taken by you.

An excerpt of the consultation register is included at **Appendix B**.

5.4.2 Protocol for Responding to and Resolving Enquiries and Complaints

Where a complaint or enquiry is received the CCLR will attempt to provide an immediate response if possible via phone or email. Where a complaint or enquiry cannot be responded to immediately the CCLR will assess and prioritise the submission and provide the complainant or enquirer with a follow up verbal response on what action is proposed within two hours during construction works (including night and weekend works) and 24 hours at other times. Where a complaint or enquiry cannot be resolved by the initial or follow-up verbal response, a written response will be provided to the complainant or enquirer within ten days.

In the event of a complaint, the CCLR will assess whether the complaint is founded or unfounded and if necessary delegate the remediation of the issue to the project manager for action or to the relevant project engineer. The CCLR will oversee the rectification of the issue and respond to the complainant once the issue has been resolved.

In the event of an enquiry, the CCLR will endeavour to provide an immediate response where they are in possession of the relevant information. Where more specific or detailed information is required, the CCLR will liaise with the project manager or relevant project engineer to obtain the information required to respond to the enquiry and provide this information to the enquiring party once in hand.

Where the above protocol is unsuccessful in resolving complaints, mediation may be undertaken at the discretion of Goodman to facilitate negotiation between affected parties. This shall be performed by an independent person (mediator) appointed by Goodman.

5.4.3 Unreasonable Complainant Conduct

The NSW Ombudsman provides guidelines which define unreasonable complaint conduct as:

“...any behaviour by a current or former complainant which, because of its nature or frequency, raises substantial health, safety, resource or equity issues for the parties to a complaint.”

Whilst it is not envisioned that the project will attract complainants that exhibit this behaviour, where a complainant is seen to potentially have a negative impact on the CCLR or support team's health, safety, resourcing or equity of service, Goodman shall adhere to the procedures and practices outlined within the NSW Ombudsman's *“Managing Unreasonable Complainant Conduct Practice Manual 2nd Edition”*.

5.4.4 Contingency Management Plan

In accordance with Condition D118(d) of the SSD 7348 consent, a contingency management plan has been developed to outline the management of unpredicted impacts and their consequences. Details of these events, their severity and response are detailed in **Table 10** below:

Table 10 Contingency Management Plan

Key Element	Trigger/ Response	Condition Green	Condition Amber	Condition Red
Submission	Trigger	General feedback/comment (no complaint or query).	Enquiry made by formal or informal channels.	Complaint made by formal or informal channels.
	Response	Acknowledge receipt and record in consultation register. No further response required.	Acknowledge receipt and record in consultation register. Direct enquiry to relevant person for actioning and response within 5 days.	Acknowledge receipt and record in consultation register. Respond to complaint immediately if possible, if not direct enquiry to relevant person for actioning and provide complainant with a follow up verbal response on what action is proposed within two hours during construction works (including night and weekend works) and 24 hours at other times.
Media	Trigger	Positive story in print, online, radio or television.	Neutral or advisory story in print, online, radio or television.	Negative story in print, online, radio or television.
	Response	Record in consultation register and advise Goodman media/marketing team. No further response required.	Record in consultation register and advise Goodman media/marketing team. No further response required.	Record in consultation register and advise Goodman Project Team for further action and response. Contact relevant person for actioning and response within 48 hours
Unscheduled Event	Trigger	Event occurring outside of plan or schedule without impact or potential impact.	Event occurring outside of plan or schedule with minor impact or potential impact.	Event occurring outside of plan or schedule with major impact or potential impact.

Key Element	Trigger/ Response	Condition Green	Condition Amber	Condition Red
	Response	No response required. Identify opportunities for improvement to manage potential future events.	Contact relevant person for actioning and response within 48 hours. Acknowledge in consultation register. Identify opportunities for improvement to manage potential future events.	Contact relevant person for actioning and response immediately. Acknowledge in consultation register. Identify opportunities for improvement to manage potential future events.
Political Interest	Trigger	General or non-specific enquiry by Local, State or Federal political representative.	Enquiry or complaint relating to minor issue by Local, State or Federal political representative.	Enquiry or complaint relating to major issue by Local, State or Federal political representative.
	Response	Community consultation team in conjunction with Goodman Project Team to prepare and provide response or assign response task to relevant staff member for comment. Record in consultation register.	Community consultation team in conjunction with Goodman Project Team to prepare and provide response within 48 hours. Record in consultation register.	Community consultation team in conjunction with Goodman Project Team to prepare and provide response within 24 hours. Record in consultation register.

6 Monitoring, Reporting and Evaluation

Monitoring, Reporting and Evaluation will be undertaken to measure the effectiveness of community consultation, stakeholder engagement and responses to complaints and enquiries. Opportunities for improvement will be sought on a continuous basis, with an annual review of the CCS undertaken to formalise these incremental improvements.

6.1 Monitoring

The performance of this strategy will be monitored monthly based upon an assessment of the following data:

- Total number of monthly complaints.
- Review of number of monthly complaints relating to lack of consultation/misinformation/confusion.
- Review of number of monthly enquiries relating to information previously disseminated to the community through other channels.
- Monthly review of enquiries or complaints of a similar nature or theme indicative of underlying systematic issues with the project or communication strategy.
- Response timeframes, including initial acknowledgement and the response to enquiries or remediation of issue(s).

The parameters of monitoring and performance criteria are outlined in **Table 11** below.

Table 11 Summary of Monitoring Data

Monitoring Parameter	Rationale	Performance Criteria	Monitoring Frequency
Total number of complaints	The number of complaints received in total is indicative of the community's satisfaction with the project.	A reduction in number of complaints, baseline determined by number of complaints received in preceding months.	Monthly
Number of complaints relating to lack of consultation/misinformation/confusion	Number of complaints relating to lack of consultation/ misinformation/ confusion is indicative of the effectiveness and clarity of communication tools utilized.	A reduction in number of complaints, baseline determined by number of complaints received in preceding month.	Monthly
Number of enquiries relating to information previously disseminated	Number of enquiries relating to information previously disseminated is indicative to the effectiveness of the delivery of information.	A reduction in number of enquiries, baseline determined by number of enquiries received in preceding month.	Monthly
Number of complaints/enquiries within defined categories based on theme or subject	A large number of complaints or enquiries relating to a single issue may be indicative of a systematic issue to be addressed as a priority.	A reduction in number of complaints, baseline determined by number of complaints received in preceding month.	Monthly

Monitoring Parameter	Rationale	Performance Criteria	Monitoring Frequency
Response timeframes	Response to enquiries and complaints should be timely to ensure effective responsiveness and rectification of issues and to encourage trust within the community.	Enquiries and complaints acknowledged within 48 hours. Urgent enquiries and complaints responded to within 48 hours of receipt, non-urgent enquiries and complaints responded to within 5 days.	Monthly

6.2 Reporting

Reporting shall be undertaken annually, with a monthly summary of results provided to the approved Environmental Representative (ER) in accordance with Conditions D127(e) and D128 of SSD77348 and the broader project team during monthly project team meetings. The monthly community consultation summary will be made publicly available on the project web page and shall include:

- A summary of community consultation activities undertaken within the preceding month
- A summary of community consultation activities proposed within the following month
- A summary of all enquiries and complaints received within the preceding month, including details of response and/or remediation activities.

Within three months of the submission of documentation identified by Condition D133 this CCS would be reviewed for compatibility.

6.3 Evaluation

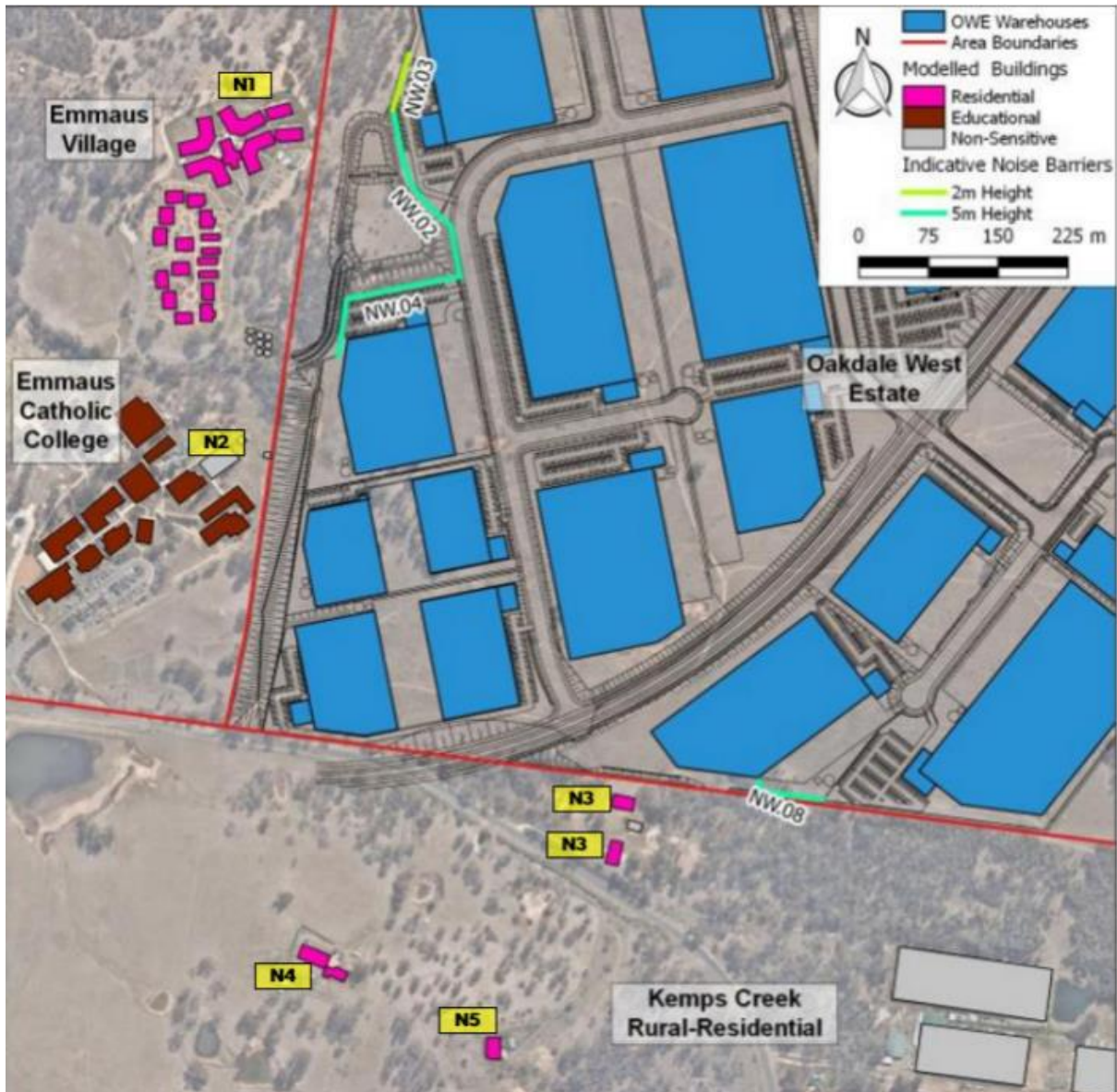
Where performance criteria are not being satisfied, review of this strategy and its implementation will be undertaken by the Community Consultation Team and changes to the strategy may be made to rectify the short fall. Where systematic issues are identified associated with construction activities, the project manager will be advised and immediate rectification of the issue will be requested.

7 References

- NSW Ombudsman (2012) *Managing Unreasonable Complainant Conduct Practice Manual 2nd Edition*
- SLR Consulting Australia (2019) *Construction Environmental Management Plan*
- Urbis (2017) *Environmental Impact Statement – Oakdale West Estate (State Significant Development Application Ref 7348)*
- Urbis (2018) *Response to Submissions (A)*
- Urbis (2018) *Response to Submissions (B)*

APPENDIX A

Sensitive Receiver Map



APPENDIX B

Key Stakeholder Contact Details

Contact Name/Organisation	Contact Details
The Residents – 20 Aldington Road	
Emmaus Catholic College	Harvey Anchique - Business Manager P: (02) 9670 8300 F: (02) 9834 3403 M: 0428 063 119 E: hanchique@parra.catholic.edu.au
Trinity Catholic Primary School	Catherine Hey - Principal, chey@parra.catholic.edu.au, 02 8856 6200
Mamre Anglican School	Cathie Graydon – Principal (02)98341881, cathie.graydon@mamre.nsw.edu.au Marijana Motrivic, Business Manager 02, 8073 6908 marijana.mitrovic@mamre.nsw.edu.au,
Catholic Healthcare Emmaus Village	James Byrne Building Services Manager, M. 0434604370, jbyrne@chcs.com.au Kate Todd, Emmaus Village, ktodd@chcs.com.au, Home, 02 8804 0200
Little Smarties Learning Centre	61 2 9834 2155 kempscreek@littlesmarties.com.au
Penrith City Council	61 2 4732 7777 council@penrith.city
NSW EPA	131 555 info@epa.nsw.gov.au
NSW Biodiversity and Conservation Division, Department of Planning Industry and Environment	61 2 9995 5000 info@environment.nsw.gov.au
NSW Department of Industry	61 2 9338 6600
Roads and Maritime Service	13 22 13
Transport for NSW	61 2 8202 2200
NSW Rural Fire Service	61 2 8741 5555 webmaster@rfs.nsw.gov.au
WaterNSW	1300 662 077 Customer.Helpdesk@waternsw.com.au
National Resources Asset Regulator	61 2 9338 6600
TransGrid	61 2 9284 3000
Endeavour Energy	131 081
Sydney water	13 20 92
Jemena	1300 536 362
NBN	1300 687 626
Telstra	13 22 00
Registered Aboriginal Parties	See Appendix C

APPENDIX C

Registered Aboriginal Parties

Name	Organisation	Address	Suburb	State	Postcode	Email	Phone	Notes
Caroline Hickey	A1 Indigenous Services					cazadirect@live.com	Mobile: 0411 650 057	
Andrew Williams	Aboriginal Archaeology Service Inc.	PO Box 6283	Rouse Hill	NSW	2155	AAS.info@bigpond.com	Mobile: 0490 126 040	
Amanda Hickey	Amanda Hickey Cultural Services	41 Dempsey St	Emu Heights	NSW	2750	amandahickey@live.com.au	Mobile: 0434 480 588	
Karia Lea Bond	Badu	11 Jeffery Pl	Morya	NSW	2537	baduclhts@gmail.com	Mobile: 0476 381 207	
Sell Storer	Biamanga					biamangaclhts@gmail.com		
Richard Andy	Bidawal CHTS					bidawalclhts@gmail.com		
Simalene Cariage	Bilinga					bilingaclhts@gmail.com		OR Wandai Kirkbright???
								Website: http://www.butucarbin.org.au/ , postal address: PO Box E18 Emerton NSW 2770
Jennifer Beale	Butucarbin Aboriginal Corporation	28 - 30 Pringle Road	Hebersham	NSW	2770	koori@ozemail.com.au	Office: (02) 9832 7167, Mobile: 0409 924 409	
Marylin Carroll-Johnson	Corroborree Aboriginal Corporation	PO Box 3340	Rouse Hill	NSW	2155	corroboreecorp@bigpond.com.au	Mobile: 0415 911 159	Contact details for Steve Johnson
Corey Smith	Cullendulla Darug Aboriginal Cultural Heritage					cullendullaclhts@gmail.com		
Gordon Morton	Assessments	Unit 9, 6 Chapman Ave	Chatswood	NSW	2067		Office: (02) 9410 3665, Mobile: 0422 865 831	
Des Dyer	Darug Aboriginal Landcare	18A Perigee Close	Doonside	NSW	2767	desmond4552@hotmail.com	Mobile: 0408 360 814	Site officer: 0402 942 572
Justine Coplin	Darug Custodian Aboriginal Corporation	PO Box 81	WINDSOR	NSW	2756	justinecoplin@optusnet.com.au	(02) 4577 5181	
Leanne Watson	Darug Custodian Aboriginal Corporation	PO Box 81	Windsor	NSW	2758	mulgokivi@bigpond.com	Office: (02) 4577 5181, Mobile: 0415 770 163	
Jamie Workman	Darug Land Observations PTY LTD	PO Box 571	Plumpton	NSW	2761	daruglandobservations@gmail.com	Mobile: 0420 591 138	
Gordon Workman	Darug Land Observations PTY LTD	PO Box 571	Plumpton	NSW	2761	gordow51@bigpond.net.au	Mobile: 0415 663 763	Deceased
John Reilly	Darug Tribal Aboriginal Corporation	PO Box 441	Blacktown	NSW	2148	Jmreilly228@gmail.com	Office: (02) 9622 4081	
Steve Randall	Deerubbin Local Aboriginal Land Council							
Andrew Bond	Dharug CHTS	2/9 Tindale St	Penrith	NSW	2750	SRandall@deerubbin.org.au darugclhts@gmail.com	Office: (02) 4724 5600	
Ricky Fields	Dhinawan-Dhigaraa Culture and Heritage PTY LTD	19 Moomi St	Lalor Park	NSW	2147	Dhinawan2@yahoo.com.au	Mobile: 0402 942 572	
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Wendy Smith	Gulaga					gulagaclhts@gmail.com		
Christopher Payne	Gundungurra Tribal Technical Services	9/15/22 Burns Rd	Leumeah	NSW	2560	chrispayne776@gmail.com	Mobile: 0466 975 437	
David Bell	Gundungurra Tribal Technical Services	67 Dickens Rd	Ambarvale	NSW	2560	gundungurratectribsevice@gmail.com	Mobile: 0450 124 891	
Larry Hoskins	Gundungurra Tribal Technical Services	2/3 Colville Pl	Rosemeadow	NSW	2560	gundungurratectribsevice@gmail.com	Mobile: 0478 009 879	
Pimmy Johnson Bell	Gundungurra Tribal Technical Services	67 Dickens Rd	Ambarvale	NSW	2560	gundungurratectribsevice@gmail.com	Mobile: 0425 066 100	
Sam Wickman	Gundungurra Tribal Technical Services					gundungurratectribsevice@gmail.com		
Teangi Mereki Foster	Gundungurra Tribal Technical Services	1/6 Central Ave	Oak Flats	NSW	2529	gundungurratectribsevice@gmail.com	Mobile: 0420 978 969	
Cherie Carroll Turrise	Gunjeewong Cultural Heritage Aboriginal Corporation							
		1 Bellvue Place	Portland	NSW	2847	julieschroder5@live.com.au	Office: (02) 6355 4110	
Lisa Green	Gunninderra Aboriginal Corporation	PO Box 3340	Rouse Hill	NSW	2155	ginninderra.corp@gmail.com	Mobile: 0404 297 224	Contact: Krystle Carroll
Darlene Hoskins-McKenzie	Gunyu CHTS					gunyuclhts@gmail.com		
Patricia Hampton	HSB Consultants	62 Ropes Crossing Boulevard	Ropes Crossing	NSW	2760	hsb_heritageconsultants@mail.com	Mobile: 0424 142 216	

Joanne Anne Stewart	Jerriong					jerriong@gmail.com	Mobile: 0422 800 184	
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	Kuringgai CHTS					kuringgaichts@gmail.com		
Shaun Carroll	Merrigarn Indigenous Corporation	GPO Box 158	Canberra City	ACT	2601	merrigarn@yahoo.com.au	Mobile: 0435 040 842	
Aaron Broad	Minnamunnung	1 Waratah Ave	Albion Park	NSW	2527	nundagurri@gmail.com	Mobile: 0402 526 888	
Kaya Dawn Bell	Munyunga					munyungachts@gmail.com		
Roxanne Smith	Murramarang					murramarangchts@gmail.com		
	Murri Bidgee Mullangari Aboriginal Corporation							
Darleen Johnson	Murrin CHTS	PO Box 246	Seven Hills	NSW	2147	murrabidgeemullangari@yahoo.com.au	Mobile: 0490 051 102	
						murrinchts@gmail.com		
levi McKenzie-Kirkbright	Murrumbul					murrumbul@gmail.com		Or Levi McKenzie-Kirkbright?????
Newton Bond	Ngarigo CHTS					ngarigochts@gmail.com		
Edward Stewart	Ngunawal					ngunawalchts@gmail.com		
Newton Carriage	Nundagurri					nundagurri@gmail.com		
Pemulwuy Johnson	Pemulwuy CHTS	14 Top Place	Mount Annan	NSW	2567	pemulwuyd@gmail.com	Mobile: 0425 066 100	
Tony Williams	Rane Consulting	1 Pyrenees Way	Beaumont Hills	NSW	2155	ajw1901@bigpond.com	Office: (02) 8824 6991	
	Thalaira CHTS					thauairachts@gmail.com		
								Changed Violet to John as he was elected chairman in May 2018
John Carriage	Tharawal CHTS					tharawalchts@gmail.com		
Danny Franks	Tocomwall	PO Box 76	Caringbah	NSW	1495	danny@tocomwall.com.au	Mobile: 0415 226 725	
Hika Te Kowhai	Walbunja					walbunja@gmail.com	Mobile: 0402 730 612	
	Walgalu CHTS					walgaluchts@gmail.com		
William Bond	Wandandian					wandandianchts@gmail.com		
Aaron Slater	Warrigal Cultural Services					Warrigal_cs@hotmail.com	Mobile: 0421 355 890	Changed William to Aaron
Steven Hickey	Widescope Indigenous Group	73 Russell St	Emu Plains	NSW	2750	widescope.group@live.com	Mobile: 0425 230 693	
Hayley Bell	Wingikara					wingikarachts@gmail.com		
Lee-Roy James Boota	Wullung	54 Blackwood St	Gerriongong	NSW	2534	wullunglb@gmail.com	Mobile: 0403 703 942	
Kerrie Slater	Wurrumay Consultant					wurrumay@hotmail.com		
Robert ParsonS	Yerramurra					yerramurra@gmail.com		

APPENDIX D

Complaints Register

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Perth WA 6000
Australia
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WOLLONGONG

Level 1, The Central Building
UoW Innovation Campus
North Wollongong NSW 2500
Australia
T: +61 404 939 922

APPENDIX J

Construction Noise and Vibration Management Plan

WESTERN NORTH SOUTH LINK ROAD

Construction Noise and Vibration Management Plan SSD 7348

Prepared for:

Goodman Property Services (Aust) Pty Ltd

Level 17

60 Castlereagh Street

Sydney NSW 2000

PREPARED BY

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Lane Cove NSW 2066 Australia
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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Goodman Property Services (Aust) Pty Ltd (the Client). 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 the Client. 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 SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
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APPENDICES

Appendix A	Acoustic Terminology
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1 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Goodman Property Services (Aust) Pty Limited (Goodman) to prepare a Construction Noise and Vibration Management Plan (CNVMP) for construction works associated with the development of the Western North South Link Road (WNSLR), located in Erskine Park and Kemps Creek.

The CNVMP addresses the potential noise and vibration impacts associated with the construction of the development and details the mitigation and management procedures for dealing with potential impacts. Construction noise and vibration impacts were previously assessed for WNSLR as part of the *Western North-South Link Road DA Noise Impact Assessment* prepared by SLR in September 2016 (the NIA).

1.1 Development Overview

The WNSLR is an Interim Regional Road located on the eastern boundary of the Oakdale West Industrial Estate (Oakdale West). Oakdale West is a regional warehouse and distribution hub located at Kemps Creek within the Penrith local government area (LGA) and forms part of the broader Oakdale Industrial Precinct located within the Western Sydney Employment Area (WSEA) (see **Figure 1**).

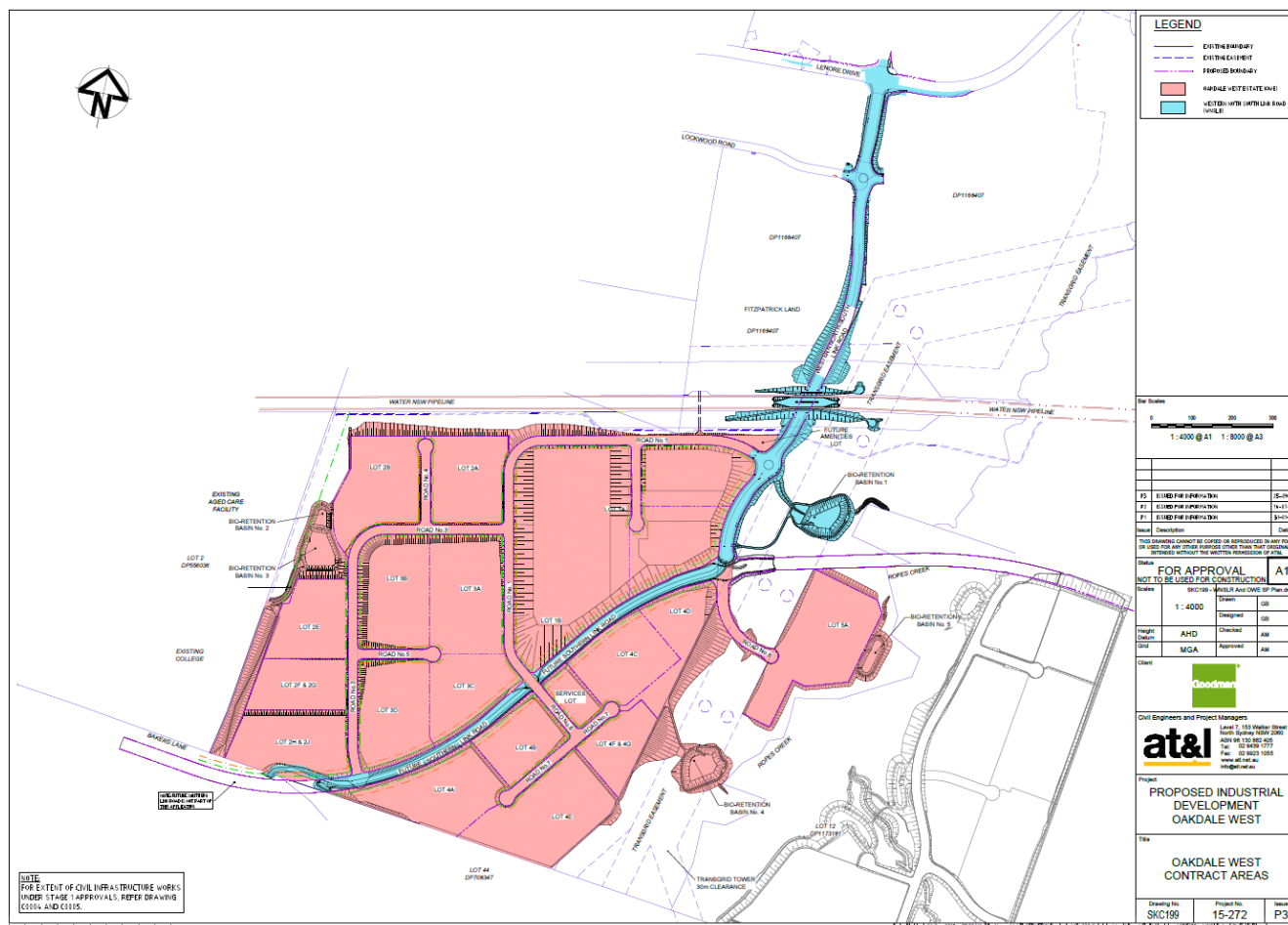
Goodman Property Services (Aust) Pty Ltd (Goodman) obtained Development Consent SSD 7348 on 13 September 2019 from the Department of Planning, Industry and Environment (DPIE) for the Oakdale West 'Concept Proposal' and 'Stage 1 Development'. The Concept Proposal essentially comprises a 'Master Plan' to guide the staged development of Oakdale West and core development controls that will form the basis for design and assessment of future development applications for the site. It includes:

- Establishing primary site access, road layouts (including internal road network and connections to the external road network), developable and non-developable lands, biodiversity offsets, indicative development stages and development controls for the future development of the site;
- Stage 1 Development of the Estate including:
 - Estate Works, including site preparation, bulk earthworks and retaining walls, catchment level stormwater infrastructure, trunk services connections and utility infrastructure, roads and access infrastructure associated with Stage 1 and subdivision in Stage 1 development works;
 - Precinct Development, including construction, fit out and use of warehouse buildings within Precinct 1, detailed earthworks, on lot stormwater, services and utility infrastructure and construction of industrial/warehouse buildings;
 - Construction of a new regional road known as the Western North South Link Road (WNSLR) connecting to Lenore Drive to provide the primary access to the site; and
 - Western boundary landscaping.

The WNSLR is intended to provide a connection between Lenore Drive and the future Southern Link Road currently under investigation by the DPIE. In the short term the WNSLR will be a public road managed by Penrith City Council (Council), providing local access for Oakdale West and other industrial areas north of the Water New South Wales (WaterNSW) pipeline located on the northern boundary of Oakdale West (see **Figure 2**).

For the purposes of this document, the development is described in *Environmental Impact Statement, Oakdale West Estate - State Significant Development Application* (EIS) prepared by Urbis (2017), including all specialist assessments and other appendices.

Figure 2 WNSLR Layout



Note 1: WNSLR and construction access road shown in blue. Oakdale West shown in red.

1.2 Objectives of the CNVMP

The objectives of this CNVMP are as follows:

- Document the statutory requirements applicable to construction noise and vibration emissions;
- Detail the mitigation and management measures required achieve compliance with relevant noise and vibration criteria for surrounding sensitive receivers;
- Outline the roles and responsibilities in relation to the management of noise and vibration emissions during construction; and
- Promote environmental awareness among employees and subcontractors.

This CNVMP covers construction of the WNSLR. Construction of the Oakdale West Estate is covered in a separate CNVMP.

1.3 Terminology

Specific acoustic terminology is used in this report. An explanation of common acoustic terms is provided in **Appendix A**.

2 Statutory Requirements

This CNVMP has been prepared to accompany the Construction Environmental Management Plan (CEMP) for the WNSLR. The conditions relevant to this CNVMP are outlined in the following sections.

2.1 Development Consent

Conditions for Oakdale West and the WNSLR are specified in Department of Planning, Industry and Environment (DPIE) Development Consent SSD 7348, dated 13 September 2019. The conditions relevant to this CNVMP are reproduced in **Table 1**.

Table 1 Development Consent Conditions

Development Consent Conditions		Section / Comment
Operation of Plant and Equipment		
D21. All plant and equipment used on site, or to monitor the performance of Stage 1 must be: a) maintained in a proper and efficient condition; and b) operated in a proper and efficient manner.		Section 6 / Table 15
Hours of Work		
D70. The Applicant must comply with the hours detailed in Table 5, unless otherwise agreed in writing by the Planning Secretary. Table 5: Hours of Works		Section 3.5
Activity	Day	Time
Construction	Monday – Friday	7 am to 6 pm
	Saturday	8 am to 1 pm
Operation	Monday – Sunday (including public holidays)	24 hours
D71. Works outside the hours identified in Condition D70 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 Planning 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 or to prevent environmental harm.		Section 3.5
Construction Noise Limits		
D72. Stage 1 must be constructed with the aim of achieving the construction noise management levels detailed in the <i>Interim Construction Noise Guideline</i> (DECC, 2009) (as may be updated or replaced from time to time). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the Construction Noise and Vibration Management Plan required by Condition D73.		Section 4.1, Section 5.1 and Section 6 / Table 15

Development Consent Conditions	Section / Comment
Construction Noise and Vibration Management Plan	
D73. The Applicant must prepare a Construction Noise and Vibration Management Plan (CNVMP) for Stage 1, to the satisfaction of the Planning Secretary. The CNVMP must form part of a CEMP in accordance with Condition D119 and must:	This document
a) be prepared by a suitably qualified and experienced noise expert;	Prepared by SLR – Author CV in Appendix B
b) describe procedures for achieving the noise management levels in the EPA's <i>Interim Construction Noise Guideline</i> (DECC, 2009) (as may be updated or replaced from time to time);	Section 4.1, Section 5.1 and Section 6 / Table 15
c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;	Section 6 / Table 15
d) include strategies to minimise impacts to sensitive receivers, including, where practicable, starting noisy equipment away from sensitive receivers and implementing respite periods;	Section 6 / Table 15 and Section 8
e) include strategies that have been developed with the sensitive receivers identified in Appendix 5 for managing high noise generating works;	Section 6 / Table 15 and Section 8
f) describe the community consultation undertaken to develop the strategies in Condition D73(e);	Section 6 / Table 15, Section 8 and the Community Communication Strategy (CCS)
g) include a monitoring program that: <ul style="list-style-type: none"> i) includes a protocol for determining exceedances of the relevant conditions in this approval; ii) evaluates and reports on the effectiveness of the noise and vibration management measures; iii) include procedures to relocate, modify, mitigate or stop work to ensure compliance with the relevant criteria; and 	Section 6 / Table 15, Section 8, Section 9 and the Compliance Monitoring and Reporting Program (CMRP)
h) include a complaints management system that would be implemented for the duration Stage 1.	Section 7
D74. The Applicant must:	
a) not commence construction of Stage 1 until the CNVMP required by Condition D73 is approved by the Planning Secretary; and;	Section 3.4
b) implement the most recent version of the CNVMP approved by the Planning Secretary for the duration of construction.	This document
Vibration Criteria	
D76. Vibration caused by construction works on the site, as measured at any residence or structure outside the site, must be limited to:	Section 4.2, Section 5.2 and Section 6 / Table 15
a) for structural damage, the latest version of <i>DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures</i> (German Institute for Standardisation, 1999); and	
b) for human exposure, the acceptable vibration values set out in the <i>Environmental Noise Management Assessing Vibration: a technical guideline</i> (DEC, 2006) (as may be updated or replaced from time to time).	

Development Consent Conditions	Section / Comment
D77. Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in Condition D76.	Section 4.2.3, Section 5.2 and Section 6 / Table 15 (there are no residential receivers within this distance)
D78. The limits in Conditions D76 and D77 apply unless otherwise outlined in a CNVMP, approved as part of the CEMP required by Condition D119 of this consent.	Noted – D76 and D77 apply
Management Plan Requirements	
D118. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	Noted
a) details of: <ul style="list-style-type: none"> i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); ii) any relevant limits or performance measures and criteria; and iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; 	<ul style="list-style-type: none"> i) Section 2 ii) Section 4 iii) Section 4, Section 6 / Table 15 and Section 8
b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 5 and Section 6 / Table 15
c) a program to monitor and report on the: <ul style="list-style-type: none"> i) impacts and environmental performance of Stage 1; and ii) effectiveness of the management measures set out pursuant to paragraph (b) above; 	Section 8
d) 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;	Section 6 and Section 9
e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time;	Section 11, and Section 6 of the CEMP
f) a protocol for managing and reporting any: <ul style="list-style-type: none"> i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); ii) complaint; iii) failure to comply with statutory requirements; and 	<ul style="list-style-type: none"> i) Section 9 ii) Section 7 iii) Section 9
g) a protocol for periodic review of the plan.	Section 11, and Section 6 of the CEMP

2.2 Roads and Maritime QA Specification

Additional requirements for the project are detailed in Roads and Maritime Services (Roads and Maritime) *QA Specification G36 – Environmental Protection*, dated November 2018. The requirements relevant to this CNVMP are reproduced in **Table 2**.

Table 2 QA Specification G36 Conditions

G36 Conditions	Section / Comment
3.6 Working Hours	
In the context of this clause, normal working hours are from Monday to Friday between 7:00 am to 6:00 pm and Saturday between 8:00 am to 1:00 pm inclusive, but excluding public holidays.	Section 3.5
The CEMP must include a procedure for notifying the Principal, all relevant Authorities and the community, in advance of any proposal to work outside of these working hours. Such changes in working hours must comply with all licences, permits, approvals, consents, notification, statutory requirements, etc and have been appropriately justified and assessed.	Refer to the CCS
Any approval by the Principal to work outside of normal working hours is conditional on you liaising with the community (refer to Clause 3.7) and complying with the requirements of Clause 4.6. and complying with the requirements of the EPL.	Refer to the CCS
Work outside of normal working hours is permitted without prior approval by the Principal in the following circumstances: a) delivery of materials outside of normal working hours, where delivery at such times is required by the Police or other authorities for reasons of safety or otherwise; or b) work during an emergency, where such work is necessary to avoid the loss of lives, property and/or prevent environmental harm.	Section 3.5
4.6 Noise Control	
Prepare and implement a Construction Noise and Vibration Management Sub-Plan as part of the CEMP, to minimise the impact of noise from your operations on adjacent properties. The Construction Noise and Vibration Management Sub-Plan must include proposed environmental control measures for all significant noise generating activities, including:	This document
a) conduct a quantitative noise assessment for all works in accordance with the 'Interim Construction Noise Guidelines' (DECCW, 2009);	Section 4.1 and Section 5.1
b) a process for assessing the performance of the implemented mitigation measures;	Section 8
c) a noise monitoring program for sensitive receivers;	Section 8
d) provision for additional control measures if you cannot meet compliance with noise and vibration criteria; and	Section 9
Refer to the requirements of the EPA publication "Interim Construction Noise Guideline", RMS publication "Environmental Noise Management Manual" (in particular Practice Note vi), "Environmental fact sheet No. 2 – Noise management and Night Works" and RMS Construction Noise Guidelines (CNG), 2016 when considering the environmental control measures and practices to be included in the Construction Noise and Vibration Management Sub-Plan.	Section 6 / Table 15
Where Works are proposed to be undertaken outside of normal working hours, comply with the requirements of Clause 3.7.2.	Section 3.5 and Section 6 / Table 15

G36 Conditions	Section / Comment
All construction plant and equipment used on Site must be, in addition to other requirements: a) fitted with properly maintained noise suppression devices in accordance with the manufacturer's specifications; b) regularly inspected and maintained in an efficient condition; c) operated in a proper and efficient manner.	Section 6 / Table 15
Your Construction Noise and Vibration Management Sub-Plan must outline the management measures to be used to avoid, minimise or mitigate construction noise.	Section 6 / Table 15
4.7 Ground Vibration and Airblast	
Blasting is not permitted.	Blasting is not proposed
Implement all measures to prevent damage to adjacent public utilities, structures and buildings resulting from construction vibration.	Section 6 / Table 15
Meet the requirements of EPA <i>"Environmental Noise Management Assessing Vibration: A Technical Guideline"</i> . Where the requirements are likely to be exceeded, manage the impacts in consultation with, and in accordance with, the requirements stipulated by EPA.	Section 4.2, Section 5.2 and Section 6 / Table 15
To reduce the potential for structural damage, carry out construction activities in accordance with the requirements of BS 7385 and German Standard DIN 4150:1999 – <i>Structural Vibrations in Buildings</i> .	Section 4.2, Section 5.2 and Section 6 / Table 15
Where there is a risk that vibration activities may cause damage to nearby structures and buildings or if these are located within the distance from the construction activity specified in Annexure G36/E, undertake a building condition inspection at least three (3) weeks before the construction activity commences and provide a copy to the Principal and the land owner and prepare a Building Condition Inspection Report for every property or structure likely to be affected.	Section 6 / Table 15
The Building Condition Inspection Reports must contain photographs of the inspected properties and include details of the inspectors' qualification and expertise, together with a list of any identified defects, where relevant. The reports must be submitted to the owner of each property and to the Principal before the commencement of any activities as outlined in the Hold Point below.	Section 6 / Table 15
Prepare, as part of the CEMP, a Construction Noise and Vibration Management Sub-Plan as part of the CEMP, that describes the environmental controls to be implemented during construction to minimise the impact of vibration and airblast on adjacent properties and residents.	This document
The Construction Noise and Vibration Management Sub-Plan must detail how construction vibration will be managed for various plant items working adjacent to buildings. Keep records as evidence of compliance with these construction vibration restrictions.	Section 6 / Table 15 and Section 8
Where blasting is not required for the Work Under the Contract, vibration mitigation and management measures may be incorporated into a combined Construction Noise and Vibration Management Sub-Plan.	Blasting is not proposed

G36 Conditions	Section / Comment														
<p>HOLD POINT</p> <p>Process Held: Commencement of piling, excavation by hammering or ripping, dynamic compaction, demolition operations, or any other activity which may cause damage through vibration.</p> <p>Submission Details: At least 10 working days prior, submit to the Principal a copy of the Building Condition Inspection Reports and the Vibration Management Sub-Plan or the combined Noise and Vibration Management Sub-Plan (where blasting is not required).</p> <p>Release of Hold Point: The Principal will consider the submitted documents prior to authorising the release of the Hold Point. The Principal may request additional information in respect of the proposal and/or submitted documents.</p>	Section 6 / Table 15														
You are liable for any accident or damage to any property, person, or thing resulting from vibration from construction activity.	Noted														
Annexure G36/E – Distance from Construction Activity for Building Condition Inspection															
<p>Refer to Clause 4.7.</p> <p>Carry out a Building Condition Inspection for each public utility, structure and building within the distance from the appropriate activity listed below; however, where the risk of damage to an item is assessed to be very low, the requirement for a Building Condition Inspection may be waived with the Principal's agreement.</p> <table border="1"> <thead> <tr> <th>Activity</th><th>Distance</th></tr> </thead> <tbody> <tr> <td>Blasting Operations</td><td>N/A</td></tr> <tr> <td>Pile Driving</td><td>To be confirmed with WaterNSW</td></tr> <tr> <td>Excavation by hammering or ripping</td><td>N/A</td></tr> <tr> <td>Vibrating Compaction >7 tonne plant</td><td>50 metres</td></tr> <tr> <td>Vibrating Compaction <7 tonne plant</td><td>50 metres</td></tr> <tr> <td>Demolition of Structures</td><td>N/A</td></tr> </tbody> </table>	Activity	Distance	Blasting Operations	N/A	Pile Driving	To be confirmed with WaterNSW	Excavation by hammering or ripping	N/A	Vibrating Compaction >7 tonne plant	50 metres	Vibrating Compaction <7 tonne plant	50 metres	Demolition of Structures	N/A	Section 6 / Table 15
Activity	Distance														
Blasting Operations	N/A														
Pile Driving	To be confirmed with WaterNSW														
Excavation by hammering or ripping	N/A														
Vibrating Compaction >7 tonne plant	50 metres														
Vibrating Compaction <7 tonne plant	50 metres														
Demolition of Structures	N/A														

2.3 Relevant Guidelines

The guidelines used to assess the construction impacts from the development are listed in **Table 3**. The guidelines aim to protect the community and environment from excessive noise and vibration impacts that may result from construction of the development.

Table 3 Construction Noise and Vibration Guidelines

Guideline/Policy Name	Where Used
Environment Protection Authority (EPA) (2009) <i>Interim Construction Noise Guideline</i> (ICNG)	Assessment of noise impacts on sensitive receivers.
Roads and Maritime Services (2016) <i>Construction Noise and Vibration Guideline</i> (CNVG)	Assessment and management protocols for noise and vibration impacts.
Environment Protection Authority (EPA) (2006) <i>Assessing Vibration: a technical guideline</i>	Assessment of vibration impacts on sensitive receivers.
British Standard Institution (BSI) (1993) <i>BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2</i> (BS 7385)	Assessment of vibration impacts (structural damage) to sensitive structures.
German Institute for Standardisation (Deutsches Institut für Normung) (1999) <i>DIN 4150 – Structural vibration - Effects of vibration on structures</i> (DIN 4150)	Assessment of vibration impacts (structural damage) to sensitive structures.

3 Project Overview

3.1 Description

The WNSLR is approximately 1.3 km in length and 30 m wide, and provides a link between Oakdale West, Lenore Drive to the north and the future Southern Link Road to the south. The corridor will be bound by Fitzpatrick land on both sides of the corridor for the norther portion, WaterNSW land on both sides of the corridor for the middle portion, Goodman land to the west and the existing Transgrid easement to the east for the southern portion. A WaterNSW pipeline intersects the proposed WNSLR alignment, therefore a bridge is to be constructed over the pipeline. A Construction Access Road will also be constructed by Robson which connects Bakers Lane to the WNSLR.

3.2 Location

Located in the Penrith local government area (LGA) at the far south western extent of the WSEA, the WNSLR is made up of the following five land parcels legally described as:

- Lot 3031, DP 1168407 (owned by Fitzpatrick Investments);
- Lot 6, DP 229784 (owned by WaterNSW);
- Lot 2, DP 84578 (owned by WaterNSW);
- Lot 3, DP 85393 (owned by WaterNSW); and
- Lot 11, DP1178389 (owned by Goodman).

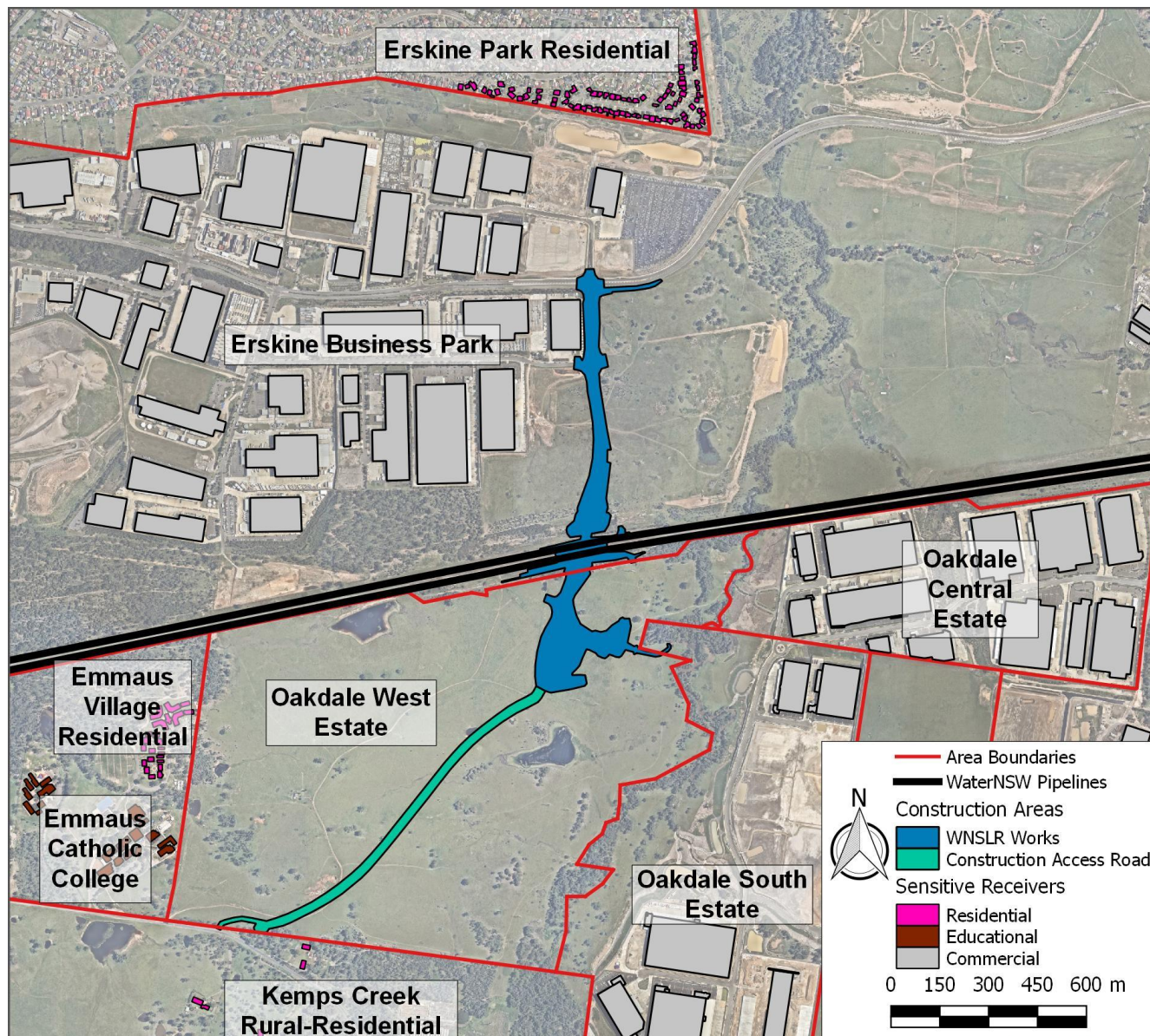
3.3 Surrounding Land Uses

The noise and vibration assessment locations representative of the nearest sensitive receiver areas surrounding the WNSLR were identified in the NIA for the project and are shown in **Figure 3**. Details of the nearest potentially affected sensitive receivers are provided in **Table 4**.

Table 4 Surrounding Sensitive Receivers

Sensitive Receivers	Receiver Type	Distance & Direction from Nearest Point of Works
Erskine Park	Residential	470 m north of main works, 1,700 m north of access road works
Emmaus Village	Residential	1,050 m west of main works, 460 m northwest of access road works
Kemps Creek	Residential	1,050 m southwest of main works, 75 m south of access road works
Emmaus Catholic College	Educational	1,200 m southwest of main works, 250 m northwest of access road works
Erskine Business Park	Commercial	10 m west of main works, 660 m north of access road works
WaterNSW Pipeline	Structure	Within footprint of main works, 370 m north of access road works

Figure 3 Sensitive Receiver Areas



3.4 Construction Staging and Activities

In accordance with Condition D74 construction of Stage 1 must not commence until this CNVMP has been approved by the Planning Secretary.

Stage 1 development of the Oakdale West Concept Proposal includes the site preparation and infrastructure works required to facilitate further development of the estate in line with the Concept Proposal. This includes the construction of the WNSLR and connection to the estate road network along with the development of Precinct 1 for warehousing and distribution.

WNSLR includes the construction of the following intersections:

- A 4-leg signalised intersection with Lenore Drive, providing access to the regional road network and a local connection;
- A 4-leg roundabout with Lockwood Road (previously a cul-de-sac), providing a local connection between WNSLR and Templar Road as well as providing a connection for a local road supporting development to the east, comprising the balance of Fitzpatrick lands;
- A 3-leg roundabout to a T-junction to Estate Road 1, providing primary access to Oakdale West and will be the sole access provided to Precincts 1 - 4 until the completion of the SLR; and
- A full road construction with temporary line marking between Estate Road 1 and the future Southern Link Road to provide connection in advance of the Southern Link Road.

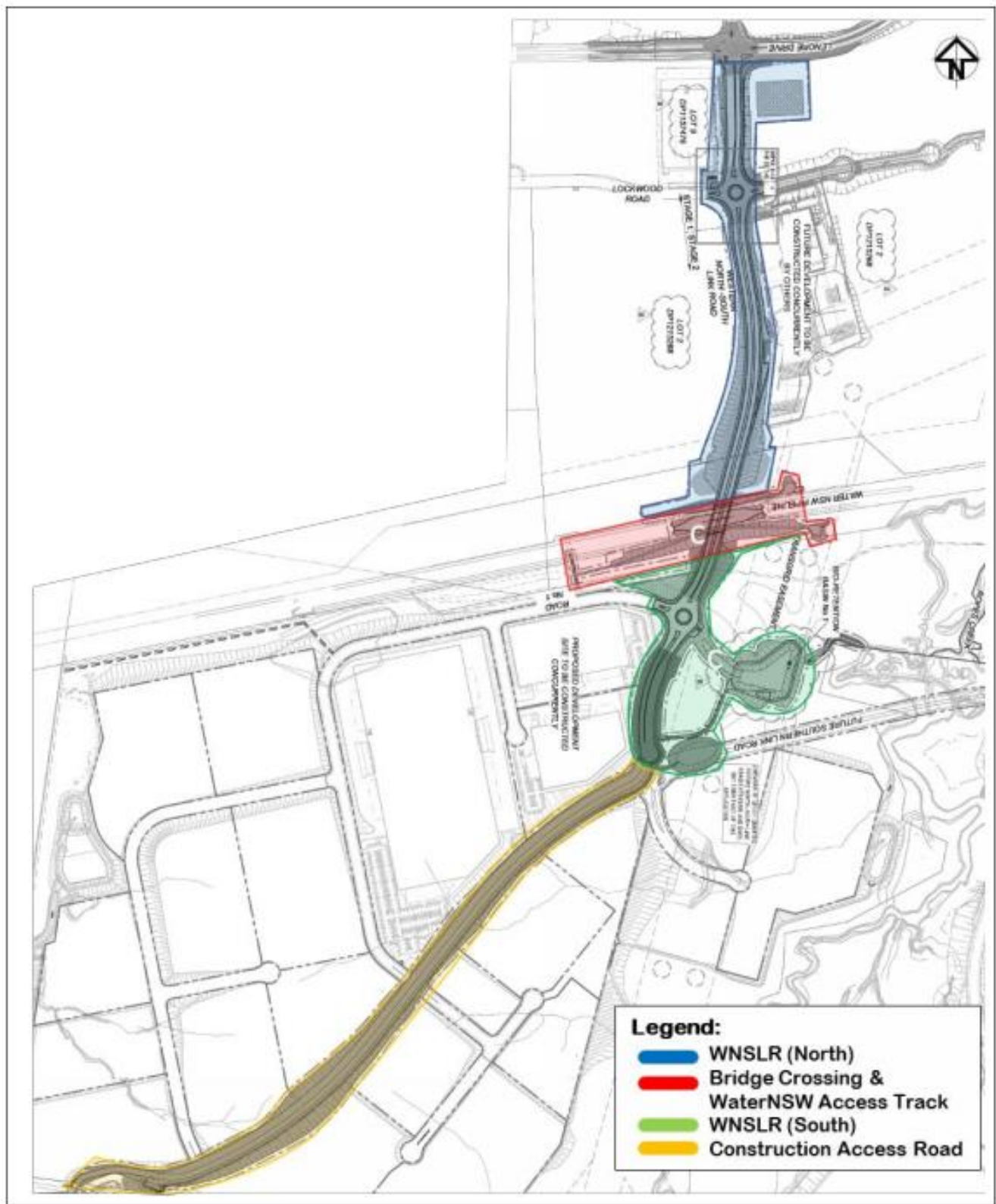
WNSLR also includes the construction of the Construction Access Road along the future Southern Link Road alignment through Oakdale West. The WNSLR also includes the construction of Bio-retention Basin 1.

Construction is scheduled to commence in late October 2019 (earlier if possible, subject to all post-approval requirements). Robson estimate the construction program to take approximately 50 weeks, subject to any delays during construction (i.e. wet weather or authority delays) which may increase the duration of the works.

Construction of the Construction Access Road (see **Figure 4**) will be undertaken first and will take approximately 12-16 weeks. All other work zones will be constructed concurrently until completion of the project.

As part of the bridge construction, earthworks are required on either side of both WaterNSW pipelines. This work includes lowering the existing access track between the pipes to provide the necessary clearance under the bridge, as well reshaping the existing outside batters to provide access to the bridge abutments for maintenance.

Figure 4 Construction Work Zones



3.5 Construction Hours

Construction hours will be in accordance with Conditions D70 and D71 of Development Consent SSD 7348, which are reproduced below:

D70. The Applicant must comply with the hours detailed in Table 5, unless otherwise agreed in writing by the Planning Secretary.

Table 5: Hours of Work

Activity	Day	Time
Construction	Monday – Friday	7 am to 6 pm
	Saturday	8 am to 1 pm

D71. Works outside of the hours identified in Condition D70 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 Planning 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 or to prevent environmental harm.*

Additionally, Section 3.6 of the G36 specification lists the same construction hours set out in SSD 7348. G36 states that work outside of standard construction working hours is permitted without prior approval in the following circumstances:

- Delivery of materials outside of normal working hours, where delivery at such times is required by the Police or other authorities for reasons of safety or otherwise; or
- Work during an emergency, where such work is necessary to avoid the loss of lives, property and/or prevent environmental harm.

Condition D71(a) of Development Consent SSD 7348 notes that works may be undertaken outside of standard construction hours where the works are inaudible at the nearest sensitive receivers. Out of hours works can be undertaken without requiring approval from the Planning Secretary where it can be demonstrated that works will not be audible at any sensitive receivers.

The potential for audible impacts can be assessed by calculating predicted noise levels with a construction noise model, or by undertaking test measurements during a period with similar background noise levels to the proposed works period (noting that audibility is subjective and dependent on the background noise level at the time of the works). The predictions/measurements must be confirmed at the commencement of works with attended noise monitoring at the nearest sensitive receivers. These predictions and measurements will be undertaken by a suitably qualified acoustic consultant.

In accordance with Condition D71(b) of Development Consent SSD 7348, where works are required out of hours and noise is predicted to be audible at the nearest receivers, then written approval from the Planning Secretary must be received prior to commencement of works, except where the works fall under Conditions D71(c) or D71(d).

3.6 Construction Site Access

The construction of the WNSLR will occur in accordance with the construction staging details in **Section 3.4**. In accordance with the Construction Traffic Management Plan (CTMP) (Ason 2019), **Table 4** details the site access arrangements for the applicable work zones shown in **Figure 4**.

Table 5 Site Access

Work Zones	Access Arrangement
Construction Access Road	Via Bakers Lane.
WNSLR (North)	Primary access via Lockwood Road to facilitate all movement access to Lenore Drive. Left-in, left-out access to Lenore Drive.
Bridge Crossing	<ul style="list-style-type: none"> Northern section – to/from Lenore Drive via Lockwood Road. Central section: <ul style="list-style-type: none"> Entry from Mamre Road exit from Old Wallgrove Rd, under an approved Traffic Control Plan (to be submitted by Robson). Central section entry from Old Wallgrove Rd, under a right-in-left-out arrangement and with an approved Traffic Control Plan (to be submitted by Robson). Southern section – to/from Mamre Road via Bakers Lane.
WNSLR (South)	In the short term, access will be to/from Mamre Road via Bakers Lane. Upon completion of the Bridge Crossing works, additional access shall be to Lenore Drive via the WNSLR.

4 Construction Noise and Vibration Criteria and Guidelines

4.1 Construction Noise Criteria

In accordance with Condition D72 of the Development Consent SSD 7348, the WNSLR must be constructed with the aim of achieving the construction noise management levels (NMLs) detailed in the NSW *Interim Construction Noise Guideline* (ICNG). Explanation of what constitutes feasible and reasonable is outlined in Section 1.4 of the ICNG.

The ICNG process to determine NMLs is detailed in **Section 4.1.1**. The project specific noise criteria is summarised in **Section 4.1.2**.

4.1.1 Interim Construction Noise Guideline

The ICNG requires project specific NMLs to be established for noise affected receivers. The NMLs are not mandatory limits, however in the event construction noise levels are predicted to be above the NMLs, feasible and reasonable work practices are to be investigated to minimise noise emissions.

The ICNG provides an approach for determining NMLs at residential receivers based on Rating Background Level (RBL) for the area, as described in **Table 6**.

Table 6 Determination of NMLs for Residential Receivers

Time of Day	NML LAeq(15minute)	How to Apply
Standard construction hours Monday to Friday 7:00 am to 6:00 pm Saturday 8:00 am to 1:00 pm No work on Sundays or public holidays	RBL + 10 dBA	<ul style="list-style-type: none"> The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practises to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dBA	<ul style="list-style-type: none"> The Highly Noise Affected (HNA) level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restructuring the hours that the very noisy activities can occur, taking into account: <ul style="list-style-type: none"> Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Time of Day	NML LAeq(15minute)	How to Apply
Outside recommended standard construction hours	RBL + 5 dBA	<ul style="list-style-type: none"> A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practises have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.

Note 1 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*.

Works are recommended to be completed during Standard Construction Hours where possible. More stringent requirements are placed on works that are required to be completed outside of Standard Construction Hours (ie during the evening or night-time) which reflects the greater sensitivity of communities to noise impacts during these periods.

The ICNG also recognises other kinds of noise sensitive receivers and provides recommended NMLs for them. Those specific receivers and their recommended noise levels are presented in **Table 7**.

Table 7 Construction Noise Management Levels at Other Sensitive Land Uses

Land use	NML LAeq(15minute)
Classrooms at schools and other educational institutions	Internal noise level 45 dBA
Hospital wards and operating theatres	Internal noise level 45 dBA
Places of worship	Internal noise level 45 dBA
Active recreation areas (characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion)	External noise level 65 dBA
Passive recreation areas (characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example, reading, meditation)	External noise level 60 dBA
Community centres	Depends on the intended use of the centre

The ICNG notes that due to the broad range of sensitivities that commercial or industrial land can have to noise from construction, the process of defining management levels is separated into three categories:

- Industrial premises: external 75 dBA LAeq(15minute)
- Offices, retail outlets: external 70 dBA LAeq(15minute)
- For other businesses that may be very sensitive to noise, appropriate goals should be determined on a case by case basis with reference to Australian/New Zealand Standard *AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors* (AS2107).

4.1.2 Project Specific NML Summary

The NIA defined the airborne NMLs for the various surrounding receivers. The NMLs applicable for the receivers surrounding the WNSLR are outlined in **Table 8**.

Table 8 Project Specific Noise Management Levels

Location	Receiver Type	RBL ¹			Construction NMLs LAeq(15minute) (dBA)	
		Day	Evening	Night	Standard Construction Hours ²	Highly Noise Affected
Erskine Park Residential	Residential	37	40	39	47	75
Emmaus Village Residential	Residential	39	38	36	49	
Kemps Creek Residential	Residential	34	35	32	44	
Any	Industrial	n/a			External 75 when in use	n/a
Any	Commercial	n/a			External 70 when in use	
Any	School ³	n/a			External 55 when in use	

Note 1: RBL Periods – Day: 7:00 am to 6:00 pm Monday to Saturday, 8:00 am to 6:00 pm Sunday; Evening: 6:00 pm to 10:00 pm; Night: 10:00 pm to 7:00 am Monday to Saturday, 10:00 pm to 8:00 am Sunday.

Note 2: Standard construction hours 7:00 am to 6:00 pm (Monday to Friday), 8:00 am to 1:00 pm (Saturday) (refer to **Section 3.5**).

Note 3: External criteria equivalent to internal criteria plus 10 dB.

As noted in **Table 6**, where the predicted or measured LAeq(15minute) construction noise levels exceed the NMLs for Standard Construction Hours in **Table 8**, all feasible and reasonable work practises will be applied with the aim of meeting the NMLs.

Where the predicted or measured construction noise levels are above the highly noise affected criteria (ie 75 dBA), the DPIE may require respite periods by restructuring the hours that the noisy activities can occur.

Predicted construction noise levels are discussed in **Section 5.1**.

4.2 Construction Vibration Criteria

In accordance with Condition D76 of the Development Consent SSD 7348, vibration from construction works on the site, as measured at any residence or sensitive structure, must be limited to the criteria outlined in:

- For structural damage – German Standard *DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures* (DIN 4150); and
- For human exposure, the EPA's *Assessing Vibration: a technical guideline*.

Section 4.7 of the G36 specification references DIN 4150 and British Standard *BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2* (BS 7385) with regards to reducing the potential for structural damage, and *Assessing Vibration: a technical guideline* with regards to reducing the potential for human exposure.

Structural damage criteria is detailed in **Section 4.2.1** and human exposure criteria is detailed in **Section 4.2.2**.

Minimum working distances based on these criteria are summarised in **Section 4.2.3**.

4.2.1 Cosmetic Damage Vibration Thresholds

British Standard BS 7385

The recommended vibration limits from BS 7385 for transient vibration for minimal risk of cosmetic damage to residential and industrial buildings are shown in **Table 9**. These levels are judged to give a minimum risk of vibration-induced damage, where minimal risk is usually taken as a 95% probability of no effect.

Table 9 Transient Vibration Guide Values for Minimal Risk of Cosmetic Damage (BS 7385)

Line	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
2	Unreinforced or light framed structures	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

German Standard DIN 4150-3

For continuous long-term vibration or repetitive vibration with the potential to cause fatigue effects, DIN 4150 provides the following Peak Particle Velocity (PPV) values as safe limits, below which even superficial cosmetic damage is not to be expected:

- 10 mm/s for commercial buildings and buildings of similar design.
- 5 mm/s for dwellings and buildings of similar design.
- 2.5 mm/s for buildings of great intrinsic value (eg heritage listed buildings).

For short-term vibration events (ie those unlikely to cause resonance or fatigue), DIN 4150 offers the criteria shown in **Table 10**. These are maximum levels measured in any direction at the foundation or in the horizontal axes in the plane of the uppermost floor.

Table 10 Guideline Values for Short-term Vibration on Structures (DIN 4150)

Group	Type of Structure	Guideline Values Vibration Velocity (mm/s)				
		Foundation, All Directions at a Frequency of			Topmost Floor, Horizontal	Floor Slabs, Vertical
		1 to 10 Hz	10 to 50 Hz	50 to 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
3	Structures that, because of their particular sensitivity to vibration, cannot be classified as Group 1 or 2 and are of great intrinsic value (eg listed buildings)	3	3 to 8	8 to 10	8	20 ¹

Note 1: It may be necessary to lower the relevant guideline value markedly to prevent minor damage.

The “*safe limits*” given in DIN 4150 are the levels up to which no damage due to vibration effects has been observed for the particular class of building. “*Damage*” is defined by DIN 4150 to include even minor non-structural effects such as superficial cracking in cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls.

4.2.1.1 WaterNSW Pipelines

The WNSLR passes over WaterNSW pipelines. The pipelines are installed above ground and are supported on reinforced concrete saddles. The standards for vibration damage (refer to **Section 4.2.1**) do not cater for structures similar to the pipelines construction.

PSM Consult Pty Ltd have completed an assessment of the WNSLR bridge (letter report PSM1541-381L, dated April 2019, refer to **Appendix C**), which recommends a criteria of 15 mm/s PPV for the pipeline during construction of the bridge. Advice from WaterNSW has confirmed this is to be used as the vibration limit for the pipelines in the project area.

4.2.2 Human Exposure Vibration Thresholds

The EPA’s *Assessing Vibration: a technical guideline* provides guideline values for continuous, transient and intermittent events that are based on a Vibration Dose Value (VDV) rather than a continuous vibration level. The VDV is dependent upon the level and duration of the short-term vibration event, as well as the number of events occurring during the daytime or night-time period.

The VDV’s recommended in the document for vibration of an intermittent nature (i.e. construction works where more than three distinct vibration events occur) are presented in **Table 11**.

Table 11 Acceptable Vibration Dose Values for Intermittent Vibration ($\text{m/s}^{1.75}$) (*Assessing Vibration: a technical guideline*)

Location	Daytime ¹		Night-time ¹	
	Preferred Value	Maximum Value	Preferred Value	Maximum Value
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

Note 1: Daytime is 7:00 am to 10:00 pm and night-time is 10:00 pm to 7:00 am.

4.2.3 Minimum Working Distances

Recommended minimum working distances for vibration intensive construction plant based on the BS 7385, DIN 4150 and *Assessing Vibration: a technical guideline* are referenced from the Roads and Maritime *Construction Noise and Vibration Guideline* (CNVG). These minimum working distances are summarised in **Table 12**.

The minimum working distances are based on empirical data which suggests that where works are further from receivers than the quoted minimum distances then impacts are not considered likely.

The minimum working distances are indicative and will vary depending on the particular item of equipment and local geotechnical conditions. The distances apply to cosmetic damage of typical building under typical geotechnical conditions.

Table 12 Recommended Minimum Working Distances for Vibration Intensive Equipment

Plant Item	Rating / Description	Minimum Distance		
		Cosmetic Damage		Human Response (NSW EPA Guideline) ¹
		Residential and Light Commercial (BS 7385) ¹	Heritage Items (DIN 4150 Group 3) ²	
Vibratory Roller	< 50 kN (Typically 1-2t)	5 m	11 m	15 m to 20 m
	< 100 kN (Typically 2-4t)	6 m	13 m	20 m
	< 200 kN (Typically 4-6t)	12 m	15 m	40 m
	< 300 kN (Typically 7-13t)	15 m	31 m	100 m
	> 300 kN (Typically 13-18t)	20 m	40 m	100 m
	> 300 kN (Typically > 18t)	25 m	50 m	100 m
Small Hydraulic Hammer	300 kg – 5 to 12t excavator	2 m	5 m	7 m
Medium Hydraulic Hammer	900 kg – 12 to 18t excavator	7 m	15 m	23 m
Large Hydraulic Hammer	1600 kg – 18 to 34t excavator	22 m	44 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	5 m to 40 m	20 m
Pile Boring	≤ 800 mm	2 m (nominal)	5 m	4 m
Jackhammer	Hand held	1 m (nominal)	3 m	2 m

Note 1: Criteria reference from Roads and Maritime CNVG.

Note 2: Criteria reference from DIN 4150.

In addition to the above minimum working distances, Condition D77 of the Development Consent SSD 7348 specifies that vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in Condition D76. It is noted that no residential receivers are located within 30 metres of the WNSLR works.

5 Construction Noise and Vibration Impacts

5.1 Construction Noise Impacts

The WNSLR NIA presented construction noise predictions from a number of construction scenarios likely to occur on site. These construction scenarios are representative of a number of activities which will be required during the construction of the site.

Table 13 details the construction scenarios assessed in the NIA together with a list of activities considered to be represented by those scenarios.

Table 13 Construction Scenarios

NIA Construction Scenario	Relevant Activities
Site Clearing and Earthworks	Site set up including environmental controls, bulk earthworks and spoil removal
Paving Works including concrete pours	Detailed earthworks Installation of underground services (stormwater, fire service, sewer, water service) Reinforced concrete ground and external paving
Construction of Roadways	Laying of road surface Roadway compacting and smoothing Line marking and finishing works Establishment of Construction Access Road
Construction of bridge structure	Piling Works Installation of supporting structures Installation of roadway
Landscaping and finishing works	Landscaping

The predicted worst-case noise levels and the exceedances of the NMLs from the various construction works at the WNSLR are presented in **Table 14**.

Table 14 Predicted NML Exceedances

Receiver	LAeq(15minute) Construction Noise Levels (dBA)							
	Worst-case Predicted (any scenario)	NML (Standard Construction Hours)	NML Exceedance (Standard Construction Hours) ¹					
			Site Clearing	Paving Works	Roadway Construction	Bridge Structure Construction	Landscaping	Construction Access Road
Erskine Park Residential	45	47	-	-	-	-	-	-
Emmaus Village Residential	42	49	-	-	-	-	-	-
Kemps Creek Residential	62	44	-	-	-	-	-	18
School Classrooms	45	55	-	-	-	-	-	-
Commercial Premises	92	70	22	19	21	-	8	-

Note 1: Refer to **Table 13** for which construction activities are covered by each scenario.

As detailed in the NIA and shown in **Table 14** above, the construction noise impacts for the scenarios in **Table 13** are not predicted to exceed the NMLs at any existing residential sensitive receivers around the WNSLR main works during standard construction hours. Exceedance of the standard construction hours NML of up to 18 dBA is predicted at the nearest residences in Kemps Creek during establishment of the Construction Access Road when works are in the vicinity of these residences.

Exceedance of the NMLs of up to 22 dBA is predicted at the commercial premises immediately adjacent to the WNSLR construction works when works are in the vicinity of those premises.

Best practise noise management measures will be undertaken for all construction works. Additional feasible and reasonable noise mitigation and management measures will be applied for works where an exceedance of the NMLs is identified, with the aim of achieving the applicable NMLs.

Mitigation and management measures are outlined in **Section 6**.

5.2 Construction Vibration Impacts

Vibration intensive items of plant proposed for use during the construction of the project would include plate compactors, vibratory rollers, and piling rigs. These items of equipment are proposed to be used during various stages of works across the project.

During the WNSLR main works, the nearest residential and educational receivers are sufficiently distant from the works (over 450 m) to result in negligible risk of vibration impacts at these receivers. Vibratory rollers and plate compactors have the potential to be operated within the recommended minimum working distances of the closest commercial structure in the Erskine Business Park, which is located less than 20 m from the nearest point of works.

During establishment of the Construction Access Road, vibratory rollers and plate compactors have the potential to be operated within the recommended minimum working distances of the nearest receivers in Kemps Creek, which are located around 75 m from the nearest point of works.

The separation distance from these buildings will be maximised and all feasible and reasonable mitigation and management measures undertaken. Mitigation and management measures are outlined in **Section 6**.

Vibration at the nearest receivers is likely to be perceptible at times during the works when vibration intensive activities are being carried out nearby.

The WNSLR passes over WaterNSW pipelines. This will require a low bridge to be constructed which will require piling works in close vicinity to the pipelines. Excavation/cutting of the south-east batter rock within the corridor will also be required as part of these works. The PSM Consult assessment (PSM1541-381L) considers that piling, excavation and compaction works in the vicinity of the pipelines have the potential to exceed the applicable vibration limits. PSM1541-381L recommends various management measures for works adjacent to the pipelines. These measures are detailed in **Section 6**.

6 Mitigation and Management Measures

In order to minimise noise impacts during works, the construction contractor will take all reasonable and feasible measures to mitigate noise effects. Impacts from the works will be minimised and managed in accordance with the procedures detailed below in **Table 15**.

Note: **Table 15** is replicated as Table 10 and Table 13 in the CEMP.

Table 15 Environmental Management Controls for Construction Noise and Vibration

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Project Planning			
Less noise and vibration intensive construction techniques to rock breaking and concrete sawing will be used.	Robson	On going	Best practice
Works will be completed during standard daytime construction hours outlined in Section 3.5 .			
Truck routes to site will be in accordance with the approved Construction Traffic Management Plan.			
Scheduling			
Respite offers will be considered where high-noise works are predicted to exceed 75 dBA for residential receivers. For schools and retirement villages (Emmaus Village) a lower level of 65 dBA will be used to account for the sensitive daytime uses of these receivers. Respite offers will be considered for high-vibration works where the works are undertaken within the human comfort minimum working distances for all receiver types. Consultation with these receivers will be undertaken to determine appropriate respite periods, such as exam periods for schools.	Communications and Community Liaison Representative	On going	Condition D73 of SSD 7348
High-noise or vibration generating works will be carried out in continuous blocks no longer than three hours in length, with a minimum respite period of one hour between each block. ‘Continuous’ includes any period during which there is less than a one hour respite between ceasing and recommencing these works. High-noise or vibration generating works conducted outside standard construction hours (where approved) will be limited to no more than two consecutive nights except where there is a Duration Respite (see below). For night-works these periods will be separated by no less than one week, and limited to six nights per month. Where possible, high-noise and vibration generating works will be completed before 11 pm.			

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Duration Respite will be considered where it may be beneficial to the sensitive receivers to increase the duration of blocks of work or number of consecutive periods in order to complete the works more quickly. The project team will engage with the community where Duration Respite is considered in accordance with the CCS.	Communications and Community Liaison Representative	On going	Condition D73 of SSD 7348
Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night time period, any operational noise benefits from the works (where applicable) and contact telephone numbers will be undertaken in accordance with the CCS.			
Site Layout			
Compounds and worksites will be designed to promote one-way traffic and minimise the need for vehicle reversing.	Robson	On going	Best practice
Where practicable, work compounds, parking areas, and equipment and material stockpiles will be positioned away from noise-sensitive locations and take advantage of existing screening from local topography.			
Equipment that is noisy will be started away from sensitive receivers.			
Training			
Training will be provided to all personnel on noise and vibration requirements for the project. Inductions and toolbox talks to be used to inform personnel of the location and sensitivity of surrounding receivers.	Robson	On going	Best practice
Plant and Equipment Source Mitigation			
All construction plant and equipment used on Site must be, in addition to other requirements: a) fitted with properly maintained noise suppression devices in accordance with the manufacturer's specifications; b) regularly inspected and maintained in an efficient condition; c) operated in a proper and efficient manner.	Robson	On going	Condition D21 of SSD 7348 and Section 4.6 of G36 Specification
Noisy plant or processes will be replaced by less noisy alternatives. This is particularly important for piling, for example. Bored piles generate less noise than impact-driven or percussive piling methods which will be avoided if possible.			Best practice

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Where practicable, tonal reversing alarms (beepers) will be replaced with alternative silent measures (such as flashing lights) or non-tonal alarms (squawkers) on all equipment (subject to occupational health and safety requirements).	Robson	On going	Best practice
Noisy equipment will be sited 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.			
Noise generating equipment will be regularly checked and effectively maintained, including checking of hatches/enclosures regularly to ensure that seals are in good condition and doors close properly against seals.			
Dropping materials from a height will be avoided.			
Loading and unloading will be carried out away from noise sensitive areas.			
Trucks will not queue outside residential properties. Truck drivers will avoid compression braking as far as practicable.			
Truck movements will be kept to a minimum, ie that trucks are fully loaded on each trip.			
Screening			
Purpose-built acoustic screening or enclosures will be installed around long-term fixed plant such as generators in site compounds.	Robson	On going	Best practice
Community Consultation			
Notifications will be provided to the affected community where high impacts are anticipated or where out of hours works are required. Notification will be a minimum of 24 hours. Refer to the CCS.	Communications and Community Liaison Representative	On going	Best practice
Where complaints are received, work practices are to be reviewed and feasible and reasonable practices implemented to minimise any further impacts. Refer to Section 7.			
Monitoring			
Noise and/or vibration monitoring will be conducted (as appropriate) when noise/vibration intensive works are being undertaken in close proximity to sensitive receivers.	Robson	On going	Best practice
Noise and/or vibration monitoring will be conducted (as appropriate) in response to any complaints received to verify that levels are not substantially above the predicted levels.			
Refer to Section 8 for full details of monitoring requirements.			

Measure	Person Responsible	Timing / Frequency	Reference / Notes
Vibration			
Where works are required within the minimum working distances, vibration monitoring will be undertaken to confirm that vibration is within acceptable levels.	Robson	On going	Best practice
Where works are required within the cosmetic damage minimum working distances, building condition surveys will be completed before and after the works to ensure no cosmetic damage has occurred.			
Vibratory compactors will not be used closer than 30 m from residential buildings unless vibration monitoring confirms compliance with the vibration criteria.			Condition D77 of SSD 7348
A vibration limit of 15 mm/s PPV will be applied to the WaterNSW pipelines which pass under the WNSLR.			PSM Vibration Assessment PSM1541-381L (and/or requested by WaterNSW)
Any fill within the WaterNSW pipeline corridor or within 50 m of the WaterNSW pipelines (whichever is greater) will be placed and compacted using a static roller with no vibration.			
Dilapidation surveys of the pipelines will be carried out prior to the commencement and after completion, at a minimum, of any work within the WaterNSW corridor or within 50 m of the WaterNSW pipelines (whichever is greater). This will include as a minimum, collecting photos of the conditions of the site and existing pipeline and foundations, and mapping/identifying any existing issues or cracks, etc, prior to, during, and after the works.			
During construction works within the WaterNSW corridor or within 50 m of the WaterNSW pipelines (whichever is greater), and excavation/cutting of the southeast batter rock, vibration will be monitored in accordance with the procedures outlined in Section 8.2.2 .			
Vibration intensive equipment will not be used directly over the concrete encased sections of the WaterNSW pipelines.			
WaterNSW will be immediately notified in the event of any impact to the pipeline so that they can inspect the pipes prior to confirming whether any remedial work is required.			
Where there is a risk that vibration activities may cause damage to nearby structures and buildings or if these are located within the distance from the construction activity specified in Annexure G36/E, a building condition inspection will be undertaken at least three weeks before the construction activity commences, in accordance with the G36 requirements.		Before and after any vibration activities within minimum distances	Section 4.7 of G36 Specification

Measure	Person Responsible	Timing / Frequency	Reference / Notes												
The Building Condition Inspection Reports required by G36 must contain photographs of the inspected properties and include details of the inspectors' qualification and expertise, together with a list of any identified defects, where relevant. The reports must be submitted to the owner of each property and to AT&L and Goodman before the commencement of any activities as outlined in the Hold Point in Section 4.7 of G36.	Robson	Before and after any vibration activities within minimum distances	Section 4.7 of G36 Specification												
A copy of the Building Condition Inspection Reports and CNVMP must be submitted to AT&L and Goodman at least 10 working days prior to commencement of piling, excavation by hammering or ripping, compaction, demolition operations, or any activity which may cause damage through vibration.															
Carry out a Building Condition Inspection for each public utility, structure and building within the distance from the appropriate activity listed below; however, where the risk of damage to an item is assessed to be very low, the requirement for a Building Condition Inspection may be waived with AT&L and Goodman's agreement. <table><tr><th>Activity</th><th>Distance</th></tr><tr><td>Blasting Operations</td><td>N/A</td></tr><tr><td>Pile Driving</td><td>To be confirmed with WaterNSW</td></tr><tr><td>Excavation by hammering or ripping</td><td>N/A</td></tr><tr><td>Vibrating Compaction >7 tonne plant</td><td>50 metres</td></tr><tr><td>Vibrating Compaction <7 tonne plant</td><td>50 metres</td></tr><tr><td>Demolition of Structures</td><td>N/A</td></tr></table>			Activity	Distance	Blasting Operations	N/A	Pile Driving	To be confirmed with WaterNSW	Excavation by hammering or ripping	N/A	Vibrating Compaction >7 tonne plant	50 metres	Vibrating Compaction <7 tonne plant	50 metres	Demolition of Structures
Activity	Distance														
Blasting Operations	N/A														
Pile Driving	To be confirmed with WaterNSW														
Excavation by hammering or ripping	N/A														
Vibrating Compaction >7 tonne plant	50 metres														
Vibrating Compaction <7 tonne plant	50 metres														
Demolition of Structures	N/A														

Measure	Person Responsible	Timing / Frequency	Reference / Notes
EIS Measures			
Construction hours will be limited to 7:00 am - 6:00 pm Monday to Friday and 8:00 am-1:00 pm Saturdays (refer to Section 3.5).	Robson	On going	EIS mitigation commitment
Where construction noise levels are predicted to be above the NMLs, all feasible and reasonable work practices will be investigated to minimise noise emissions, as detailed in this CNVMP.			
Construction works will be conducted during Standard Construction Hours, with out of hours work minimised as far as feasible and reasonable, and undertaken in accordance with Condition D71 (refer to Section 3.5).			
Locations for vibration intensive equipment will be reviewed during the planning of construction works adjacent to the most affected receivers.			

Initial consultation has been established with all potentially affected community groups and sensitive receivers (refer to the CCS). The mitigation and management measures detailed in **Table 14** are considered to be appropriate to minimise impacts on the potentially affected receivers.

These measures will be implemented and refined as informed by the results of monitoring and ongoing community consultation.

Specific consultation with the potentially affected receivers to determine suitable respite periods and management measures will be undertaken during the planning stage of high-noise generating works once specific details of the works have been identified, such as the location of the works, activities proposed to be undertaken and required equipment.

7 Complaints Handling and Response Procedure

Details on complaints management are outlined in Section 3.6 of the overarching CEMP.

8 Monitoring

8.1 Construction Noise Monitoring

Attended noise measurements will be undertaken at the start of noise intensive works in the vicinity of sensitive receivers to verify the levels are as predicted and to check the effectiveness of mitigation and management measures used to minimise the impacts. This includes where works are adjacent to the office of the Viridian site in Erskine Business Park and where works are adjacent to the nearest residences in Kemps Creek.

Attended monitoring will also be undertaken in response to any complaints regarding construction noise. The location and extent of monitoring would be determined in consultation with AT&L, Goodman, and an acoustic consultant and would be dependent on the activities taking place.

The monitoring will take place during the expected noisiest construction periods and be representative / indicative of any impact across all potentially affected sensitive receivers.

Monitoring reports will be produced following each monitoring survey and provided to AT&L and Goodman for review. In the event that an exceedance of the applicable NMLs is measured (refer to **Section 4.1**), actions to be carried out are detailed in **Section 9**.

All items of acoustic instrumentation utilised will be designed to comply with applicable guidelines and carry current calibration certificates.

8.2 Construction Vibration Monitoring

8.2.1 Sensitive Receivers and Structures

Where vibration intensive works (such as vibratory rolling and plate compacting) are proposed to be undertaken within the minimum working distances of sensitive receivers or structures (refer to **Section 4.2.3**), vibration will be monitored continuously for the duration of works within the minimum working distances. This may be applicable to the Viridian site in Erskine Business Park and the nearest residence in Kemps Creek (on Aldington Road).

Attended vibration measurements will be undertaken at the commencement of vibration intensive works within the minimum working distances to confirm the levels of vibration are below the applicable vibration limits (refer to **Section 4.2**).

Geophones will be installed by an acoustic consultant at the closest points of the sensitive structure to the vibration intensive works to continuously monitor vibration for the duration of the works. Should the works location change, the geophones will be relocated to remain at the closest point of the structure to the works.

The vibration monitoring equipment will have visible and audible alarms installed where operators of equipment can see/hear them:

- A warning vibration level of 2/3 of the applicable vibration limit will set off the visual alarm if exceeded – the equipment operator must take care to limit vibration emissions when the warning level is exceeded.

- An exceedance vibration level equal to the applicable vibration limit will set off both the visual and audible alarms. Actions to be carried out if the exceedance alarm is set off are detailed in **Section 9**.

Monitoring data will be downloaded and reported monthly, at a minimum. Vibration monitoring reports will be prepared and provided to AT&L and Goodman for review at the following stages:

- Monthly during works (at a minimum)
- Within one week of an exceedance of the vibration limit alarm level (15 mm/s PPV)
- Upon completion of construction.

All items of vibration instrumentation utilised will be designed to comply with applicable guidelines and carry current calibration certificates.

8.2.2 WaterNSW Pipelines

The PSM Consult assessment (PSM1541-381L) recommends the following vibration monitoring for the WaterNSW pipelines. Advice from WaterNSW has confirmed that this program is to be adopted.

Vibrations impacts on the WaterNSW pipelines due to construction activities will be monitored continuously for the duration of earthworks (including excavation/cutting of the southeast batter rock) and piling works within the WaterNSW pipeline corridor to ensure vibration levels do not exceed the applicable limits (refer to **Section 4.2.1.1**).

Geophones will be installed by an acoustic consultant on top of each pipeline at the centre point between two saddles closest to the works. Baseline vibration measurements will be recorded for at least one week to determine background levels of vibration at the site prior to commencement of any works.

The vibration monitoring equipment will have visible and audible alarms installed where operators of equipment can see/hear them:

- A warning vibration level of 10 mm/s PPV will set off the visual alarm if exceeded.
- An exceedance vibration level of 15 mm/s PPV will set off both the visual and audible alarms.
- Actions to be carried out at each alarm level are detailed in **Section 9**.

Monitoring data will be downloaded and reported monthly, at a minimum. Vibration monitoring reports will be prepared and provided to AT&L and Goodman to review at the following stages:

- Prior to commencement of works (baseline report)
- Monthly during works (at a minimum)
- Within one week of an exceedance of the vibration limit alarm level (15 mm/s PPV)
- Upon completion of construction.

All items of vibration instrumentation utilised will be designed to comply with applicable guidelines and carry current calibration certificates.

9 Contingency Management Plan

The following contingency management plan, shown in **Table 16**, would be used to manage any unpredicted noise and vibration impacts and their consequences.

In the event of an incident, response will be carried out in accordance with the procedures detailed in Section 3.5 of the overarching CEMP. As detailed in Section 5.4 of the overarching CEMP, all Condition Amber and Condition Red occurrences will be recorded in the Environmental Representative Monthly Report and discussed during the toolbox talks.

The following events constitute an incident in terms of noise and vibration:

- Trigger of Condition Red for noise impacts during the standard construction hours detailed in Condition D70.
- Any works occurring outside the standard construction hours detailed in Condition D70, where those works do not meet the allowable circumstances defined in Condition D71.
- Trigger of Condition Red for vibration impacts (either at sensitive receivers locations or on WaterNSW pipelines).

Table 16 Contingency Management Plan

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Noise impacts at sensitive receiver locations	Trigger	Noise levels do not exceed applicable NMLs	Noise levels exceed applicable NMLs	Noise levels exceed Highly Noise Affected criteria (75 dBA)
	Response	On-going best practice management measures to minimise noise emissions	Undertake all feasible and reasonable mitigation and management measures to minimise noise impacts (aiming to achieve NMLs)	Undertake all feasible and reasonable mitigation and management measures to ensure noise levels are below Highly Noise Affected criteria. If noise levels cannot be kept below Highly Noise Affected criteria then a different construction method or equipment must be utilised.
Vibration impacts at sensitive receiver locations	Trigger	Vibration intensive works undertaken outside minimum working distance for the specific equipment in use	Vibration intensive works undertaken within minimum working distance for the specific equipment in use	Vibration levels exceed applicable vibration limits
	Response	On-going best practice management measures to minimise vibration emissions	Undertake vibration monitoring for the duration of the works to confirm vibration levels.	Stop work. Undertake all feasible and reasonable mitigation and management measures to ensure vibration levels are below applicable limits. If vibration levels cannot be kept below applicable limits then a different construction method or equipment must be utilised.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Vibration impacts on WaterNSW pipelines	Trigger	Monitored vibration levels on pipeline are <10 mm/s PPV	Monitored vibration levels on pipeline are 10 mm/s to 15 mm/s PPV	Monitored vibration levels on pipeline exceed 15 mm/s PPV
	Response	On-going best practice management measures to minimise vibration emissions	Care must be taken to minimise vibration levels and ensure that vibration levels do not exceed 15 mm/s PPV.	Stop work. Undertake all feasible and reasonable mitigation and management measures to ensure vibration levels are below 15 mm/s PPV. If vibration levels cannot be kept below 15 mm/s PPV then a different construction method or equipment must be utilised.

10 Roles and Responsibilities

Overall roles and responsibilities relating to the project are outlined in Section 3.2 of the overarching CEMP.

The key responsibilities specifically for noise and vibration management are as follows:

10.1 Project Manager

- Ensuring appropriate resources are available for the implementation of this CNVMP;
- Providing assistance and advice to the Site Superintendent to fulfil the requirements of this Plan, assessing data from inspections and providing project-wide advice to ensure consistent approach and outcomes are achieved;
- Providing necessary training for project personnel to cover noise and vibration management;
- Reviewing and update of this CNVMP; and
- Commissioning a suitably qualified consultant to install and maintain noise and vibration monitors and undertake any attended noise and vibration measurements required by this Plan.

10.2 Site Superintendent

- Assessing and (as required) mitigating risks of elevated noise and vibration levels before commencing works each day and ensuring that the appropriate controls are implemented and effective;
- Reviewing weather forecasts and current observations of meteorological conditions (as recorded at Horsley Park AWS);
- Throughout the day, visually assessing the dust levels and the effectiveness of any dust controls implemented, making adjustments accordingly;
- Ceasing works in the event of excessive noise and vibration generation due to noise enhancing weather conditions or inadequately controlled construction activities (eg strong winds blowing from the noise source to nearby receivers, temperature inversions, etc); and
- In the event that a noise or vibration complaint is received, the Site Superintendent will conduct an investigation in accordance with the complaint handling procedure (see **Section 7**).

10.3 All Workers on Site

- Observing any noise and vibration emission control instructions and procedures that apply to their work;
- Taking action to prevent or minimise noise and vibration emission incidents; and
- Identifying and reporting noise and vibration emission incidents.

11 Review and Improvement of the CNVMP

Details on review and improvement are outlined in Section 6 of the overarching CEMP.

12 References

- British Standard Institution (BSI) (1993) *BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2* (BS 7385)
- German Institute for Standardisation (Deutsches Institut für Normung) (1999) *DIN 4150 – Structural vibration - Effects of vibration on structures* (DIN 4150)
- Environment Protection Authority (EPA) (2006) *Assessing Vibration: a technical guideline*
- Environment Protection Authority (EPA) (2009) *Interim Construction Noise Guideline* (ICNG)
- PSM Consult Pty Ltd (2019) *WNSLR Bridge, Review and Recommendation for Allowable Vibration from Piling and Earthworks* (PSM1541-381L)
- Roads and Maritime Services (2016) *Construction Noise and Vibration Guideline* (CNVG)
- Roads and Maritime Services (2018) *QA Specification G36 – Environmental Protection*
- Roads and Traffic Authority (2001) *Environmental Noise Management Manual* (ENMM)
- SLR Consulting Australia Pty Ltd (SLR) (2016) *Western North-South Link Road DA Noise Impact Assessment* (NIA)
- Standards Australia (2004) Australian Standard AS IEC 61672.1—2004 – *Electroacoustics—Sound level meters, Part 1: Specifications*
- Standards Australia (2016) *Australian/New Zealand Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors* (AS 2107)
- Urbis (2017) *Environmental Impact Statement, Oakdale West Estate – State Significant Development Application* (EIS)

APPENDIX A

Acoustic Terminology

1. Sound Level or Noise Level

The terms 'sound' and 'noise' are almost interchangeable, except that 'noise' often refers to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure. The human ear responds to changes in sound pressure over a very wide range with the loudest sound pressure to which the human ear can respond being ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or LP are commonly used to represent Sound Pressure Level. The symbol LA represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2×10^{-5} Pa.

2. 'A' Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an 'A-weighting' filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4,000 Hz), and less sensitive at lower and higher frequencies. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as 'linear', and the units are expressed as dB(lin) or dB.

3. Sound Power Level

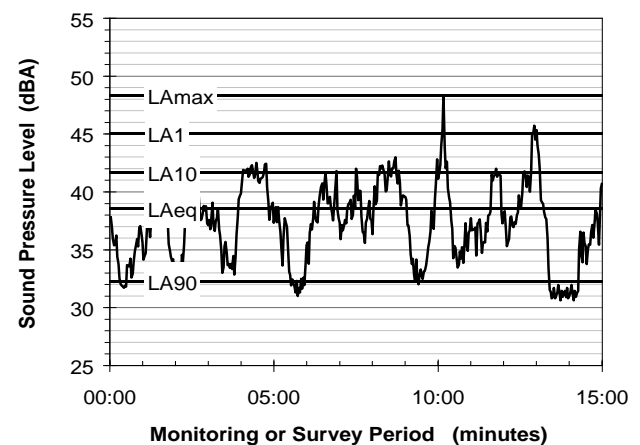
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure is similar to the effect of an electric radiator, which is characterised by a power rating but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4. Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

LA1 The noise level exceeded for 1% of the 15 minute interval.

LA10 The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

LA90 The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

LAeq The A-weighted equivalent noise level (basically, the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

5. Frequency Analysis

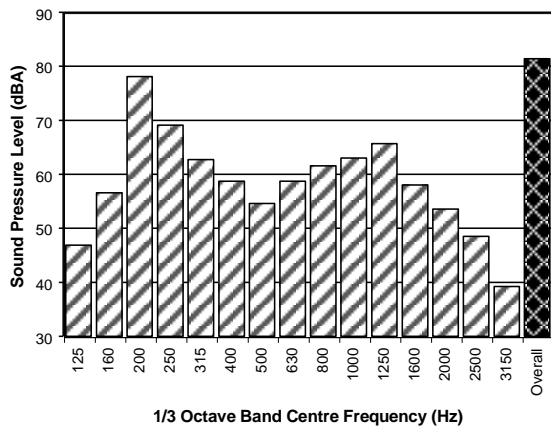
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (three bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



6. Annoying Noise (Special Audible Characteristics)

A louder noise will generally be more annoying to nearby receivers than a quieter one. However, noise is often also found to be more annoying and result in larger impacts where the following characteristics are apparent:

- **Tonality** - tonal noise contains one or more prominent tones (ie differences in distinct frequency components between adjoining octave or 1/3 octave bands), and is normally regarded as more annoying than 'broad band' noise.
- **Impulsiveness** - an impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.
- **Intermittency** - intermittent noise varies in level with the change in level being clearly audible. An example would include mechanical plant cycling on and off.
- **Low Frequency Noise** - low frequency noise contains significant energy in the lower frequency bands, which are typically taken to be in the 10 to 160 Hz region.

7. Vibration

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of 'peak' velocity or 'rms' velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as 'peak particle velocity', or PPV. The latter incorporates 'root mean squared' averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements (ie vertical, longitudinal and transverse).

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V , expressed in mm/s can be converted to decibels by the formula $20 \log (V/V_0)$, where V_0 is the reference level (10^{-9} m/s). Care is required in this regard, as other reference levels may be used.

8. Human Perception of Vibration

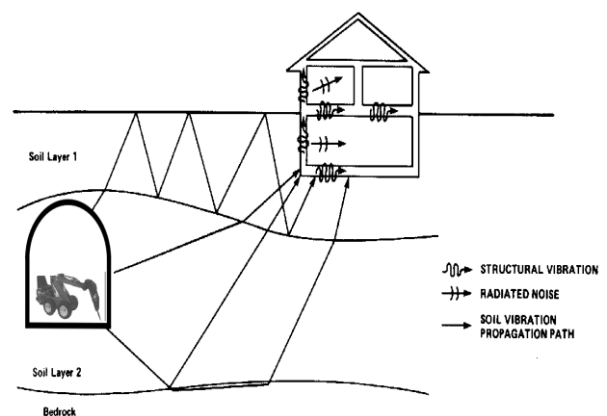
People are able to 'feel' vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as 'normal' in a car, bus or train is considerably higher than what is perceived as 'normal' in a shop, office or dwelling.

9. Ground-borne Noise, Structure-borne Noise and Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed 'structure-borne noise', 'ground-borne noise' or 'regenerated noise'. This noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

Typical sources of ground-borne or structure-borne noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

The following figure presents an example of the various paths by which vibration and ground-borne noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.



The term 'regenerated noise' is also used in other instances where energy is converted to noise away from the primary source. One example would be a fan blowing air through a discharge grill. The fan is the energy source and primary noise source. Additional noise may be created by the aerodynamic effect of the discharge grill in the airstream. This secondary noise is referred to as regenerated noise.

APPENDIX B

SLR Author CV

CURRICULUM VITAE



JOSHUA RIDGWAY

SENIOR PROJECT CONSULTANT

Acoustics & Vibration, Asia-Pacific

QUALIFICATIONS

MDesSc	2008	Master of Design Science (Audio and Acoustics), University of Sydney, NSW
DipPM	2018	Diploma of Project Management, Charter Australia Education and Training, NSW

EXPERTISE

- Transport (Rail, Road and Air) Noise and Vibration
- Construction Noise and Vibration
- Infrastructure and Industrial Noise and Vibration
- Noise and Vibration Measurement Systems

Joshua Ridgway completed his Master of Design Science (Audio and Acoustics) at University of Sydney in 2008, specialising in acoustic measurement, signal analysis and digital signal processing.

Joshua started his career in acoustics and vibration at SLR as a project consultant in the Acoustics and Vibration team in 2011, working on a broad range of projects involving field measurements, analysis, modelling, assessment and reporting.

Joshua's consulting experience has included measurement, analysis, modelling and control of noise and vibration from railways, roads, construction works, mining operations, infrastructure and industrial projects.

Joshua is experienced in the use of SoundPLAN predictive modelling software for a range of modelling applications including industrial noise, construction noise, road operational noise and rail operational noise.

PROJECTS

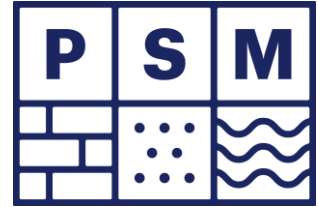
Transport Noise and Vibration Projects

M12 Motorway EIS, NSW	Ambient noise monitoring, construction noise and vibration assessment, lead modeller for operational noise impacts and assessment.
WestConnex M4-M5 Link EIS, NSW	Ambient noise monitoring, construction noise and vibration assessment, lead modeller for operational noise impacts and assessment.
M4 Smart Motorways EIS, M4 Widening EIS and WestConnex M4 East EIS, NSW	Ambient noise monitoring, operational noise assessment and modelling.
Northern Beaches Hospital Road Network Upgrade EIS, NSW	Ambient noise monitoring, operational noise assessment and modelling.
CBD and South East Light Rail EIS, NSW	Noise and vibration environmental impact assessment.
North West Rail Link EIS, NSW	Ambient noise monitoring, operational and construction noise assessments and modelling.

Northern Sydney Freight Corridor, NSW	Operational noise assessment and modelling.
Sydney Light Rail, NSW	Operational noise and vibration measurements and compliance assessment.
Parramatta Rail Turnback Project, NSW	Ambient noise monitoring, operational and construction noise assessment.
	Industrial/Construction Projects
Oakdale Central, South and West Industrial Developments, NSW	Project manager and lead modeller for noise impact assessments for State Significant Development applications for large multi-stage industrial developments from DA stage to occupation and compliance stage, and preparation of construction and operational noise and vibration management plans.
Enfield Intermodal Logistics Centre, NSW	Preparation of construction and operational noise and vibration management plans.
Metropolitan Colliery, NSW	Ambient noise monitoring, operational noise measurements, risk assessment and noise mitigation strategy.
M2 Upgrade Project, NSW	OOHs construction noise and vibration modelling and assessment.
	Built Environment Projects
Marsden Park North Precinct, NSW	Road traffic and ambient noise monitoring, assessment of noise impacts associated with the Precinct.
The Sheffield, Thornton, NSW	Acoustic assessment and advice for DA stage to CC stage mixed-use development.
Saint Mary Mackillop Catholic Church, Oran Park, NSW	Acoustic assessment and advice for CC to OC stage place of worship development.
Various Residential Developments, Epping, NSW	Acoustic assessment for DA stage residential developments.
MEMBERSHIPS	
Member	Australian Acoustical Society

APPENDIX C

PSM Consult Letter, dated 10 April 2019 – *WNSLR Bridge, Review and Recommendation for Allowable Vibration from Piling and Earthworks*



Our Ref: PSM1541-381L

10 April 2019

AT&L
Level 7, 153 Walker Street
NORTH SYDNEY NSW 2060

Attention: Alex Lohrisch
By email: alexl@atl.net.au

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North Ryde NSW 2113

P +61-2 9812 5000
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E mailbox@psm.com.au
www.psm.com.au

Dear Alex

RE: WNSLR BRIDGE, REVIEW AND RECOMMENDATION FOR ALLOWABLE VIBRATION FROM PILING AND EARTHWORKS

1. Introduction

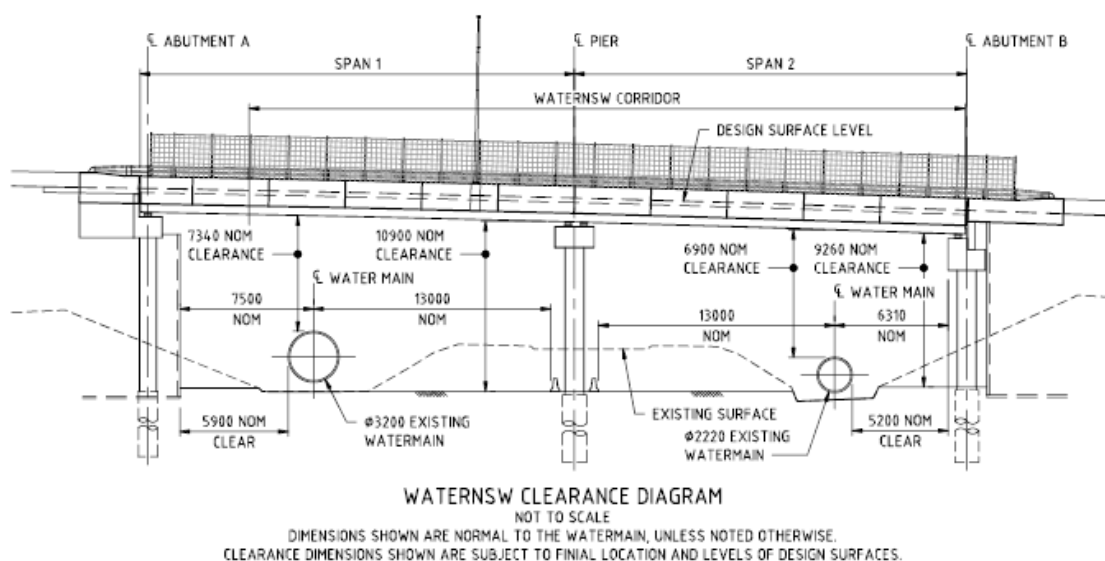
This letter provides advice on vibration for the proposed development of the bridge over the WaterNSW pipelines on the Western North-South Link Road (WNSIR).

We have been provided with the following documents:

- BG&E structural drawings “Bridge Over WaterNSW Pipelines” – Sheet 1 to 7 dated 17/12/2018.
- SLR “WNSLR Construction Noise and Vibration Management Plan” dated 8/11/2018.

We understand that as part of the proposed WNSLR development, a bridge will be constructed over the WaterNSW pipeline. The bridge will be supported on piles.

Insert 1 presents WaterNSW clearance diagram taken from BG&E drawing.



Inset 1: WaterNSW Clearance Diagram

Insert 2 presents selected site photos of the pipeline. The pipelines are above ground and are supported on saddles. We assume the pipe is welded.



Inset 2: WaterNSW pipeline

The horizontal distance between the proposed bridge piles and existing pipeline is at least 5.2 m.

The bored pile design requires the piles to be up to 17 m below surface. The pile excavation will be in soil units, eg. fill and residual soil (up to 3 m thick), very low to low strength shale (14 m thick) and founded on medium strength bedrock unit. The pile diameter will be between 1.2 m and 1.5 m.

2. Standards and Guidelines

We have reviewed the following documents regarding damage to structures due to vibration:

- BS 5228-2:2009 – Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration
- BS 7385-2:1993 – Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration
- DIN 4150-3:1999 – Structural Vibration - Part 3: Effects of vibration on structures
- AS 2187.2:2006 – Explosives - Storage and use - Part 2: Use of explosives
- Construction Noise and Vibration guideline – Road & Maritime Services

We note that experienced contractors should make their own assessment of the appropriate piling and earthworks equipment. The contractor should recognise that there is a potential for damage to the existing pipeline and consider this in planning and executing its work.

3. Vibration

3.1 Reference

The following sections provide a discussion of references we have considered when advising on appropriate vibration limits.

AS2187.2 - *Explosives - Storage and use Part 2 - Use of explosives* (2006) of contains vibration damage limits for structures, the limits are informative (rather than normative) and although it has been written for blasting, it is still considered applicable to other sources of vibrations.

Table J4.4.2.1 of the standard presents “*transient vibration guide values for the prevention of minor or cosmetic damage occurring in structures*”, for “*Unreinforced or light framed structure. Residential or light commercial type buildings*”. The suggested vibration limit applicable is 15 mm/s or 50 mm/s depending on the type of building. The term cosmetic damage is described in Table J4.4.2.2.

TABLE J4.4.2.1 of AS2187.2: 2001

TABLE J4.4.2.1 TRANSIENT VIBRATION GUIDE VALUES FOR COSMETIC DAMAGE (BS 7385-2)			
Line	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structure. 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
NOTES: 1 Values referred to are at the base of the building. 2 For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) should not be exceeded.			

TABLE J4.4.2.2 of AS2187.2: 2001

TABLE J4.4.2.2 BS 7385-1:1990—DAMAGE CLASSIFICATION	
Damage classification	Description
Cosmetic	The formation of hairline cracks on drywall surfaces or the growth of existing cracks in plaster or drywall surfaces; in addition, the formation of hairline cracks in the mortar joints of brick/concrete block construction
Minor	The formation of cracks or loosening and falling of plaster or drywall surfaces, or cracks through bricks/concrete blocks
Major	Damage to structural elements of the building, cracks in support columns, loosening of joints, splaying of masonry cracks etc.

We also note that Table 1 of the German Standard DIN 4150 *Structural Vibration Part 3, Effects of vibration on structures* (1999) suggests vibration limit for buildings based on the type of building.

TABLE 1 of DIN4150-3:1999

Table 1: Guideline values for vibration velocity to be used when evaluating the effects of short-term vibration on structures					
Line	Type of structure	Guideline values for velocity, v_i , in mm/s			
		Vibration at the foundation at a frequency of			Vibration at horizontal plane of highest floor at all frequencies
		1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz*)	
1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15
3	Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g. listed buildings under preservation order)	3	3 to 8	8 to 10	8
*) At frequencies above 100 Hz, the values given in this column may be used as minimum values.					

Section 5.3 of DIN 4150: Part 3 also sets out guideline values for vibration on buried pipework.

Table 2: Guideline values for vibration velocity to be used when evaluating the effects of short-term vibration on buried pipework

Line	Pipe material	Guideline values for velocity measured on the pipe, v_i , in mm/s
1	Steel (including welded pipes)	100
2	Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with or without flange)	80
3	Masonry, plastic	50

3.2 Vibration Limit

Section 5.2.1.1 "Sydney Catchment Authority Pipelines" of SLR *Construction and Management Plan* dated November 2018 states:

The WNSLR passes over the SCA pipelines. The pipelines are installed above ground and are supported on saddles.

The standards for vibration damage (Section 5.2.1 [BS 7385]) do not cater for structures similar to the pipelines construction. For the purpose of protecting the pipelines from vibration associated with the proposed works a vibration criterion of 30 mm/s PPV has been adopted. This value applies at the top of the pipelines between saddles to capture vibration amplification effects.

The proposed vibration threshold does not address settlement of the saddles and associated changes in static bending stresses of the pipelines.

We note details of the pipeline footings, including saddles are not known to PSM.

Based on our review on the references in Section 3.1, we recommend a maximum peak particle velocity (PPV) of 15 mm/s be adopted as a vibration limit at the pipeline for the construction of the bridge. We note the recommended limit is less than that proposed by SLR in their monitoring plan, and that provided in the DIN guideline for buried steel pipes; thus it is more stringent. We consider the limit is very conservative but appropriate in the circumstances.

We consider the vibration from the construction work can be relatively easily controlled to be less than the recommended vibration limit.

We understand the following activities are the potential sources of vibration during bridge construction:

- Earthworks. We assume this relates mainly to the piling rig platform construction.
- Piling works. This comprises drilling of the bored piles into medium strength bedrock at 17 m below the surface.

We refer to Table 2 of RMS Construction Noise and Vibration Guideline regarding the minimum work distance from intensive plant.

Table 2: Recommended minimum working distances from vibration intensive plant of Construction Noise and Vibration Guideline – Road & Maritime Services NSW

Plant item	Rating / Description	Minimum working distance	
		Cosmetic damage (BS 7385)	Human response (OH&E Vibration guideline)
Vibratory Roller	< 50 kN (Typically 1-2 tonnes)	5 m	15 m to 20 m
	< 100 kN (Typically 2-4 tonnes)	6 m	20 m
	< 200 kN (Typically 4-6 tonnes)	12 m	40 m
	< 300 kN (Typically 7-13 tonnes)	15 m	100 m
	> 300 kN (Typically 13-18 tonnes)	20 m	100 m
	> 300 kN (> 18 tonnes)	25 m	100 m
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	2 m	7 m
Medium Hydraulic Hammer	(900 kg – 12 to 18t excavator)	7 m	23 m
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator)	22 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m
Pile Boring	≤ 800 mm	2 m (nominal)	4 m
Jackhammer	Hand held	1 m (nominal)	2 m

With regards to the earthworks, we advise the following:

- Any fill should be placed and compacted using a static roller with no vibration.
- While excavation in bedrock is not expected during earthworks in the proposed bridge area, we consider that excavation in very low to low strength shale should be achievable using a conventional earthmoving equipment.

With regards to the piling works, based on our experience drilling bored piles in the inferred ground conditions within the bridge area is unlikely to trigger the recommended vibration limit, i.e. PPV of 15 mm/s.

4. Vibration Monitoring

Vibrations due to construction activities should be monitored by geophones with the measurement of peak particle velocity recorded by a data logger. Vibrations will be monitored continuously for the duration of earthworks and piling works.

Geophones shall be installed by an acoustic consultant on top of pipe between saddles to monitor the vibration due to the works. We suggest the geophones be located at permanent spots as such that they do not require to be relocated during the works.

Baseline readings should be undertaken for geophones. We recommend at least a week before any work starts. This is to allow monitoring of background vibration levels around the site. The acoustic consultant and the Contractor must provide results of the baseline vibration monitoring including details of the construction activities and monitoring locations to Goodman. Prior to work commencing, the monitoring locations and vibration baseline survey with respect to background vibration levels should be approved.

A vibration monitoring plan shall be prepared for the proposed work and shall include the following items as a minimum:

- Vibration trigger levels. We recommend a three-tier traffic-light system (levels) with a list of actions for each level to be adopted.
- Monitoring frequency. We recommend the data to be downloaded and reported every month.
- Reporting requirements. We recommend the report to be issued to Goodman for review at the following stages:
 - prior to the work (baseline report),
 - every month during construction,
 - any times that a trigger level is reached
 - upon completion of construction

If required, PSM can prepare a vibration monitoring plan for the proposed work.

5. Dilapidation Survey

With regards to dilapidation survey of the pipes, we suggest the dilapidation surveys be undertaken at least for the following stages:

- Prior to commencement of any work on site
- After completion of the work

As a minimum the survey for each stage shall involve:

- Collecting photos of the conditions of the site and existing pipeline and the foundations.
- Mapping / Identifying any existing issues or cracks, etc. prior to, during and after the work.

Should you have any queries regarding this letter, please do not hesitate to contact the undersigned.

For and on behalf of
PELLS SULLIVAN MEYNINK



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APPENDIX K

Construction Air Quality Management Plan

WESTERN NORTH SOUTH LINK ROAD

Construction Air Quality Management Plan SSD 7348

Prepared for:

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Goodman Property Services (Aust) Pty Ltd (the Client). 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 the Client. 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 SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

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610.17948-R03-v1.3	11 November 2019	Varun Marwaha	Kirsten Lawrence	Varun Marwaha
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1 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been commissioned by Goodman Property Services (Aust) Pty Ltd (Goodman) to prepare a Construction Air Quality Management Plan (CAQMP) for the construction of the Western North South Link Road (WNSLR) located in western Sydney area of Erskine Park, New South Wales (NSW).

The CAQMP is required under Condition D100 of Development Consent for State Significant Development 7348 (SSD 7348), granted in 2019 by the Department of Planning, Industry and Environment (DPIE) for the Oakdale West Estate (OWE) 'Concept Proposal' and 'Stage 1 Development'. The 'Stage 1 Development' includes construction of the WNSLR and associated subdivision. The WNSLR connects OWE to Lenore Drive to provide primary access to the OWE.

Whilst development consent has been granted for OWE 'Concept Proposal' and 'Stage 1 Development', this CAQMP is specifically for construction of the WNSLR only. The construction of OWE is covered in a separate CAQMP.

1.1 Development Overview

The WNSLR is an Interim Regional Road located on the eastern boundary of the OWE. OWE is a regional warehouse and distribution hub, located at Kemps Creek within the Penrith local government area (LGA) and forms part of the broader Oakdale Industrial Precinct located within the Western Sydney Employment Area (WSEA) (see **Figure 1**).

Goodman obtained Development Consent SSD 7348 on 13 September 2019 from the Department of Planning and Environment (DPE) for the Oakdale West 'Concept Proposal' and 'Stage 1 Development'. The Concept Proposal essentially comprises a 'Master Plan' to guide the staged development of Oakdale West and core development controls that will form the basis for design and assessment of future development applications for the site. It includes:

- Establishing primary site access, road layouts (including internal road network and connections to the external road network), developable and non-developable lands, biodiversity offsets, indicative development stages and development controls for the future development of the site;
- Stage 1 Development of the Estate including:
 - Estate Works, including site preparation, bulk earthworks and retaining walls, catchment level stormwater infrastructure, trunk services connections and utility infrastructure, roads and access infrastructure associated with Stage 1 and subdivision in Stage 1 development works;
 - Precinct Development, including construction, fit out and use of warehouse buildings within Precinct 1, detailed earthworks, on lot stormwater, services and utility infrastructure and construction of industrial/warehouse buildings;
 - Construction of a new regional road known as the Western North South Link Road (WNSLR) connecting to Lenore Drive to provide the primary access to the site; and
 - Western boundary landscaping.

The WNSLR is intended to provide a connection between Lenore Drive and the future Southern Link Road currently under investigation by the DPE.

In the short term the WNSLR will be a public road managed by Penrith City Council (Council), providing local access for OWE and other industrial areas north of the Water New South Wales (WaterNSW) pipeline located on the northern boundary of Oakdale West (see **Figure 2**). Construction of the WNSLR is to be undertaken by Robson Civil Projects (Robson). AT&L Associates (AT&L) will act as the Project Manager and Contract Superintendent overseeing both the construction of the WNSLR and OWE.

Note: Where Goodman is nominated as having responsibility as the Applicant, this may be delegated to their specialist consultants.

For the purposes of this document, the development is described in *Environmental Impact Statement, Oakdale West Estate - State Significant Development Application* (EIS) prepared by Urbis (2017), including all specialist assessments and other appendices.

Figure 1 Regional Location of the Western North South Link Road

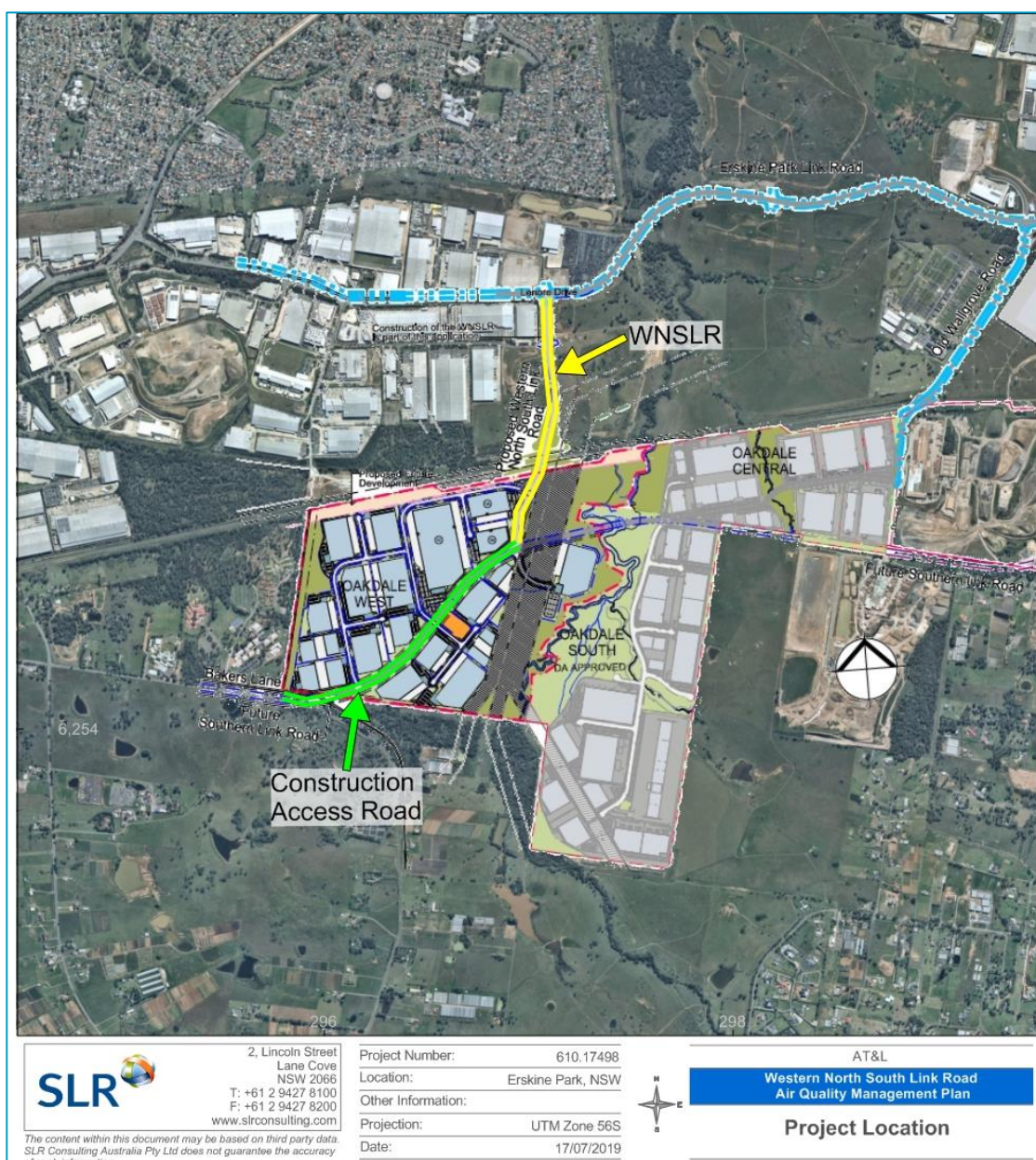
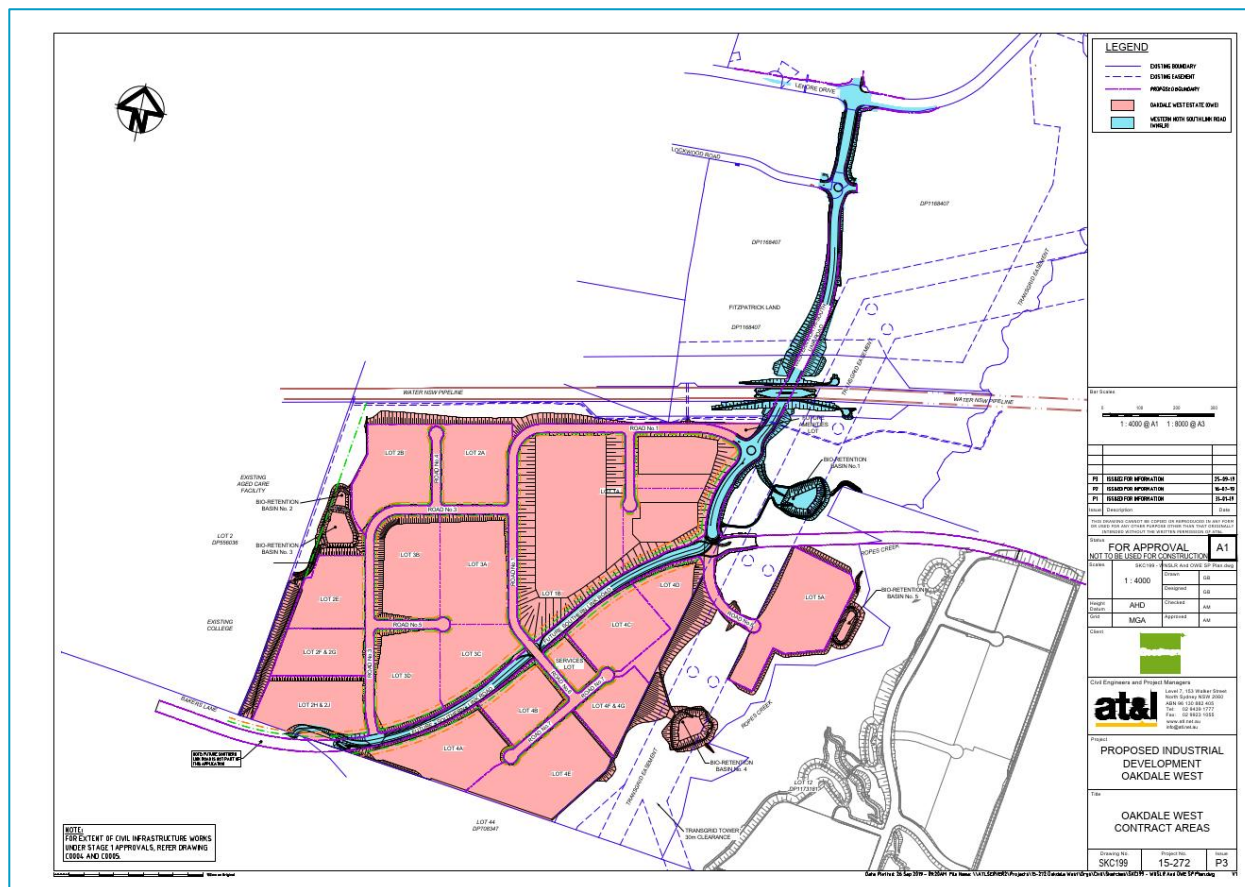


Figure 2 WNSLR Layout



1.2 Objectives of the CAQMP

The objectives of the CAQMP are as follows:

- Maintain acceptable levels of amenity for surrounding residents;
- Ensure compliance with relevant ambient air quality criteria for particulate matter at surrounding receptor locations;
- Maintain an effective response mechanism to deal with issues and complaints relating to dust emissions from the construction works;
- Outline roles and responsibilities in relation to the management of dust emissions during construction; and
- Promote environmental awareness among employees and subcontractors.

2 Statutory Requirements

2.1 Development Consent

The Development Consent (SSD 7348) requirements stipulated for the construction of the WNSLR and where they have been addressed in this CAQMP are shown in **Table 1**.

Table 1 Assessment against Development Consent Conditions

Conditions	Response/Section Reference
Condition D98 of SSD 7348	
The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent	Section 8
Condition D99 of SSD 7348	
During construction of Stage 1, the Applicant must ensure that: <ul style="list-style-type: none"> (a) exposed surfaces and stockpiles are suppressed by regular watering; (b) all trucks entering or leaving the Site with loads have their loads covered; (c) trucks associated with Stage 1 do not track dirt onto the public road network; (d) public roads used by these trucks are kept clean; and (e) land stabilisation works are carried out progressively on site to minimise exposed surfaces. 	Section 8
Condition D100 of SSD 7348	
(a) be prepared by a suitably qualified and experienced person(s)	2-page CV of the author is attached in Appendix B
(b) detail and rank all emissions from all construction activities, including particulate emissions	Section 4
(c) describe a program that is capable of evaluating the performance of the construction and determining compliance with key performance indicators	Section 10
(d) identify the control measures that will be implemented for each emission source	Section 8
(e) nominate the following for each of the proposed controls: <ul style="list-style-type: none"> - key performance indicator - monitoring method - location, frequency and duration of monitoring - record keeping - complaints register - response procedures - compliance monitoring 	Section 8 (Table 9)
Condition D118 of SSD 7348	
(a) details of: <ul style="list-style-type: none"> (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; 	Section 5.2

Conditions	Response/Section Reference
(b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 8
(c) a program to monitor and report on the: (i) impacts and environmental performance of Stage 1; and (ii) effectiveness of the management measures set out pursuant to paragraph (b) above;	Section 10
(d) 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;	Section 11
(e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time;	Section 10
(f) a protocol for managing and reporting any: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); (ii) complaint; (iii) failure to comply with statutory requirements; and	Section 9 & Section 10 See overarching CEMP
(g) a protocol for periodic review of the plan.	Section 13

2.2 Roads and Maritime Environmental Protection Specification

Additional requirements for the Project are detailed in Roads and Maritime Services (Roads and Maritime) Environmental Protection Specification (G36), dated November 2018. The requirements relevant to this CAQMP are reproduced in **Table 2**.

Table 2 QA Specification G36 Conditions

Conditions	Response/Section Reference
Condition 4.4.1 of G36 (General)	
(a) potential sources of air pollution (such as dust, vehicles transporting waste, plant and equipment) during construction	Section 4
(b) identification of potential risks/impacts due to the work/activities as dust generation activities;	Section 4
(c) a procedure for monitoring of air quality to: - Verify the effectiveness of controls and enable early intervention, such as, but not limited to, visual monitoring - To assess compliance with the identified objectives, and developed in accordance with any relevant published EPA and/or OEH guidelines.	Section 10
(d) mitigation and management measures to be implemented to minimise risk, including measures during weather conditions where high dust episodes are likely (such as strong winds in dry weather).	Section 8
(e) A process for monitoring dust on site and weather conditions	Section 10

Conditions	Response/Section Reference
(f) contingency plans to be implemented in the event of non-compliances and/or complaints about dust	Section 11
(g) procedures for regularly reviewing the effectiveness of the Air Quality Management Sub-Plan and revising where required	Section 13
(h) Restrict dust generation to below 4 gm/m ² /month during construction and not more than 2 gm/m ² /month increase in dust deposition against base levels. Detail in your CEMP how monitoring of conformance with these criteria will be undertaken and validated	Section 10
Condition 4.4.2 of G36 (Air Emissions Performance Requirements of Mobile Non-road Diesel Plant and Equipment)	
<p>Report on the conformity, or otherwise, of mobile non-road diesel plant and equipment used for the Work Under the Contract with the relevant United States Environmental Protection Agency, European Union (EU) standards or approved equivalent emission standards.</p> <p>Once a year, submit to the Principal such reports at the following dates:</p> <p>(a) before 31 July, for the reporting period ending 30 June for the previous 12 months;</p> <p>(b) at Actual Completion Date, for the final reporting period.</p> <p>Prepare the report in accordance with the GREP "Clean Air data management tool".</p> <p>The types of diesel plant and equipment that are to be included, or excluded, from the report are given in this document, which is available at:</p> <p>http://www.rms.nsw.gov.au/documents/about/environment/grep-clean-air-data-management-tool.xlsm.</p>	Section 8

3 Project Overview

3.1 Description

The WNSLR is approximately 1.3 km in length and 30 m wide, and provides a link between OWE, Lenore Drive to the north and the future Southern Link Road to the south. The corridor will be bound by Fitzpatrick land on both sides of the corridor for the northern portion, WaterNSW land on both sides of the corridor for the middle portion, Goodman land to the west and the existing Transgrid easement to the east for the southern portion. A WaterNSW pipeline intersects the proposed WNSLR alignment; therefore a bridge is to be constructed over the pipeline. A Construction Access Road will also be constructed by Robson which connects Bakers Lane to the WNSLR.

3.2 Location

Located in the Penrith local government area (LGA) at the far south western extent of the WSEA, the WNSLR is made up of the following five land parcels legally described as:

- Lot 3031, DP 1168407 (owned by Fitzpatrick Investments);
- Lot 6, DP 229784 (owned by WaterNSW);
- Lot 2, DP 84578 (owned by WaterNSW);
- Lot 3, DP 85393 (owned by WaterNSW); and
- Lot 11, DP1178389 (owned by Goodman).

3.3 Surrounding Land Uses

Within the area surrounding the WNSLR, the predominant land uses include industrial warehouses and factories, several of which have been identified as having the potential to be considered sources of air emissions. The nearest residential receptors to the WNSLR is located approximately 500 m north on Weaver Street, Erskine Park.

3.4 Construction Staging and Activities

Stage 1 Development includes the site preparation and infrastructure works required to facilitate development of the estate in line with the Concept Proposal. This includes the construction of the WNSLR and connection to the estate road network along with the development of Precinct 1 for warehousing and distribution. The construction of the WNSLR is estimated to take approximately 50 weeks, subject to any weather delays.

Work associated with the WNSLR includes the construction of the following intersections:

- A 4-leg signalised intersection with Lenore Drive, providing access to the regional road network and a local connection;
- A 4-leg roundabout intersection with Lockwood Road (previously a cul-de-sac), providing a local connection between the WNSLR and Templar Road as well as providing a connection for a local road supporting development to the east, comprising the balance of Fitzpatrick lands;
- A 3-leg roundabout to a T-junction to Estate Road 1, providing primary access to Oakdale West and will be the sole access provided to Precincts 1 - 4 until the completion of the Southern Link Road; and

- A full road construction with temporary line marking between Estate Road 1 and the future Southern Link Road to provide connection in advance of the Southern Link Road.

The WNSLR also includes the construction of the Construction Access Road along the future Southern Link Road alignment through Oakdale West. The WNSLR also includes the construction of Bio-retention Basin 1.

Construction is scheduled to commence in late October 2019 (earlier if possible, subject to all post-approval requirements). Robson estimate the construction program to take approximately 50 weeks, subject to any delays during construction (i.e. wet weather or authority delays) which may increase the duration of the works.

Construction of the Construction Access Road (see **Figure 3**) will be undertaken first and will take approximately 12-16 weeks. All other work zones will be constructed concurrently until completion of the project.

As part of the bridge construction, earthworks are required on either side of both WaterNSW pipelines. This work includes lowering the existing access track between the pipes to provide the necessary clearance under the bridge, as well reshaping the existing outside batters to provide access to the bridge abutments for maintenance.

Legend:

- WNSLR (North)
- Bridge Crossing & WaterNSW Access Track
- WNSLR (South)
- Construction Access Road

Map labels include: LOT 7, LOT 8, LOT 9, LOT 10, LOT 11, LOT 12, LOT 13, LOT 14, LOT 15, LOT 16, LOT 17, LOT 18, LOT 19, LOT 20, LOT 21, LOT 22, LOT 23, LOT 24, LOT 25, LOT 26, LOT 27, LOT 28, LOT 29, LOT 30, LOT 31, LOT 32, LOT 33, LOT 34, LOT 35, LOT 36, LOT 37, LOT 38, LOT 39, LOT 40, LOT 41, LOT 42, LOT 43, LOT 44, LOT 45, LOT 46, LOT 47, LOT 48, LOT 49, LOT 50, LOT 51, LOT 52, LOT 53, LOT 54, LOT 55, LOT 56, LOT 57, LOT 58, LOT 59, LOT 60, LOT 61, LOT 62, LOT 63, LOT 64, LOT 65, LOT 66, LOT 67, LOT 68, LOT 69, LOT 70, LOT 71, LOT 72, LOT 73, LOT 74, LOT 75, LOT 76, LOT 77, LOT 78, LOT 79, LOT 80, LOT 81, LOT 82, LOT 83, LOT 84, LOT 85, LOT 86, LOT 87, LOT 88, LOT 89, LOT 90, LOT 91, LOT 92, LOT 93, LOT 94, LOT 95, LOT 96, LOT 97, LOT 98, LOT 99, LOT 100.

3.5 Construction Hours

Construction hours for the WNSLR will be in accordance with Condition D70 and D71 of Development Consent SSD 7348, which are reproduced below:

D70. *The Applicant must comply with the hours detailed in Table 5, unless otherwise agreed in writing by the Planning Secretary.*

Table 5: Hours of Work

Activity	Day	Time
Construction	Monday – Friday	7 am to 6 pm
	Saturday	8 am to 1 pm
Operation	Monday – Sunday (including public holidays)	24 hours

D71. *Works outside of the hours identified in Condition D62 may be undertaken in the following circumstances:*

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

Additionally, Section 3.6 of the G36 specification lists the same construction hours set out in SSD 7348. G36 states that work outside of normal working hours is permitted without prior approval in the following circumstances:

- Delivery of materials outside of normal working hours, where delivery at such times is required by the Police or other authorities for reasons of safety or otherwise; or
- Work during an emergency, where such work is necessary to avoid the loss of lives, property and/or prevent environmental harm.

3.6 Construction Site Access

The construction of the WNSLR will occur in accordance with **Section 3.4**. In accordance with the Construction Traffic Management Plan (CTMP) (Ason 2019), details the site access arrangements for the applicable work zones shown in **Figure 3**.

Table 3 Site Access

Work Zones	Access Arrangement
Construction Access Road	Via Bakers Lane.
WNSLR (North)	Primary access via Lockwood Road to facilitate all movement access to Lenore Drive. Left-in, left-out access to Lenore Drive.
Bridge Crossing	<ul style="list-style-type: none">Northern section – to/from Lenore Drive via Lockwood Road.Central section – entry from Mamre Road, under an approved Traffic Control Plan (to be submitted by Robson).Southern section – to/from Mamre Road via Bakers Lane.
WNSLR (South)	In the short term, access will be to/from Mamre Road via Bakers Lane. Upon completion of the Bridge Crossing works, additional access shall be to Lenore Drive via the WNSLR.

4 Potential Sources of Air Emissions

During the construction works, fugitive dust emissions are considered to be the primary emission type, which could give rise to nuisance and/or health impacts for the surrounding sensitive areas. The key potential sources of dust associated with construction of the WNSLR have been identified as:

- Dust emissions from earthworks activities (eg excavation and loading of soils to trucks);
- Wind-generated dust from disturbed surfaces and stockpiles;
- Wheel-generated dust and particulate matter emissions in diesel exhaust emissions from on-site plant and equipment and construction traffic movements; and
- Particulate matter associated with exhaust emissions from increased/congested traffic emissions due to road closures or diversions.

In addition to the construction activities being carried out at any point in time, a number of other environmental factors may also affect the generation and dispersion of dust emissions, including:

- Wind direction - determines whether dust and suspended particles are transported in the direction of the sensitive receptors;
- Wind speed - governs the potential suspension and drift resistance of particles;
- Surface type - more erodible surface material types have an increased soil or dust erosion potential;
- Surface material moisture - increased surface material moisture reduces soil or dust erosion potential; and
- Rainfall or dew - rainfall or heavy dew that wets the surface of the soil reduces the risk of dust generation.

The Environmental Impact Statement (EIS) for the construction and operation of OWE was prepared by URBIS in November 2017 (URBIS 2017). Appendix U (Air Quality Impact Assessment) of the EIS states that the main emissions to air during the construction phase will be emissions of particulate matter (as TSP, PM₁₀ and PM_{2.5}) and nuisance dust from the movement of vehicles and construction equipment, excavation and rehabilitation, demolition, clearing and grading, truck loading and unloading and wind erosion.

The construction activities are broadly divided into four categories, ie demolition, earthworks, construction (building) and trackout. Potential air quality impacts associated with the construction of the WNSLR and the relative risk ratings are addressed in **Section 7**.

5 Relevant Pollutants and Air Quality Criteria

5.1 Pollutants of Concern

As identified in **Section 4**, potential air pollutants of interest for the construction of the WNSLR are considered to be dust, both:

- Suspended particulate matter; and
- Deposited dust.

The following sections outline the potential health and amenity issues associated with the above pollutants, while **Section 5.2** outlines relevant air quality assessment criteria.

5.1.1 Suspended Particulate Matter

Airborne contaminants that can be inhaled directly into the lungs can be classified on the basis of their physical properties as gases, vapours or particulate matter. In common usage, the terms “dust” and “particulates” are often used interchangeably. The health effects of particulate matter are strongly influenced by the size of the airborne particles. Smaller particles can penetrate further into the respiratory tract, with the smallest particles having a greater impact on human health as they penetrate to the gas exchange areas of the lungs. Larger particles primarily cause nuisance associated with coarse particles settling on surfaces.

The term “total suspended particulate matter” (TSP) refers to a category of airborne particles, typically less than 30 microns (μm) in diameter. Particulate matter with an aerodynamic diameter of 10 microns or less is referred to as PM_{10} . The PM_{10} size fraction is sufficiently small to penetrate the large airways of the lungs, while $\text{PM}_{2.5}$ (2.5 microns or less) particulates are generally small enough to be drawn in and deposited into the deepest portions of the lungs. Potential adverse health impacts associated with exposure to PM_{10} and $\text{PM}_{2.5}$ include increased mortality from cardiovascular and respiratory diseases, chronic obstructive pulmonary disease and heart disease, and reduced lung capacity in asthmatic children. In an urban setting, the emission of $\text{PM}_{2.5}$ is primarily associated with vehicles exhausts resulting from the incomplete combustion of diesel.

5.1.2 Deposited Dust

Section 5.1.1 is concerned in large part with the health impacts of particulate matter. Nuisance impacts need also to be considered, mainly in relation to deposited dust. Dust can cause nuisance by settling on surfaces and possessions, affecting visibility and contaminating tank water supplies. High rates of dust deposition can also adversely affect vegetation by blanketing leaf surfaces.

5.2 Ambient Air Quality Criteria

There are no air quality criteria outlined within the Development Consent SSD 7348, therefore the NSW EPA criteria have been adopted in **Table 4** and **Table 5**.

5.2.1 Suspended Particulate Matter

State air quality guidelines specified by the NSW Environmental Protection Agency (EPA) for the pollutants identified in **Section 5.1** are published in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA 2017a) (hereafter 'Approved Methods'). The ground level air quality impact assessment criteria listed in Section 7 of the Approved Methods have been established by NSW EPA to achieve appropriate environmental outcomes and to minimise associated risks to human health as published in the Approved Methods. They have been derived from a range of sources and are the defining ambient air quality criteria for NSW, and are considered to be appropriate for use in this assessment.

A summary of the relevant impact assessment criteria for suspended particulate matter is provided in **Table 4**.

Table 4 NSW EPA Criterion for Particulate Matter

Pollutant	Averaging Period	Concentration
PM ₁₀	24 Hours	50 µg/m ³
	Annual	25 µg/m ³
TSP	Annual	90 µg/m ³

Source: EPA 2017a

5.2.2 Deposited Dust

The relevant criterion for nuisance dust deposition is provided in **Table 5**. The rate of dust deposition is measured by means of a collection gauge, which catches the dust settling over a fixed surface area and over a period of about 30 days.

Table 5 NSW EPA Criterion of Nuisance Dust Deposition

Pollutant	Averaging Period	Assessment Criteria (g/m ² /month)
Deposited dust	Annual	2 (maximum increase in deposited dust level) 4 (maximum total deposited dust level)

5.3 Local Government Air Quality Toolkit

The NSW EPA has developed the Local Government Air Quality Toolkit (EPA 2018), in response to requests from local Council officers for information and guidance on the common air quality issues they manage. Guidance is available under Part 3 of the Local Government Air Quality Toolkit for Construction Sites.

This document lists the common sources of emissions and mitigation and management measures to control airborne dust levels from construction sites and has been consulted in the development of this CAQMP.

6 Existing Environment

6.1 Local Meteorology

The Bureau of Meteorology (BoM) maintains and publishes data from weather stations across Australia. The closest such station recording wind speed and wind direction data is the Horsley Park Automatic Weather Station (AWS) (Station ID 67119), located approximately 5.5 kilometres (km) southeast of the WNSLR. The long term and short term seasonal wind roses and long term rainfall patterns observed at the Horsley Park AWS indicate that:

- Winds that would blow fugitive dust emissions from the demolition/construction works towards the nearest sensitive receptors located to the north and northwest of the proposed construction activities occur rarely during autumn and winter, and are more likely to occur during summer and spring.
- The long term wind and rainfall patterns suggest that the construction at the Development Site have the greatest potential to impact on surrounding sensitive receptors during the months of May (autumn), and July (winter) to October (spring).

Full analysis of the wind roses and rainfall can be found in **Appendix A**.

6.2 Background Air Quality

The NSW OEH maintains a network of Air Quality Monitoring Stations (AQMSs) across NSW. The nearest such station is located at St Marys, approximately 4.5 km northwest of the WNSLR. The St Marys AQMS was commissioned in 1992 and is located on a residential property off Mamre Road, St Marys. It is situated in the centre of the Hawkesbury Basin and is at an elevation of 29 m.

There were no exceedances of the 24 hour average PM₁₀ criterion in 2014 and 2017, one exceedance in 2015 and three exceedances in 2016 and two exceedances in 2018. A summary of the PM₁₀ concentrations for the last five years (2014-2018) is tabulated in **Table 6** and presented graphically in **Figure 4**. No TSP monitoring data are available.

Table 6 Summary of PM₁₀ Monitoring Data at St Marys AQMS (2014 – 2018)

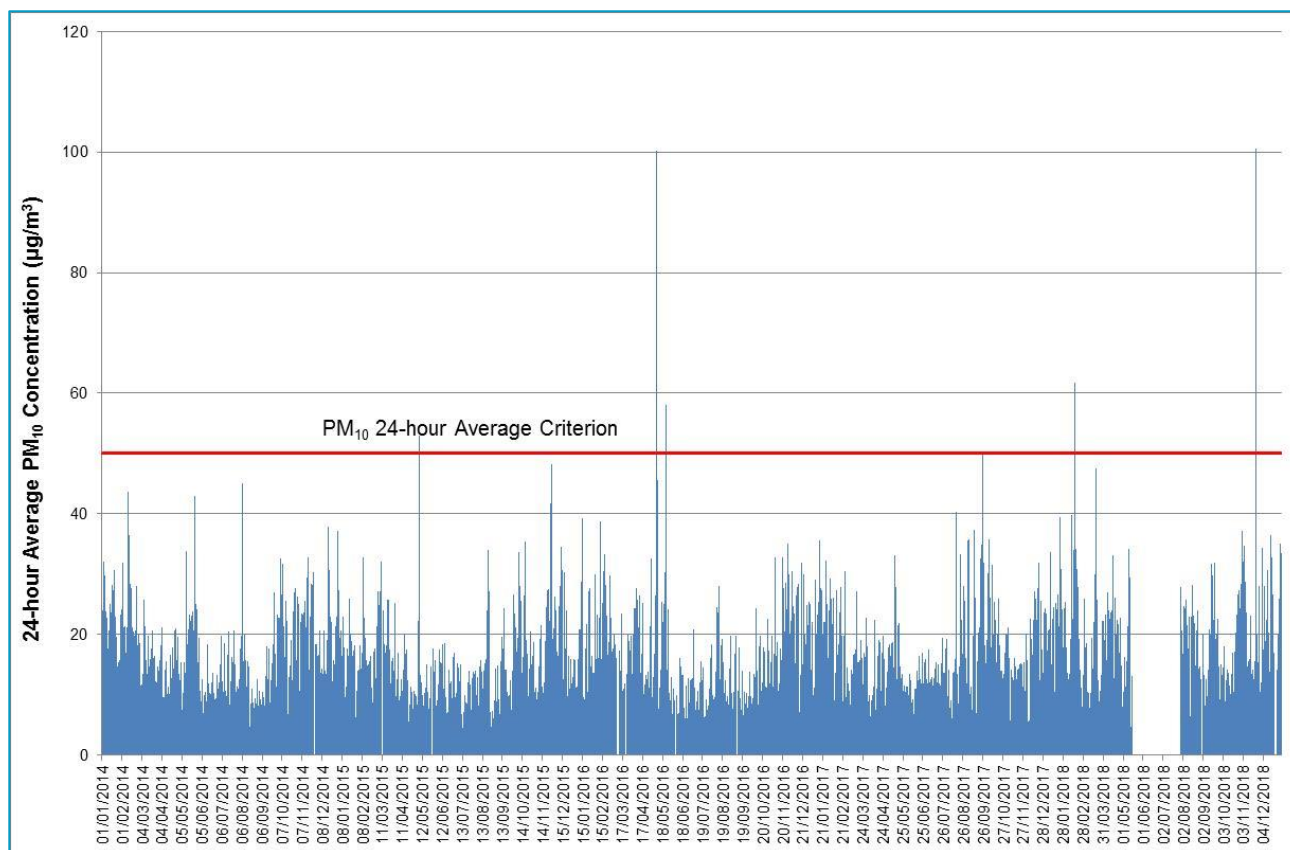
Averaging Period	Maximum 24-hour Average	Annual
	µg/m ³	µg/m ³
2014	45.0	16.7
2015	53.0 ^a	15.0
2016	100.2 ^b	16.1
2017	49.8	16.2
2018	100.5 ^c	19.4
Criterion	50	25

^a Recorded on 6 May 2015

^b Recorded on 8 May 2016

^c Recorded on 22 November 2018

Figure 4 Measured 24-Hour Average PM₁₀ Concentrations at St Marys AQMS (2014 – 2018)



A review of the exceedances recorded during 2015 (OEH 2017a), 2016 (OEH 2018a), 2017 (OEH 2018b) and 2018 (OEH 2019) indicates that they were associated with natural events such as bushfires or dust storms, or hazard reduction burns.

It has been noted the NSW EPA in their publication – NSW Annual Air Quality Statement 2018 (OEH 2019) state that air quality is generally good in New South Wales based on information from the 43 station NSW Air Quality Monitoring Network. For 2018, the air quality was generally ‘good’, and air quality standards were met for 98% of the days in Sydney. During this time, exceedances of the national air quality standards for particle pollution have usually been associated with regional dust storms and vegetation fires.

PM₁₀ concentrations vary across years with higher levels and more exceedances occurring in bushfire and dust storm affected years. Dry El Niño years (2002–2007) have been associated with a greater frequency of bushfires and dust storms and therefore higher particle pollution levels. Lower particle pollution levels have occurred during wetter La Niña years (2010–2012).

7 Assessment of Dust Emissions During Construction

The key potential health and amenity issues associated with construction of the WNSLR are, respectively:

- Elevated suspended particulate concentrations (PM₁₀); and
- Nuisance due to dust deposition (soiling of surfaces) and visible dust plumes.

7.1 Construction Impact Assessment Methodology

Quantitatively assessing impacts of fugitive dust emissions from construction projects using predictive modelling is seldom considered appropriate, primarily due to the uncertainty in the details of the construction activities, including equipment type, number, location and scheduling, which are unlikely to be available at the time of the assessment. Furthermore, they are also likely to change as construction progresses. In comparison, the equipment and operations of a mine or quarry are determined during the planning stages and more likely to remain consistent for long periods (several months or years).

Instead, it is considered appropriate to conduct a qualitative assessment. Potential impacts of dust emissions associated with proposed demolition and construction activities at the Development Site has been performed based on the methodology outlined in the Institute of Air Quality Management (UK) (IAQM) document, *“Assessment of dust from demolition and construction”* (Holman et al 2014). This guidance document provides a structured approach for classifying construction sites according to the risk of air quality impacts, to identify relevant mitigation measures appropriate to the risk (see **Appendix C** for full methodology).

The IAQM approach has been used widely in Australia for the assessment of air quality impacts from construction projects and the identification of appropriate mitigation measures, and has been accepted by regulators across all states and territories for a variety of construction projects.

The IAQM method uses a four-step process for assessing dust impacts from construction activities:

- **Step 1:** Screening based on distance to the nearest sensitive receptor; whereby the sensitivity to dust deposition and human health impacts of the identified sensitive receptors is determined.
- **Step 2:** Assess risk of dust effects from activities based on:
 - the scale and nature of the works, which determines the potential dust emission magnitude; and
 - the sensitivity of the area surrounding dust-generating activities.
- **Step 3:** Determine site-specific mitigation for remaining activities with greater than negligible effects.
- **Step 4:** Assess significance of remaining activities after management measures have been considered.

7.2 Risk Assessment

Table 7 presents the preliminary risk of air quality impacts from uncontrolled construction activities determined using the risk matrix provided in (**Table C4** in **Appendix C**), based on the identified receptor sensitivity and sensitivity of the area.

Table 7 Preliminary Risk of Air Quality Impacts from Construction Activities (Uncontrolled)

Impact	Sensitivity of Area	Dust Emission Magnitude				Preliminary Risk			
		Demolition	Earthworks	Construction	Trackout	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Small	Large	Medium	Medium	Negligible	Low Risk	Low Risk	Low Risk
Human Health	Low					Negligible	Low Risk	Low Risk	Low Risk

The results indicate that there is a low risk of adverse dust soiling and a low risk of human health impacts occurring at the off-site sensitive receptor locations if no mitigation measures were to be applied to control emissions during the works.

Based on the dust emission magnitudes and the preliminary risk from these activities, the activities are ranked as (highest risk to lowest risk):

1. Earthworks
2. Construction
3. Trackout
4. Demolition

For almost all construction activity, the IAQM Methods notes that the aim should be to prevent significant effects on receptors through the use of effective mitigation and experience shows that this is normally possible.

8 Mitigation Measures

The potential for dust emissions during construction works at the WNSLR and the potential impact on surrounding sensitive receptors are anticipated to be largely controllable through a range of mitigation measures, including good site management, good housekeeping measures, appropriate vehicle maintenance and applying appropriate dust mitigation measures where required.

The general dust mitigation measures to be implemented during construction of the WNSLR are detailed in **Table 8**. The dust mitigation measures specific to the key emission activities (ie earthworks, construction, trackout and demolition) are also provided in **Table 8**.

Table 8 Dust Mitigation Measures

#	Mitigation Measure
1	Communications
1.1	Develop and implement a stakeholder communications plan that includes community engagement (via Goodman) before work commences on site.
1.2	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the Site Superintendent.
1.3	Display the head or regional office contact information.
2	Site Management
2.1	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken (as per Section 3.6 of the overarching CEMP).
2.2	Summary of complaints in Environmental Representative Monthly Report to the DPE.
2.3	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite (eg any dust clouds can be seen leaving site and smoky exhausts on vehicles and equipment) and the action taken to resolve the situation in the Incident Register.
2.4	Where excessive dust events occur (ie prolonged visual dust in a particular area) watering of dusty activities is to be undertaken or activities temporarily halted and then resumed once weather conditions have improved. Review Horsley Park Bureau of Meteorology station daily weather forecast (ie wind, rain) to inform site dust management procedures for the day.
3	Preparing and Maintaining the Site
3.1	Minimise dust generating activities in areas close to receptors.
3.2	Stockpiles that will be in place for more than 20 days as well as any stockpiles that are susceptible to wind or water erosion will be covered or otherwise protected from erosion within 10 days of forming each stockpile. Temporary stabilisation of disturbed surfaces will be undertaken within two weeks.
3.3	Exposed surfaces and stockpile are suppressed by regular watering (Condition D91a).
3.4	Keep site fencing, barriers and scaffolding clean using wet methods.
3.5	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
3.6	Land stabilisation works are carried out progressively on site to minimise exposed surfaces (Condition D91e).
4	Operating Vehicle/Machinery and Sustainable Travel
4.1	Ensure all on-road vehicles comply with relevant vehicle emission standards, where applicable, and must be maintained in good condition and in accordance with manufacturer's specifications and that exhaust emissions comply with the Protection of the Environment Operations Act 1997 (Condition 4.4.2 of G36).

#	Mitigation Measure
4.2	Stationary trucks will switch off engines if idling time on-site is likely to exceed 5 minutes.
4.3	Vehicle speed limit restrictions are implemented on site, including: <ul style="list-style-type: none"> • General - 20km/h • High risk area - 10km/h • Haul routes - 50km/h
4.4	Minimise truck queuing and unnecessary trips through logistical planning.
4.5	Trucks associated with Stage 1 do not track dirt onto the public road network (Condition D91c).
4.6	Public roads used by these trucks are kept clean (Condition D91d).
5	Operations
5.1	Only use cutting, grinding or sawing equipment fitted with suitable dust suppression systems, such as water sprays.
5.2	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water.
5.3	Use of watercart to reduce dust emissions on unsealed roads.
5.4	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
5.5	Works (including spraying of paint and other materials) will not be carried out during strong winds or in weather conditions where high levels of air borne particulates are likely. Continual monitoring of wind speed and direction will be undertaken to guide this decision.
6	Waste Management
6.1	No on-site burning of waste materials, timbers or any other combustible materials.
6.2	All trucks entering or leaving the Site with loads have their loads covered (Condition D91b).
7	Earthworks
7.1	Only the minimum area necessary is disturbed at any one time.
7.2	Rehabilitation of disturbed areas will be undertaken progressively and as soon as practicable, and rehabilitation of disturbed surfaces within 20 days of final construction levels.
7.3	If unanticipated strong odours are encountered or significant dust emissions are noted on site, related works will be stopped and the Contractor's Project Manager will be contacted.
7.4	Carry out excavation works and vehicle loading/unloading when weather conditions are favourable (i.e. receptors are upwind from the works).
8	Construction
8.1	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
9	Trackout
9.1	Use water-assisted dust sweeper(s) on the access and local roads to remove, as necessary, any material tracked out of the site.
9.2	Avoid dry sweeping of large areas.
9.3	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
9.4	Record all inspections of haul routes and any subsequent action in a site log book.
9.5	Implement a wheel washing system and/or cattle grid system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site).

#	Mitigation Measure
10	Demolition
10.1	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed.
10.2	Bag and remove any biological debris or damp down such material before demolition.

As required by condition D100 (e), **Table 9**, summarises the parameters identified to assess the effectiveness of the control measures shown in **Table 8**.

Table 9 Summary of the Parameters to Assess the Effectiveness of Control Measures

Parameter	Visible Dust	Dust Deposition	Complaints	PM ₁₀
Key performance indicator	No visible dust leaving the site boundary	<4 g/m ² /month	No complaints related to nuisance dust	<50 µg/m ³ as a 24-hour average
Monitoring method	Visual inspection	Dust deposition gauges	-	See note
Location, frequency and duration of monitoring	Daily onsite inspection	Section 10	-	See note
Record keeping	Section 9	Section 11	Section 9	See note
Response procedures	Section 11	Section 11	Section 9	See note
Compliance monitoring	-	Section 10	-	See note

Note: Real-time suspended particulate monitors are installed at the site to assist with dust management (see **Section 10**). The monitoring system used however, does not meet the requirements of a compliance instrument. Should compliance-level monitoring be required as per **Table 10**, then this table will be updated to reflect the expanded monitoring programme.

9 Complaints Handling and Response Procedure

All complaints will be handled in accordance with the sections below and the WNSLR *Community Communication Strategy* (CCS) (SLR 2019b).

9.1.1 Performance Objective

To ensure that all environmental complaints in relation to the air emissions from construction of the WNSLR are promptly and effectively received, handled and addressed.

9.1.2 Responsibility

The Communications and Community Liaison Representative is responsible for ensuring that the appropriate management response and handling procedures are instigated and carried through in the event of an environmental complaint. The induction and toolbox talks outlined in the CEMP will be used to ensure all site employees are aware of and understand their obligations for complaints response.

All employees who take receipt of a complaint, either verbal or written, are to immediately notify the Contractor's Project Manager, who will then contact the Communications and Community Liaison Representative.

9.1.3 Complaints Handling Procedure

Upon becoming aware of a complaint, the protocol outlined below will be followed.

1. Record and Acknowledge

Any employee who take receipt of a complaint, either verbal or written, is to immediately notify the Contractor's Project Manager who will then contact the Communications and Community Liaison Representative. The Contractor's Project Manager will be available 24 hours a day, seven days a week and have the authority to stop or direct works.

In the normal course of events, the first contact for complaints will usually be made in person or by telephone.

The complainant's name, address and contact details, along with the nature of the complaint, must be requested. If the complainant refuses to supply the requested information, a note will be made on the form and complainant advised of this.

2. Assess and Prioritise

The Communications and Community Liaison Representative will prioritise all complaints by considering the seriousness of the complaint including risk to health and safety and will attempt to provide an immediate response via phone or email. This will be undertaken in accordance with the CCS (SLR 2019).

3. Investigate

A field investigation will be initiated in an attempt to confirm details relevant to the complaint and the cause of the problem. Any air quality monitoring information and/or site records at and around the time of the complaint will be reviewed for any abnormality or incident that may have resulted in the complaint.

If the complaint is due to an incident, the notification requirements and handling procedures outlined in the CEMP respectively will be followed.

4. Action or Rectify

Once the cause of the complaint has been established, every possible effort will be made to undertake appropriate action to rectify the cause of the complaint and mitigate any further impact. The Communications and Community Liaison Representative will assess whether the complaint is founded or unfounded and delegate the remediation of the issue to the Contractor's Project Manager for action, as required.

As outlined in **Section 11**, if a complaint regarding air quality impacts is concluded to be substantiated, the need for any changes to the air quality mitigation measures identified for the Project in **Section 8** and/or the air quality monitoring programme outlined in **Section 10** is to be assessed and, the AQMP updated as appropriate.

5. Respond to Complainant

The Communications and Community Liaison Representative will oversee the rectification of the issue and respond to the complainant once the issue has been resolved. The complainant will be provided with a follow up verbal response on what action is proposed within two hours during night-time works (between the hours of 6:00 pm and 10:00 pm) and 24 hours at other times. Where a complaint cannot be resolved by the initial or follow-up verbal response, a written response will be provided to the complainant within ten days.

6. Record

It is imperative that an assessment of the situation is carried out and documented in order to minimise the potential for similar complaints in the future. On this basis, every complaint received is to be recorded in the Complaint Enquiry Form. A copy of the completed form will be maintained for at least five years. The complaint will also be recorded in the Complaints Register.

7. Preventative Action

Once the complaint has been suitably handled, appropriate measures will be identified and implemented to negate the possibility of re-occurrence. The Complaint Enquiry Form is not finalised until the preventative actions are completed and recorded on the form.

9.1.4 Complaints Register

A Complaints Register will be maintained during construction and will contain the following:

- A copy of the environmental complaint handling procedure;
- A separate reference sheet containing the contact details;
- Blank hard copies of the Complaint Enquiry Form; and
- Copies of all completed Complaint Enquiry Forms, which are to be maintained for at least five years after the event to which they relate.

10 Air Quality Monitoring Program

As discussed in **Section 7**, the risk of construction dust emissions causing nuisance impacts at off-site sensitive receptor locations is concluded to be low. It is also noted that any impacts will be temporary and managed through the implementation of appropriate mitigation measures (see **Section 8**).

While there is no stipulated requirement for air quality monitoring within SSD 7348, the RMS Environmental Protection Specification G36 (Condition 4.4.1) requires dust monitoring to be conducted during construction. Considering the low risk of the construction dust emissions causing nuisance at off-site sensitive receptor locations, dust monitoring at the nearest sensitive receptors is not considered to be warranted¹. However, due to the possibility of concurrent construction of the WNSLR and the OWE, dust deposition monitoring at the nearest sensitive receptors, in conjunction with routine daily onsite visual inspections is deemed to be appropriate for this Project.

In addition, Goodman have installed three continuous particulate (TSP & PM₁₀) monitors along the eastern OWE boundary. It is noted that while the samplers are installed in accordance with Australian Standard AS/NZS 3580.9.9, they are laser photometer instruments (aerosol samplers) and do not comply with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2006). They are therefore to be used as a management tool to warn of increasing ambient dust levels and the need to implement additional dust mitigation measures, but cannot be used as a compliance instrument to demonstrate compliance with the ambient air quality criteria.

The following monitoring will therefore be implemented for the Project:

- Dust deposition rates will be monitored using static dust gauges be conducted for the duration of this Project and started at six (6) locations around the WNSLR and OWE boundaries, plus one dust gauge as a background dust monitor.
- Dust deposition monitoring is to commence at least one month before commencement of construction work on site, to provide 'before construction' dust deposition levels.
- Real-time TSP and PM₁₀ sampling at three (3) locations along the OWE site boundary.

The background dust monitor will be located upwind and further away from the construction works, closer to the nearby sensitive receptors towards the northwest. As there is a possibility of concurrent construction of the OWE, dust gauges within the OWE area are not proposed due to the inherent risk of equipment safety (e.g. heavy machinery knocking down the dust gauge).

Indicative locations of the dust deposition gauges are shown in **Figure 5**. The exact locations of the gauges will depend on a number of factors, such as site accessibility, safety risk to equipment, distance from the construction works etc, and will need to be finalised by the dust monitoring contractor.

A summary of the proposed air quality monitoring program is shown in **Table 10**.

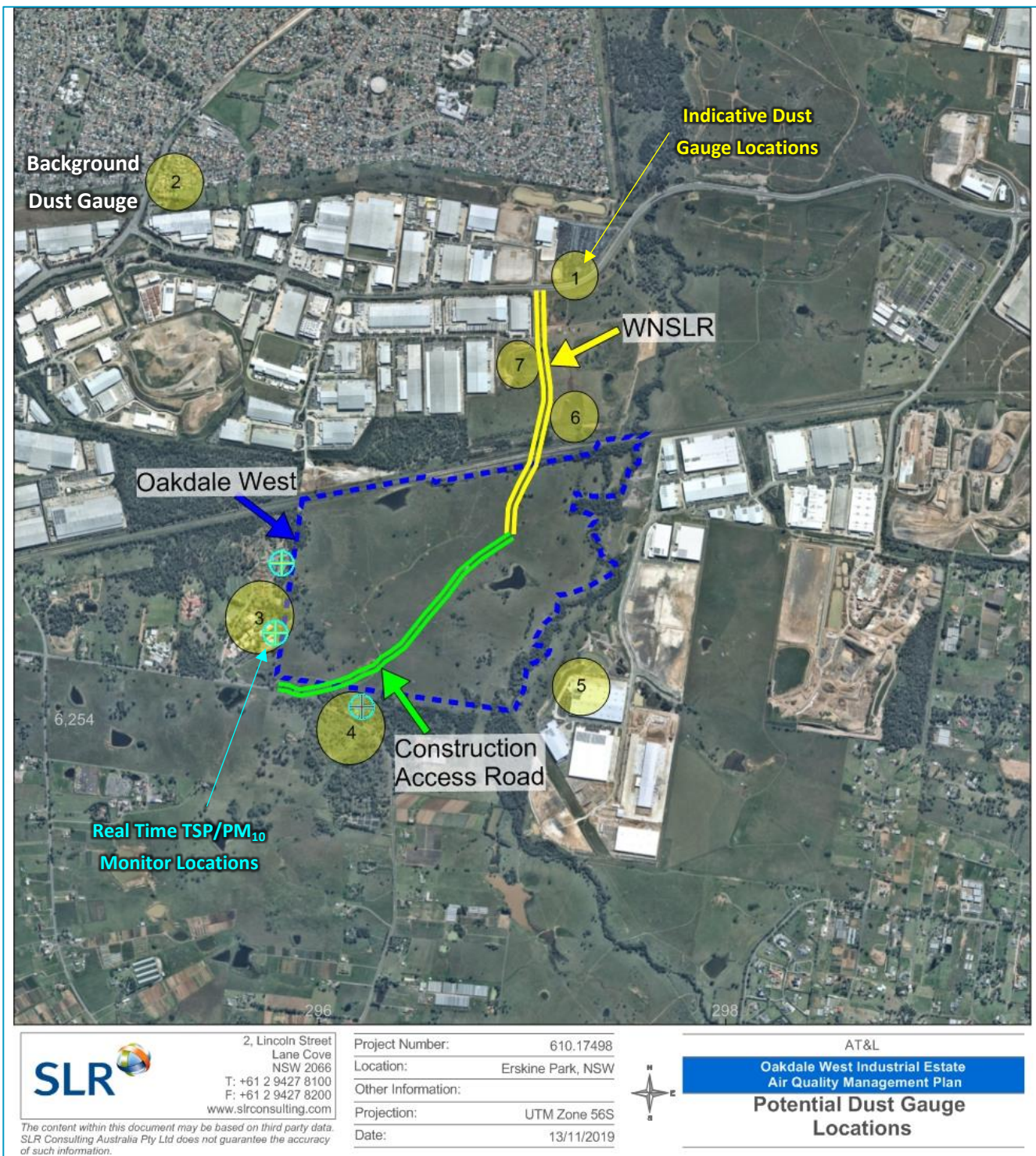
Table 10 Air Quality Monitoring Program

Description	Parameter	Methodology	Duration	Location	Frequency
Nuisance dust monitoring	Deposited dust in g/m ² /month	AS/NZS 3580.1.1:2016 - <i>Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment</i>	During site preparation, earthworks,	Indicative locations shown in	Monthly

¹ Note that dust monitoring at a sensitive receptor may be an appropriate action in response to a complaint.

			construction	Figure 5	
Suspended Particulate Monitoring	TSP and PM ₁₀ concentrations in µg/m ³	<p>Real-time monitoring using a light-scattering laser photometer (aerosol monitor). The monitors are to be calibrated every 6 months by co-locating a Low Volume Air Sampler (LVAS) at each monitoring location to derive a site-specific correction factor.</p> <p>LVAS calibration monitoring will be performed in accordance with: AS/NZS 3580.9.9 <i>Methods for Sampling and Analysis of Ambient Air – Determination of suspended particulate matter – PM₁₀ low volume sampler – Gravimetric Method</i></p>	During site preparation, earthworks, construction	Current locations shown in Figure 5	Continuous with 6-monthly calibration

Figure 5 Dust Monitoring Locations for the WNSLR Construction Project



In addition to the dust deposition monitoring, the contractor will:

- Perform daily on-site site inspections to visually assess dust levels. The inspection results are to be recorded in a daily log book, with the log to be available to the DPE when requested. The daily environmental inspections will include, but not be limited to:
 - Visual inspection of any airborne dust being generated on-site or being observed blowing off-site;
 - Ensure roads leaving the site are free of soil, and that there is no observable soil tracking onto the road network;
 - Inspection of the erosion and sediment control systems for silt build-up; and
 - Inspection of stockpiles and waste storage areas to ensure no significant wind erosion is observable.
- Review Horsley Park Bureau of Meteorology station daily weather forecast (i.e. wind, rain) to inform site dust management procedures.
- Carry out weekly site inspections to monitor compliance with this CAQMP, record inspection results, and make an inspection log available to the DPE when requested; and
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

A summary of the requirements of the site dust inspection programme is provided in **Table 11**.

Table 11 Air Quality Management – Visual Inspections

Description	Parameter	Methodology	Duration	Location	Frequency
Daily visual inspections	On-site dust generation, vehicle exhaust emissions and compliance with mitigation measures	<p>Visual inspection of dust-generating activities to:</p> <ul style="list-style-type: none"> - identify if any dust clouds can be seen leaving site etc; - check for smoky exhausts on vehicles and equipment operating on site; and - confirm compliance with air quality mitigation measures specified in this CAQMP. <p>Where excessive dust events occur (i.e. prolonged visual dust in a particular area) watering of dusty activities is to be undertaken or activities temporarily halted and then resumed once weather conditions have improved.</p> <p>Record inspection results and make an inspection log available to the DPE when asked.</p>	During site preparation, earthworks, construction	On-site within boundaries of the WNSLR construction area	Daily

11 Contingency Management Plan

The air quality contingency management plan for the WNSLR Project is shown in **Table 12**.

Table 12 Air Quality Contingency Management Plan for the WNSLR

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Visible dust leaving the site	Trigger	Daily inspections show that there is no visible dust leaving the site.	Daily inspections show that there is visible dust leaving the site.	Daily inspections show that there is visible dust leaving the site multiple times during a day OR from multiple locations within the site.
	Response	Continue monitoring program as normal.	<p>Review and investigate construction activities and respective control measures, where appropriate. Implement additional remedial measures, such as:</p> <ul style="list-style-type: none"> • Deployment of additional water sprays, water trucks etc • Relocation or modification of dust-generating sources 	Construction activities will be temporary halted and only resumed when conditions have improved

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Dust deposition reading of $>4\text{g/m}^2/\text{month}$	Trigger	Dust deposition rates are less than $4\text{g/m}^2/\text{month}$ at all the dust gauges.	Dust deposition rate greater than $4\text{g/m}^2/\text{month}$ is recorded by any of the dust gauges	Dust deposition rates greater than $4\text{g/m}^2/\text{month}$ are recorded by two or more dust gauges for two months in a row.
	Response	Continue monitoring program as normal.	<ul style="list-style-type: none"> Review and investigate construction activities and respective control measures. If it is concluded that construction activities were directly responsible for the exceedance (ie the exceedance event was not caused due to high regional dust levels or local non-project dust source), submit an incident report to government agencies. Increase dust suppression measures (additional watering, covering stockpiles etc) to avoid such occurrence in future. 	Implement real-time monitoring of dust levels using a continuous monitor (eg Dustrack or eBAM), to assist with real time management of construction dust. Update this CAQMP accordingly to include these additional monitoring requirements.
Complaints received regarding nuisance dust	Trigger	There are no complaints received during the construction	An air-quality related complaint is received from a nearby resident	Further complaints are received after the additional mitigation measures have been implemented
	Response	Continue monitoring program as normal.	<ul style="list-style-type: none"> Report the complaint to the regulator, in line with complaints handling procedure (See Section 9). Review and investigate construction activities and increase dust suppression measures (additional watering, covering stockpiles etc), where appropriate. 	<ul style="list-style-type: none"> Implement real-time monitoring of dust levels using a continuous monitor (eg Dustrack or eBAM), to assist with real time management of construction dust. Update this CAQMP accordingly to include these additional monitoring requirements. The location of the real-time dust monitor will be determined by the complainant location.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
Real-time suspended particulate matter monitoring (TSP and PM ₁₀)	Trigger	1-hour average PM ₁₀ concentrations < 100 µg/m ³	1-hour average PM ₁₀ concentrations >100 µg/m ³ but <200 µg/m ³	1-hour average PM ₁₀ concentrations >200 µg/m ³
	Response	Continue monitoring program as normal.	<p>Review and investigate construction activities and respective control measures, where appropriate. Implement additional remedial measures, such as:</p> <ul style="list-style-type: none"> • Deployment of additional water sprays, water trucks etc • Relocation or modification of dust-generating sources • Record findings of investigations and actions taken to reduce dust levels • Continue to closely monitor dust levels to ensure they are decreasing <p>If exceedances are due to regional dust event (fire, dust storm etc) – still take action to minimise dust from the site but also record details of the cause of the elevated background levels.</p>	<ul style="list-style-type: none"> • Construction activities will be temporary halted and only resumed when conditions have improved.

12 Roles and Responsibilities

Overall roles and responsibilities relating to the project are outlined in Section 3.2 of the overarching CEMP.

The key responsibilities specifically for dust management are as follows:

12.1 Project Manager

- Ensuring appropriate resources are available for the implementation of this CAQMP;
- Providing assistance and advice to the Site Superintendent to fulfil the requirements of this Plan, assessing data from inspections and providing project-wide advice to ensure consistent approach and outcomes are achieved;
- Providing necessary training for project personnel to cover air quality management;
- Reviewing and update of this CAQMP; and
- Commissioning a suitably qualified consultant to install and maintain the PM₁₀ monitors, and any other dust monitoring systems identified as being required.

12.2 Site Superintendent

- Assessing and (as required) mitigating risks of elevated dust levels before commencing works each day and ensuring that the appropriate controls are implemented and effective;
- Reviewing weather forecasts and current observations of meteorological conditions (as recorded at Horsley Park AWS);
- Throughout the day, visually assessing the dust levels and the effectiveness of any dust controls implemented, making adjustments accordingly;
- Ceasing works in the event of excessive dust generation due to extreme weather conditions or inadequately controlled construction activities (eg high winds, surface dirt accumulation, etc.); and
- In the event that an air quality complaint is received, the Site Superintendent will conduct an investigation in accordance with the complaint handling procedure (see **Section 9**).

12.3 All Workers on Site

- Observing any dust emission control instructions and procedures that apply to their work;
- Taking action to prevent or minimise dust emission incidents; and
- Identifying and reporting dust emission incidents.

13 Review and Improvement of the CAQMP

The review of the CAQMP will be undertaken at least quarterly and will include participation by Goodman. The review will comprise, as a minimum, the following:

- Identification of areas of opportunity for improved environmental performance;
- Analysis of the causes of any recorded non-compliances, including those identified in environment inspections and audits;
- Verification of the effectiveness of corrective and preventative actions; and
- Highlighting any changes in procedures resulting from process improvement.

This CAQMP will also be reviewed and, if necessary, revised in the following circumstances:

- Where there is any change to the scope of the construction activities and/or disturbance footprint;
- Where it is identified that the environmental performance is not meeting the objectives of the CAQMP;
- In the event of a substantiated complaint being received regarding air quality impacts; and/or
- At the request of a relevant regulatory authority.

14 References

- DEC 2006, Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales, Department of Environment and Conservation NSW, December 2006.
- EPA 2017, Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, Environment Protection Authority NSW, January 2017.
- EPA 2018, Local Government Air Quality Toolkit, Module 3 – Guidelines for Managing Air Pollution, Part 3 – Guidance Notes for Construction Sites, available online at <https://www.epa.nsw.gov.au/your-environment/air/air-nsw-overview/local-government-air-quality-toolkit>, accessed on 17 July 2018.
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APPENDIX A

WIND ROSES AND RAINFALL DATA ANALYSIS

Wind Conditions

Local wind speed and direction influence the dispersion of air pollutants. Wind speed determines both the distance of downwind transport and the rate of dilution as a result of 'plume' stretching. Wind direction, and the variability in wind direction, determines the general path pollutants will follow and the extent of crosswind spreading. Surface roughness (characterised by features such as the topography of the land and the presence of buildings, structures and trees) will also influence dispersion.

The Bureau of Meteorology (BoM) maintains and publishes data from weather stations across Australia. The closest such station recording wind speed and wind direction data is the Horsley Park Automatic Weather Station (AWS) (Station ID 67119), located approximately 5.5 kilometres (km) southeast of the WNSLR. Considering the relatively flat terrain between WNSLR and Horsley Park AWS, it is considered reasonable to assume that the wind conditions recorded at the Horsley Park AWS are representative of the wind conditions experienced at the WNSLR.

Annual wind roses for the years 2014 to 2018 compiled from data recorded by the Horsley Park AWS are presented in **Figure A1**, with seasonal wind roses for 2018 presented in **Figure A2**. Wind roses show the frequency of occurrence of winds by direction and strength. The bars correspond to the 16 compass points (degrees from North). The bar at the top of each wind rose diagram represents winds blowing from the north (i.e. northerly winds), and so on. The length of the bar represents the frequency of occurrence of winds from that direction, and the widths of the bar sections correspond to wind speed categories, the narrowest representing the lightest winds. Thus it is possible to visualise how often winds of a certain direction and strength occur over a long period, either for all hours of the day, or for particular periods during the day.

The 'Beaufort Wind Scale' (consistent with terminology used by the BoM) presented in **Table A1** was used to describe the wind speeds experienced at the WNSLR.

Table A1 Beaufort Wind Scale

Beaufort Scale #	Description	m/s	Description on land
0	Calm	0-0.5	Smoke rises vertically
1	Light air	0.5-1.5	Smoke drift indicates wind direction
2-3	Light/gentle breeze	1.5-5.3	Wind felt on face, leaves rustle, light flags extended, ordinary vanes moved by wind
4	Moderate winds	5.3-8.0	Raises dust and loose paper, small branches are moved
5	Fresh winds	8.0-10.8	Small trees in leaf begin to sway, crested wavelets form on inland waters
6	Strong winds	>10.8	Large branches in motion, whistling heard in telephone wires; umbrellas used with difficulty

Source: <http://www.bom.gov.au/lam/glossary/beaufort.shtml>

The annual wind roses for the years 2014 to 2018 (**Figure A1**) indicate that predominant wind directions in the area are consistently from the southwest quadrant. Very low frequencies of winds from the north-eastern quadrant were recorded across all years. The annual frequency of calm wind conditions was recorded to be approximately 12%-14.5% for all the years between 2014 and 2018.

A review of the annual wind roses (**Figure A1**) indicates that:

- Winds that would blow fugitive dust emissions from the demolition/construction works towards the nearest sensitive receptors located to the north and northwest of the proposed construction activities occur approximately 15-20% of the time.

The seasonal wind roses for the year 2018 (**Figure A2**) indicate that:

- In summer, wind speeds ranged from calm to fresh winds (between 0.5 m/s and 9.8 m/s). The majority of winds originated from eastern and south eastern quadrants, with very few winds from western directions. Calm wind conditions were recorded approximately 13% of the time during summer.
- In autumn, wind speeds ranged from calm to fresh winds (between 0.5 m/s and 8.9 m/s). The majority of winds originated from southwest quadrant, with very few winds from north eastern directions. Calm wind conditions were observed to occur approximately 16% of the time during autumn.
- In winter, wind speeds ranged from calm to fresh winds (between 0.5 m/s and 8.6 m/s). The majority of winds originated from southwest quadrant, with very few winds from northeast and east directions. Calm wind conditions were observed to occur approximately 16% of the time during winter.
- In spring, wind speeds ranged from calm to fresh winds (between 0.5 m/s and 9.8 m/s). The frequency of winds are mostly even in each directions, with relatively low frequency of winds originating from northwest quadrant. Calm wind conditions were observed to occur approximately 14% of the time during spring.

Wind erosion of dust from exposed surfaces (ie, during the construction phase of the development) is usually initiated when wind speeds exceed the threshold friction velocity for a given surface or material, however a general rule of thumb is that wind erosion can be expected to occur above 5 m/s (USEPA 2006). The frequency of wind speeds for the period of 2014-2018 is presented in **Figure A3**. The plot showed that the frequency of wind speeds exceeding 5 m/s for the period 2014-2018 at Horsley Park AWS was approximately 6%.

Figure A1 Annual Wind Roses for Horsley Park (2014 to 2018)

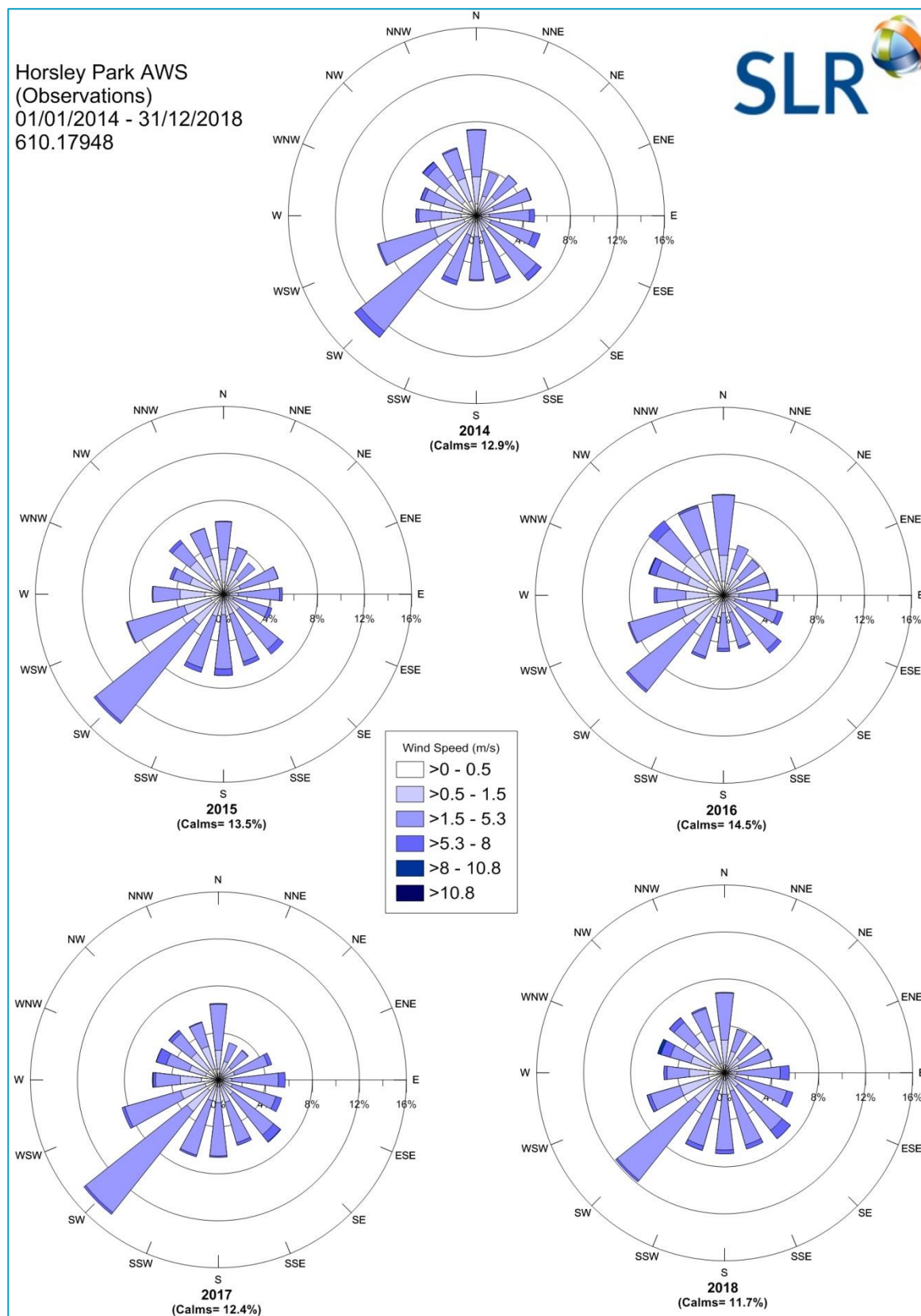


Figure A2 Annual and Seasonal Wind Roses for Horsley Park (2018)

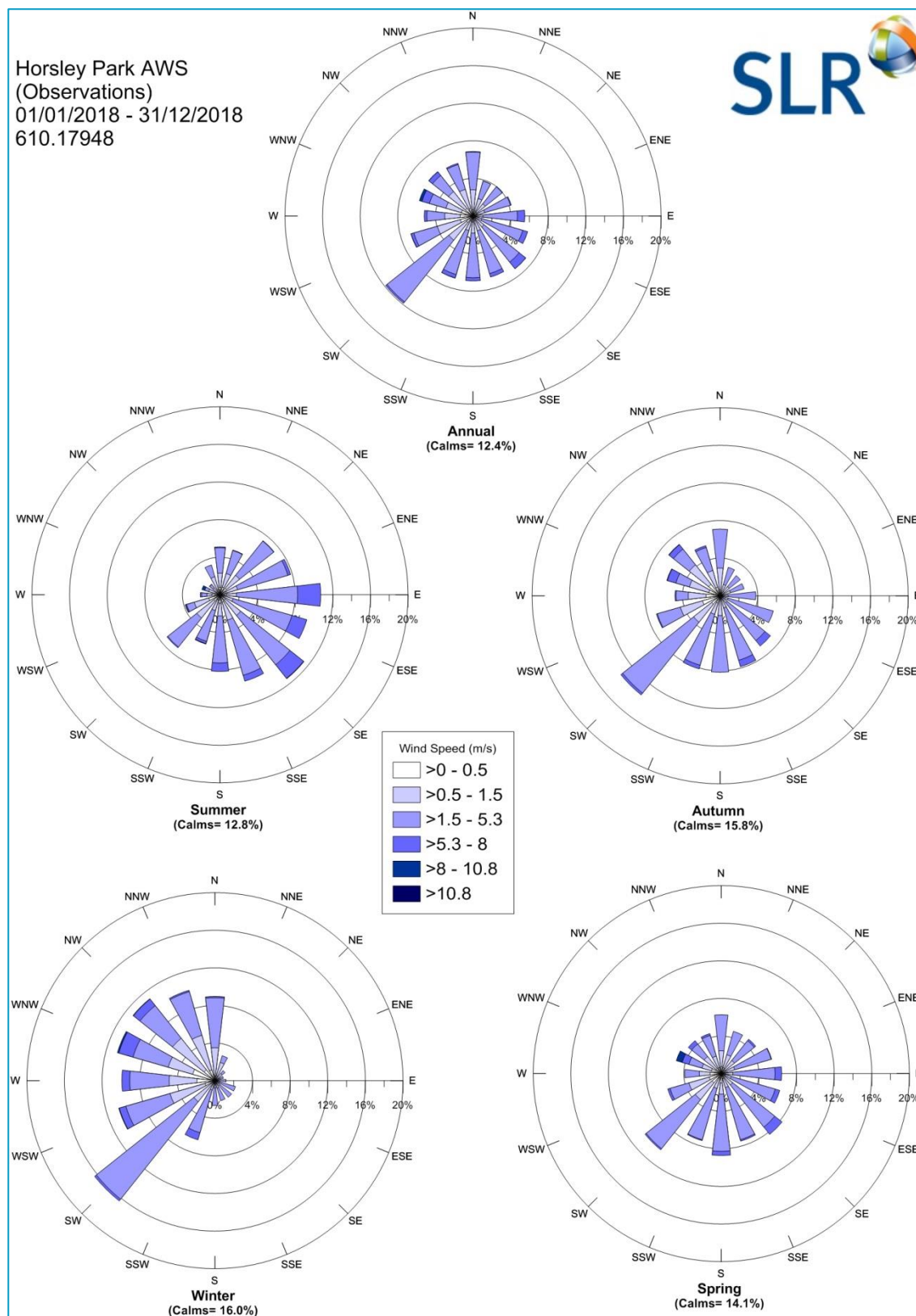
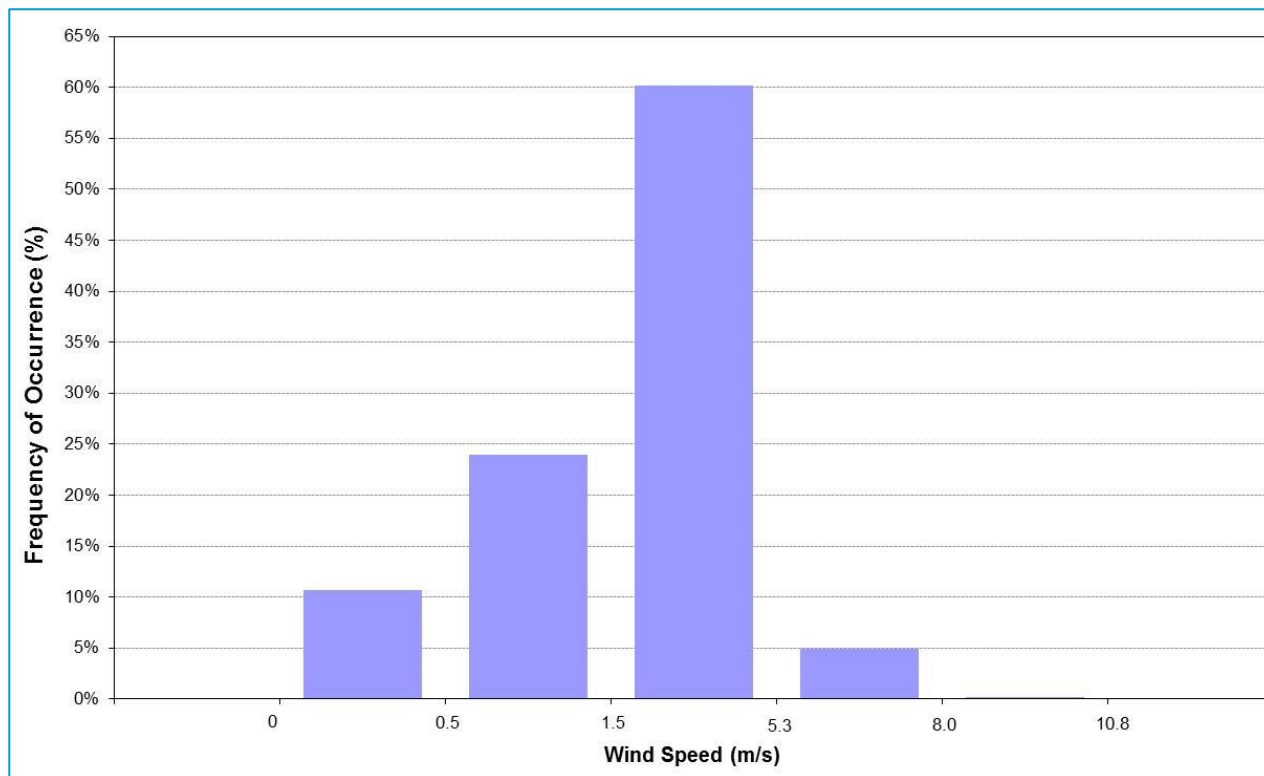


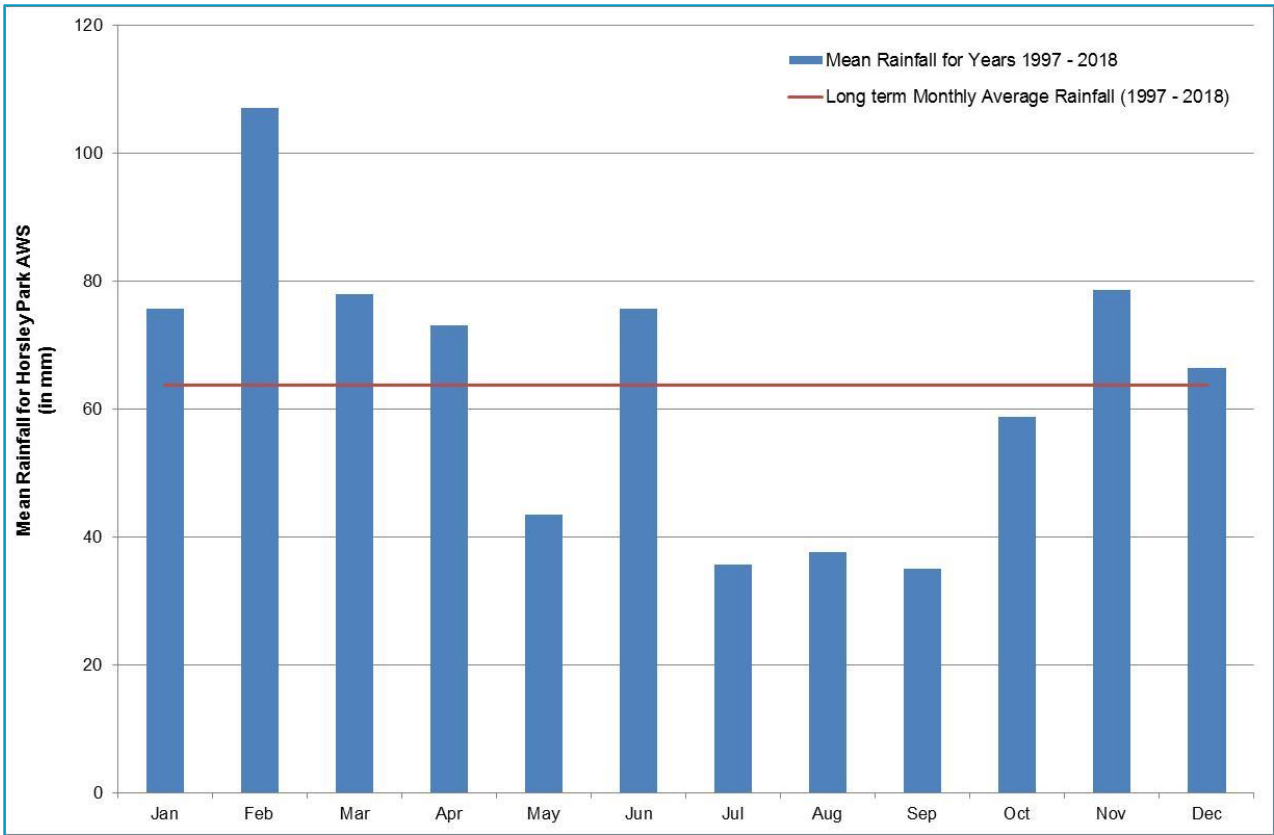
Figure A3 Wind Speed Frequency Chart for Horsley Park AWS – 2014-2018



Rainfall

Dry periods (no rainfall) have the greatest potential for fugitive dust emissions during construction. The long term monthly rainfall averages recorded at Horsley Park AWS rain gauge are shown in **Figure A4**. It is noted that generally rainfall is relatively low in mid-winter to mid spring periods. This rainfall pattern suggests that dust emissions from the demolition/construction activities at the WNSLR have the greatest potential to impact on receptors for the period of late autumn to early spring.

Figure A4 Long term Mean Rainfall for Horsley Park AWS – 1997 to 2018



APPENDIX B

CURRICULUM VITAE OF AUTHOR

APPENDIX C

CONSTRUCTION PHASE RISK ASSESSMENT METHODOLOGY

Step 1 – Screening Based on Separation Distance

The Step 1 screening criteria provided by the IAQM guidance suggests screening out any assessment of impacts from construction activities where sensitive receptors are located more than 350 m from the boundary of the site, more than 50 m from the route used by construction vehicles on public roads and more than 500 m from the site entrance. This step is noted as having deliberately been chosen to be conservative, and will require assessments for most projects.

As noted in **Section 3.3**, the nearest sensitive receptor is located approximately 500 m from the nearest WNSLR boundary.

The screening criteria for detailed assessment are:

- a ‘human receptor’ within:
 - 350 m of the boundary of the site; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).
- an ‘ecological receptor’ within:
 - 50 m of the boundary of the site; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

Sensitive receptors (residences) are located beyond 350 m from the boundary of the WNSLR and beyond 50 m from the route used by construction vehicles on public roads, however the nearest sensitive receptor is located within 500 m of the site entrance, therefore further assessment is required.

Step 2a – Assessment of Scale and Nature of the Works

Step 2a of the assessment provides “dust emissions magnitudes” for each of four dust generating activities; demolition, earthworks, construction, and track-out (the movement of site material onto public roads by vehicles). The magnitudes are: *Large*; *Medium*; or *Small*, with suggested definitions for each category. The definitions given in the IAQM guidance for earthworks, construction activities and track-out, which are most relevant to this Development, are as follows:

Demolition (Any activity involved with the removal of an existing structure [or structures]. This may also be referred to as de-construction, specifically when a building is to be removed a small part at a time):

- **Large:** Total building volume >50,000 m³, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level;
- **Medium:** Total building volume 20,000 m³ – 50,000 m³, potentially dusty construction material, demolition activities 10-20 m above ground level; and

- **Small:** Total building volume <20,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks (*Covers the processes of soil-stripping, ground-levelling, excavation and landscaping*):

- **Large:** Total site area greater than 10,000 m², potentially dusty soil type (eg clay, which will be prone to suspension when dry due to small particle size), more than 10 heavy earth moving vehicles active at any one time, formation of bunds greater than 8 m in height, total material moved more than 100,000 t.
- **Medium:** Total site area 2,500 m² to 10,000 m², moderately dusty soil type (eg silt), 5 to 10 heavy earth moving vehicles active at any one time, formation of bunds 4 m to 8 m in height, total material moved 20,000 t to 100,000 t.
- **Small:** Total site area less than 2,500 m², soil type with large grain size (eg sand), less than five heavy earth moving vehicles active at any one time, formation of bunds less than 4 m in height, total material moved less than 20,000 t, earthworks during wetter months.

Construction (*Any activity involved with the provision of a new structure (or structures), its modification or refurbishment. A structure will include a residential dwelling, office building, retail outlet, road, etc*):

- **Large:** Total building volume greater than 100,000 m³, piling, on site concrete batching; sandblasting.
- **Medium:** Total building volume 25,000 m³ to 100,000 m³, potentially dusty construction material (eg concrete), piling, on site concrete batching.
- **Small:** Total building volume less than 25,000 m³, construction material with low potential for dust release (eg metal cladding or timber).

Track-out (*The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network*):

- **Large:** More than 50 heavy vehicle movements per day, surface materials with a high potential for dust generation, greater than 100 m of unpaved road length.
- **Medium:** Between 10 and 50 heavy vehicle movements per day, surface materials with a moderate potential for dust generation, between 50 m and 100 m of unpaved road length.
- **Small:** Less than 10 heavy vehicle movements per day, surface materials with a low potential for dust generation, less than 50 m of unpaved road length.

Note: No demolition of existing structures will be performed as part of this Development.

In order to provide a conservative assessment of potential impacts, it has been assumed that if at least one of the parameters specified in the 'large' definition is satisfied, the works are classified as large, and so on.

Based on the above, dust emission magnitudes have been categorised as presented in **Table C1**.

Table C1 Categorisation of Dust Emission Magnitude

Activity	Dust Emission Magnitude	Basis
Demolition	Small	<p>IAQM Definition: Total building volume <20,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.</p> <p>Relevance to this Project: <i>There are no sheds to be demolished as part of constructing the WNSLR, however small old infrastructure (such as old electric poles) that may require relocation.</i></p>
Earthworks	Large	<p>IAQM Definition: Total site area greater than 10,000 m², potentially dusty soil type (eg clay, which will be prone to suspension when dry due to small particle size), more than 10 heavy earth moving vehicles active at any one time, formation of bunds greater than 8 m in height, total material moved more than 100,000 t.</p> <p>Relevance to this Project: <i>Total area where the earthworks will be undertaken for the WNSLR is estimated to be greater than 30,000 m². This is based on proposed WNSLR dimensions of 1 km length and 30 m width.</i></p>
Construction	Medium	<p>IAQM Definition: Total building volume 25,000 m³ to 100,000 m³, potentially dusty construction material (eg concrete), piling, on site concrete batching.</p> <p>Relevance to this Project: <i>Although there are no new buildings proposed as part of the WNSLR construction, the total volume of road is estimated to be approximately 30,000 m³. This is based on road area of 30,000 m² and average depth of 1 m.</i></p>
Trackout	Medium	<p>IAQM Definition: Between 10 and 50 heavy vehicle movements per day, surface materials with a moderate potential for dust generation, between 50 m and 100 m of unpaved road length.</p> <p>Relevance to this Project: <i>The traffic volume during construction is estimated to be 20 vehicle movements per hour.</i></p>

Step 2b – Risk Assessment

Assessment of the Sensitivity of the Area

Step 2b of the assessment process requires the sensitivity of the area to be defined. The sensitivity of the area takes into account:

- The specific sensitivities that identified sensitive receptors have to dust deposition and human health impacts;
- The proximity and number of those receptors;
- In the case of PM₁₀, the local background concentration; and
- Other site-specific factors, such as whether there are natural shelters such as trees to reduce the risk of wind-blown dust.

Individual receptors are classified as having *high*, *medium* or *low* sensitivity to dust deposition and human health impacts (ecological receptors are not addressed using this approach). The IAQM method provides guidance on the sensitivity of different receptor types to dust soiling and health effects as summarised in **Table C1**. It is noted that user expectations of amenity levels (dust soiling) is dependent on existing deposition levels.

Table C2 IAQM Guidance for Categorising Receptor Sensitivity

Value	High Sensitivity Receptor	Medium Sensitivity Receptor	Low Sensitivity Receptor
Dust soiling	Users can reasonably expect a high level of amenity; or The appearance, aesthetics or value of their property would be diminished by soiling, and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods as part of the normal pattern of use of the land.	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or The appearance, aesthetics or value of their property could be diminished by soiling; or The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	The enjoyment of amenity would not reasonably be expected; or Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.
	<i>Examples: Dwellings, museums, medium and long term car parks and car showrooms.</i>	<i>Examples: Parks and places of work.</i>	<i>Examples: Playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.</i>
Health effects	Locations where the public are exposed over a time period relevant to the air quality objective for PM ₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM ₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	Locations where human exposure is transient.
	<i>Examples: Residential properties, hospitals, schools and residential care homes.</i>	<i>Examples: Office and shop workers, but will generally not include workers occupationally exposed to PM10.</i>	<i>Examples: Public footpaths, playing fields, parks and shopping street.</i>

According to the IAQM methods, the sensitivity of the identified individual receptors (as described above) is then used to assess the *sensitivity of the area* surrounding the active construction area, taking into account the proximity and number of those receptors, and the local background PM₁₀ concentration (in the case of potential health impacts) and other site-specific factors. Additional factors to consider when determining the sensitivity of the area include:

- any history of dust generating activities in the area;

- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between the source and the receptors;
- any conclusions drawn from analysing local meteorological data which accurately represent the area and if relevant, the season during which the works will take place;
- any conclusions drawn from local topography;
- the duration of the potential impact (as a receptor may be willing to accept elevated dust levels for a known short duration, or may become more sensitive or less sensitive (acclimatised) over time for long-term impacts); and
- any known specific receptor sensitivities which go beyond the classifications given in the IAQM document.

Based on the criteria listed in **Table C2**, the sensitivity of the identified receptors in this study is concluded to be *high* for health impacts and *high* for dust soiling, as they include residential areas where people may be reasonably expected to be present continuously as part of the normal pattern of land use.

The IAQM guidance for assessing the sensitivity of an area to dust soiling is shown in **Table C3**. The sensitivity of the area should be derived for each of activity relevant to the project (ie construction and earthworks).

Table C3 IAQM Guidance for Categorising the Sensitivity of an Area to Dust Soiling Effects

Receptor Sensitivity	Number of receptors	Distance from the source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Note: Estimate the total number of receptors within the stated distance. Only the *highest level* of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors < 20m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors < 50 m is 102. The sensitivity of the area in this case would be high.

A modified version of the IAQM guidance for assessing the *sensitivity of an area* to health impacts is shown in **Table C4**. For high sensitivity receptors, the IAQM methods takes the existing background concentrations of PM₁₀ (as an annual average) experienced in the area of interest into account and is based on the air quality objectives for PM₁₀ in the UK. As these objectives differ from the ambient air quality criteria adopted for use in this assessment (ie an annual average of 19.4 µg/m³ for PM₁₀) the IAQM method has been modified slightly.

This approach is consistent with the IAQM guidance, which notes that in using the tables to define the *sensitivity of an area*, professional judgement may be used to determine alternative sensitivity categories, taking into account the following factors:

- any history of dust generating activities in the area;
- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between the source and the receptors;

- any conclusions drawn from analysing local meteorological data which accurately represent the area, and if relevant the season during which the works will take place;
- any conclusions drawn from local topography;
- duration of the potential impact; and
- any known specific receptor sensitivities which go beyond the classifications given in this document.

Table C4 IAQM Guidance for Categorising the Sensitivity of an Area to Dust Health Effects

Receptor sensitivity	Annual mean PM ₁₀ conc.	Number of receptors ^{a,b}	Distance from the source (m)				
			<20	<50	<100	<200	<350
High	>25 µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	21-25 µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	17-21 µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<17 µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>25 µg/m ³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	21-25 µg/m ³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	17-21 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<17 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Notes:

(a) Estimate the total within the stated distance (e.g. the total within 350 m and not the number between 200 and 350 m); noting that only the highest level of area sensitivity from the table needs to be considered.

(b) In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties.

As noted in **Section 3.3**, the nearest sensitive receptor is located approximately 500 m from the nearest WNSLR boundary. Based on the classifications shown in **Table C3** and **Table C4**, the sensitivity of the area to dust soiling and to health effects may both be classified as '*low*'. This categorisation has been made considering the individual receptor sensitivities derived above, the annual mean background PM₁₀ concentration of 19.4 µg/m³ recorded at St Marys AQMS (see **Section 6.2**) and the anticipated number of sensitive receptors present in the vicinity of the WNSLR.

Risk Assessment

The dust emission magnitude from Step 2a and the receptor sensitivity from Step 2b are then used in the matrices shown in **Table C5** (earthworks and construction), **Table C6** (track-out) and **Table C7** (demolition) to determine the risk category with no mitigation applied.

Table C5 Risk Category from Earthworks and Construction Activities

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table C6 Risk Category from Track-out Activities

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Table C7 Risk Category from Demolition Activities

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

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APPENDIX L

Construction Traffic Management Plan

Prepared for

Goodman Property Services (Aust) Pty Ltd

Construction Traffic Management Plan

WNSLR, Erskine Park
(Western North South Link Road)

Ref: 0605r01v14
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	E)	WaterNSW Approval

1 Introduction

1.1 Overview

Ason Group has been engaged by Goodman Property Services (Aust) Pty. Limited to prepare a Construction Traffic Management Plan (CTMP) relating to construction of the Western North South Link Road (WNSLR) at Erskine Park. A location plan is provided in **Figure 1**.

The WNSLR is proposed as part of a State Significant Development (SSD 7348), with an overview of the proposed road provided in **Figure 2**. It is intended that the WNSLR provide a connection between Lenore Drive and the future Southern Link Road (SLR) currently under investigation and planning by Roads and Maritime Services (RMS) on behalf of the Department of Planning, Industry & Environment (DPIE). In the short-term the WNSLR will be a public road, owned by Council, providing local access to the future Oakdale West Estate and other industrial areas north of the Water NSW Pipeline.

Construction of roads and other infrastructure required to support the Oakdale West Estate is covered under a separate Construction Traffic Management Plan. The effect of this construction and associated traffic movements will be cumulative in nature, and therefore shall be discussed within this CTMP.

Notwithstanding, given the concurrent activities, regular engagement between contractors (if being undertaken by separate entities) should be undertaken to ensure the works are managed in an integrated manner.

1.2 Report Purpose

The purpose of this report is to detail a traffic plan for construction that seeks:

- To minimise traffic impacts on the surrounding road network,
- Ensure safety and efficiency for workers, pedestrians, other road users, and
- Provide information regarding the construction vehicle access routes and any changed road conditions (if applicable).

It is expected that this plan will be updated should any necessary changes to the currently proposed arrangements arise in the future. Any special events (if required) would be subject to a separate request for a specific permit not covered by this report.

Ason is responsible for the preparation of this Plan only and not for its implementation, which is the responsibility of the Contractor.

In accordance with Condition D65 of the consent, no works can commence until a CTMP report is approved by the Planning Secretary of the Department of Planning, Industry & Environment.



Figure 1: Site Location

1.3 Statutory Requirements

1.3.1 Specific Conditions of Consent

The following conditions have been imposed with respect to construction traffic management.

Table 1: SSD 7348 Approval - Compliance Table

Reference	Requirement	Response
D65	Prior to the commencement of Stage 1, the Applicant must prepare a Construction Traffic Management Plan (CTMP) for the Development to the satisfaction of the Planning Secretary. The CTMP must form part of the CEMP required by Condition D111 and must:	
	a) be prepared by a suitably qualified and experienced person(s)	Consultants from Ason Group are suitably qualified Traffic Engineers, with relevant "Prepare a Work Zone Traffic Management Plan" accreditation.
	b) be prepared in consultation with Council, Mamre Anglican School, Emmaus Catholic College, Emmaus Catholic Care Village and Trinity Catholic Primary School	Consultation with all listed (and other) stakeholders is a requirement of this CTMP. Refer Section 6.3. Additional consultation has been undertaken, with evidence provided within Appendix D
	c) detail specific measures to manage construction traffic to avoid school drop-off and pick up times (Monday to Friday 8 am – 9.30 am and 2.30 pm – 4 pm, and Higher School Certificate exam periods) including any temporary infrastructure arrangements and traffic safety measures;	Refer Section 3.1.5. Where possible, deliveries and contractor movements will be scheduled to avoid these periods. For these movements that are required, Heavy vehicles will be directed to use Aldington Road to access Mamre road and thus not pass directly past the neighbouring schools during these periods.
	d) detail the measures to be implemented to ensure road safety and network efficiency during construction, including scheduling deliveries of heavy plant and equipment outside of peak periods, or during school holidays where possible.	Refer Section 5.2 with regard to impacts to traffic efficiency. This concludes that the construction traffic will not have a detrimental impact on the network. Furthermore, Traffic Control Plans (TCPs) shall be developed for all works impact public roads and approved by the Roads and Maritime Service Traffic Management Centre. A copy of the TCP will be provided to WaterNSW once approved
	e) detail heavy vehicle routes, access and parking arrangements;	The site access arrangements – relevant to each stage - are outlined in subsequent sections of this report (Refer Section 3).
	f) 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, including the students, staff, visitors and residents of the neighbouring schools and aged care village; (iii) minimise road traffic noise, both on Bakers Lane and from construction vehicles on Site; and (iv) ensure truck drivers use specified routes and adhere to the speed restrictions on Bakers Lane;	A driver Code of Conduct is a requirement of and included within this CTMP. The Drivers Code of Conduct (included in Section 4) addresses ways to minimise the impacts on the road network, with other road users, ensure truck routes are utilised and to manage pedestrian movements.

Reference	Requirement	Response
	g) include a program to monitor the effectiveness of these measures	The Contractor shall include a program to monitor the effectiveness of the measures. 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. These programs will be completed in accordance with Section 6.1.
	h) detail procedures for notifying residents and the community (including local schools), of any potential disruptions to routes.	Previous communication with stakeholders have been included within Appendix A. The Contractor will notify the community liaison representative when traffic conditions are expected to exceed parameters with within Condition Green of Table 6. Measures that may be included within the strategy have been identified within Section 6.3. Meetings are to be undertaken on a regular basis to keep key stakeholders informed of any upcoming events Reference should also be made to the Community Consultation Strategy prepared by SLR.
D66	The Applicant must:	
	a) not commence construction of Stage 1 until the CTMP required by Condition D65 is approved by the Planning Secretary; and	Note
	b) implement the most recent version of the CTMP approved by the Planning Secretary for the duration of construction.	Refer Section 6.1 of this Plan which outlines requirement for this Plan to be updated regularly.
D118	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
	a) details of: <ul style="list-style-type: none"> i. the relevant statutory requirements (including any relevant approval, licence or lease conditions); ii. any relevant limits or performance measures and criteria; and iii. the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; 	Relevant requirements are outlined in this table. Other Phase specific requirements are detailed in Section 3.
	b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Refer Section 3.
	c) program to monitor and report on the: <ul style="list-style-type: none"> i. impacts and environmental performance of Stage 1; and ii. effectiveness of the management measures set out pursuant to paragraph (b) above; 	Refer Section 6.1 of this Plan which outlines requirement for this Plan to be updated regularly.

Reference	Requirement	Response
	d) 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;	Refer Section 6.1 of this Plan which outlines requirement for this Plan to be updated regularly. Traffic Control Plans — outlined in Section 3.2.6 — shall be prepared to respond to specific work situations and subject to approval by the relevant Roads Authority (Council and/or RMS), providing a suitable level of independent oversight.
	e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time	Refer Section 6.1 of this Plan which outlines requirement for this Plan to be updated regularly.
	f) a protocol for managing and reporting any: <ul style="list-style-type: none"> i. incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); ii. complaint; iii. failure to comply with statutory requirements; and 	Management and reporting protocols are outlined in the Construction Environmental Management Plan. Reference is also made to Section 6.2 of this Plan in relation to incident management.
	g) a protocol for periodic review of the plan.	Refer Section 6.1 of this Plan.

Refer to the DPIE's Major Project Assessments [website](#) for a full list of all conditions of approval and other background documents.

1.4 Overview of Works

1.4.1 Hours of Work

Having regard for the conditions D70 of the consent, the permitted hours of works, unless otherwise agreed in writing by the Planning Secretary, is as follows:

- 7:00AM – 6:00PM Monday – Friday;
- 8:00AM – 1:00PM Saturday; and
- No work Sunday or public holidays.

In accordance with Condition D71, work outside the hours above may be undertaken in the following circumstances:

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

1.4.2 Works Stages

Work is expected to occur over a total construction period of approximately 12 months.

For the purposes of this CTMP, WNSLR works are broadly grouped as the following Phases:

1. WSNLR (North)
2. Water NSW pipeline bridge (Bridge Crossing)
3. WNSLR (South)

It is anticipated that all phases shall occur concurrently. The access and traffic management required for each Phase is outlined separately for each stage later within this report.

1.4.3 Access Arrangements

Access to WNSLR (north) shall initially occur via Old Wallgrove Road.

Access to WNSLR (South) shall occur from Lenore Drive, via a new construction access road that is to be built during preliminary stages of the works along the future Southern Link Road alignment. This will be separate to the OWE access from Bakers Lane. Furthermore, access to the Water NSW corridor shall occur via Old Wallgrove Road

Bakers Lane is the primary access point for these works with works arriving to site from Mamre Road to the west. All construction vehicles are to use the primary access from Bakers Lane. A secondary access route is proposed from Aldington Road (to the south-west of the access gate).

Where possible, deliveries and contractor movements will be scheduled to avoid these periods. For these movements that are required, Heavy vehicles will be directed to use Aldington Road to access Mamre road and thus not pass directly past the neighbouring schools during these periods. The monitoring strategies outlined within Section 6 shall ensure that deliveries are scheduled outside of the school zone hours in order to avoid any additional conflicts between construction vehicles and the school.

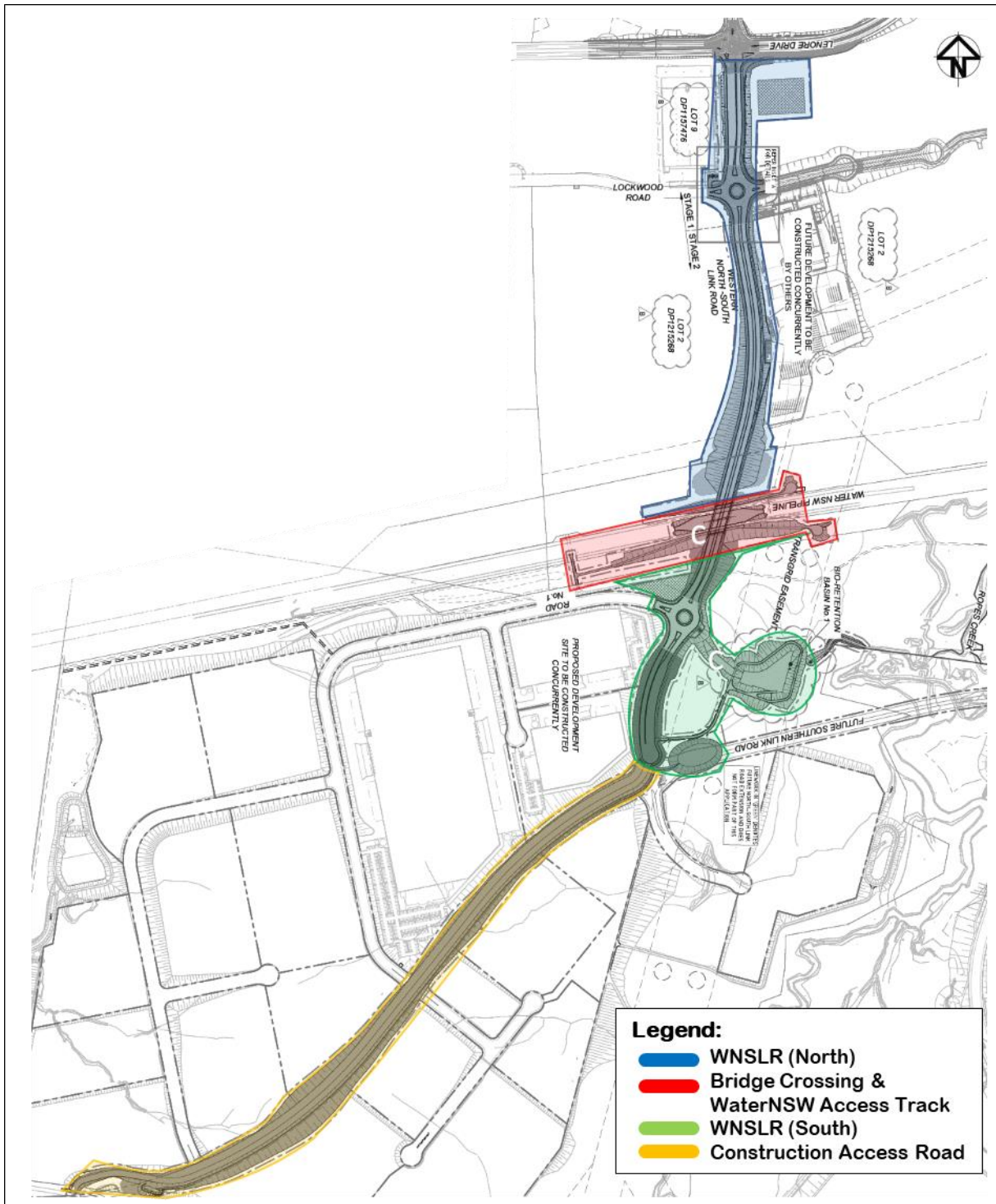


Figure 3: WNSLR Construction Zones

2 Existing Conditions

2.1 Existing Access

Access to the site is currently available via a number of gated accesses from Lenore Drive, Lockwood Road and Bakers Lane. The Water NSW pipeline is accessed via Old Wallgrove Road.



Figure 4: Existing Site Access - Lenore Dr & Lockwood Rd



Figure 5: Existing Site Access - Bakers Ln



Figure 6: Water NSW Pipeline Access – Old Wallgrove Road

It is noted that the Water NSW pipeline roads is subject to a 16-tonne load restriction, understood to be related to a weight restriction for a bridge at the mid-point. Notwithstanding, alternative arrangements will be implemented to facilitate heavy construction access to and from the works area.

2.2 Road Hierarchy

The road hierarchy in the locality is presented in **Figure 7** and summarised below for key roads.

2.2.1 M7 Motorway

The M7 motorway is a high capacity road link and provides a key north-south link, to the east of OWE, between the M2 motorway in the north and the M5 motorway to the south as part of the Sydney orbital road network. A major interchange between the M7 motorway and M4 Western motorway is located 2.5 km north of OWE, which connects the Sydney CBD and western Sydney suburbs. The motorway carries 4 trafficable lanes within a divided carriageway and is generally subject to a 100 km/h speed limit (within proximity of OWE).

2.2.2 Wallgrove Road

Wallgrove Road is an arterial road that runs in a north-south direction to the east of OWE and parallel to the M7 motorway. It provides a link between Elizabeth Drive in the south and the Great Western Highway in the north. Similar to the M7 motorway, Wallgrove Road connects to the M4 motorway approximately 2.5 kilometres to the north of OWE. The posted speed limit on the road within proximity

of the site is 70 km/h and the road carries approximately 30,000 vpd. Access to the M7 motorway is also provided from Wallgrove Road.

2.2.3 Lenore Drive

Lenore Drive is a recently upgraded sub-arterial route providing an east-west connection linking Old Wallgrove Road (OWR) to the east and Erskine Park Road to the west. It provides four lanes (two in each direction) within a divided carriageway with a shared path along the northern side of the road. It is subject to an 80 km/h speed zoning.

2.2.4 Old Wallgrove Road

OWR generally runs north-south in the vicinity of the site before turning to provide an east-west connection to Wallgrove Road. It forms part of an RMS Main Road (MR 629) route between Lenore Drive and Wallgrove Road. To the south of Lenore Drive, it functions as a local collector road.

2.2.5 Mamre Road

Mamre Road generally runs in a north-south direction to the west of the work area. It is a classified road and subject to an 80 km/h speed limit.

2.2.6 Bakers Lane

Bakers Lane is a local road that connects to Mamre Road. Surrounding land-uses include schools and rural residential properties. A signalised intersection is provided at Mamre Road providing access to the wider road network.

2.2.7 Aldington Road

Aldington Road is a local road that connects to Bakers Lane in the north, and Abbotts Road to the south. Surrounding land-uses include schools and rural residential properties. It is a sealed two lane, two road with no kerbs and gutters.

2.2.8 Abbotts Road

Abbotts Road is a local road that connects to Mamre Road via an unsignalised T-intersection. Surrounding land-uses include rural residential properties. It is a sealed two lane, two road with no kerbs and gutters.

2.3 Public Transport Services

As shown in **Figure 8**, bus services operate along Lenore Drive. Accordingly, any works affecting traffic conditions along Lenore Drive shall require advanced notification to local bus operators and TfNSW.

2.4 Active Transport Connections

A Shared Path (cyclists and pedestrians) is provided along the northern side of Lenore Drive and western side of Old Wallgrove Road, providing connections to the regional pedestrian and cycle networks.

No footpaths are provided on Bakers Lane in the vicinity of the proposed construction site access locations. There is a footpath on the western side of Old Wallgrove Road in the vicinity of the Water NSW access gate.

Footpaths and cycle routes do not carry high volumes of pedestrians or cyclists. Notwithstanding, any TCP shall maintain a suitable level of access past work areas for these users at all times.

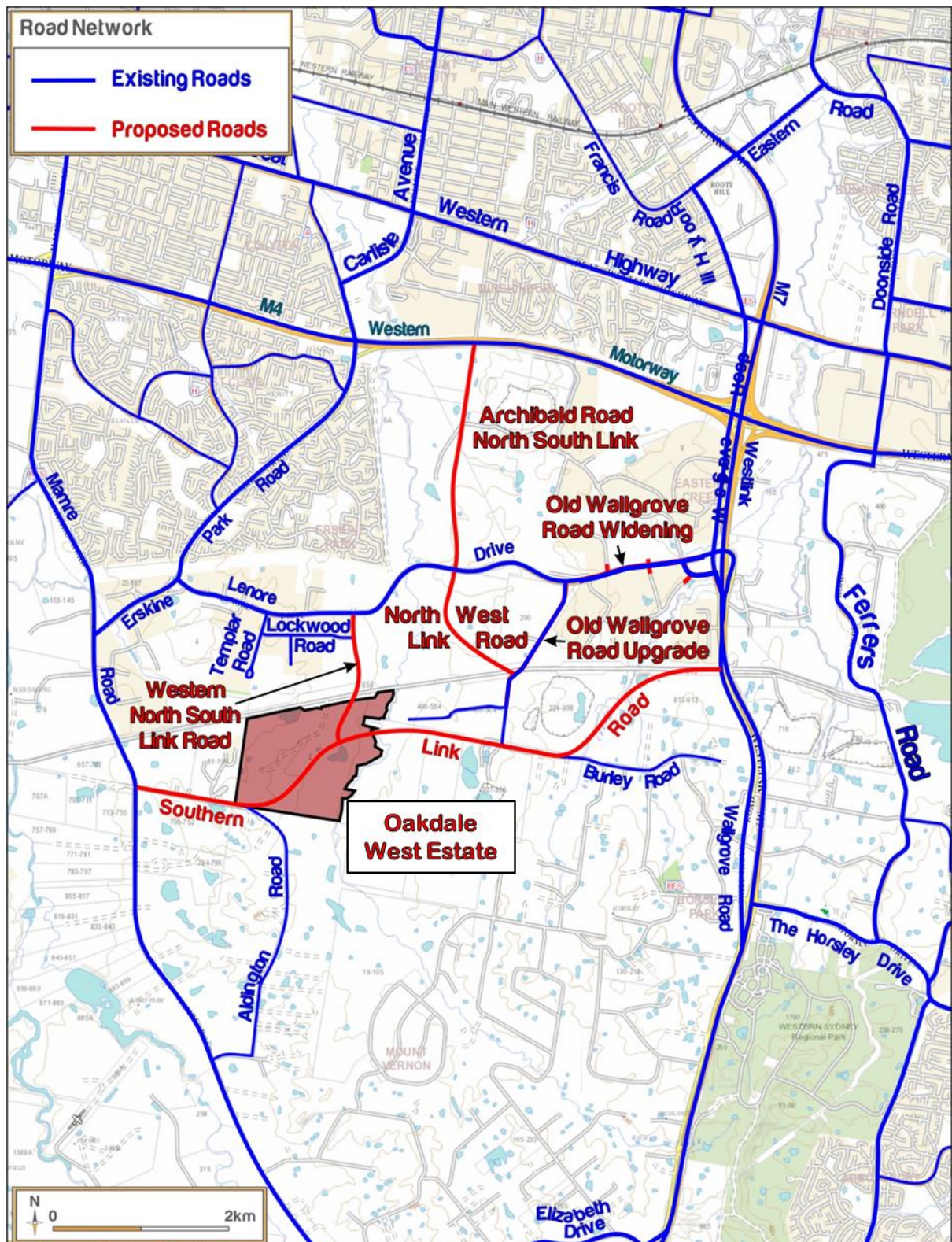


Figure 7: Road Hierarchy

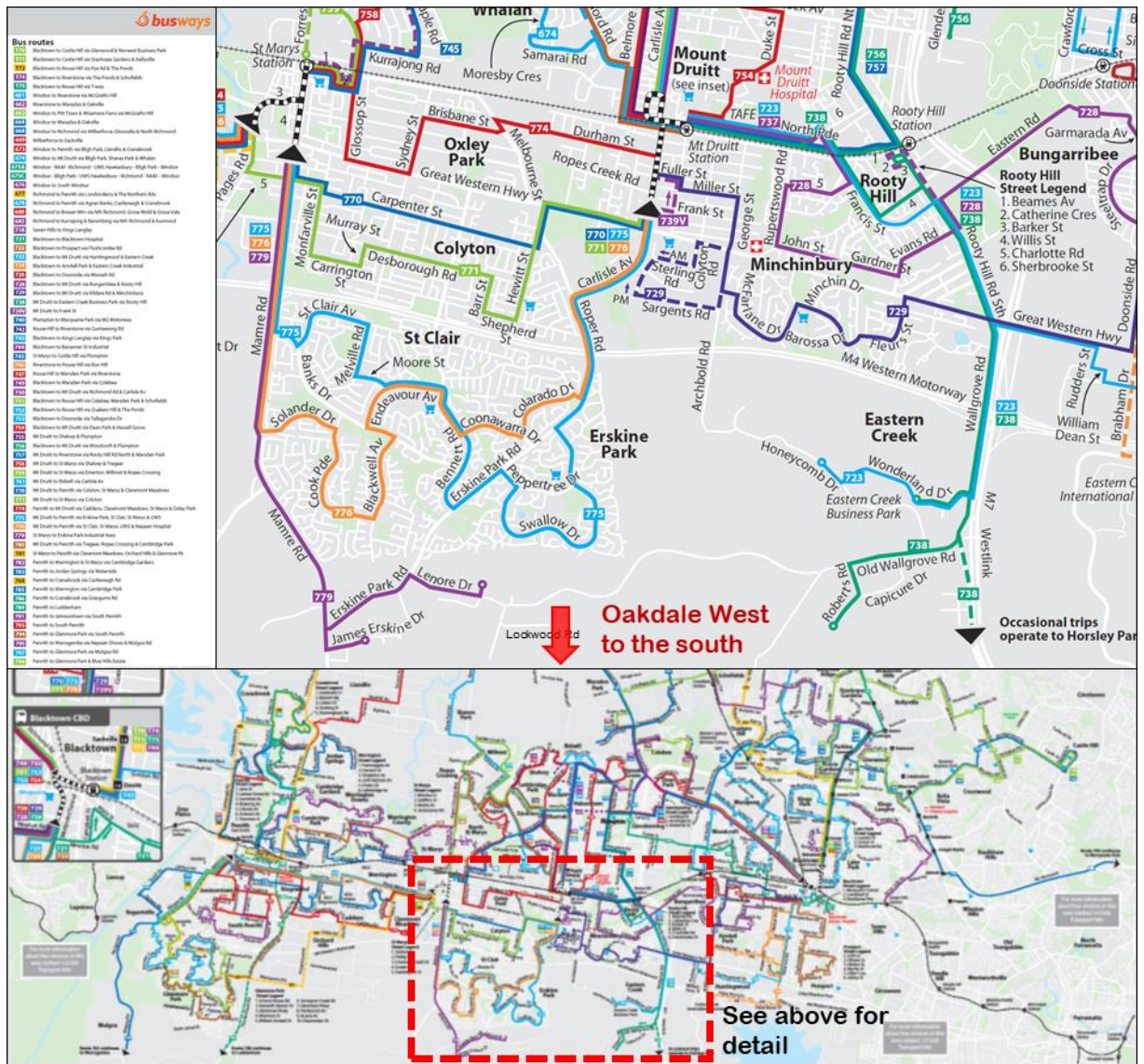


Figure 8: Public Transport Connections

3 Management Plan

3.1 Traffic Movement Restrictions

3.1.1 Background

The traffic report (Ason Group Ref: 0129r01v3) supporting the Oakdale West Estate submission, outlined the following relevant figures with regard to future operational traffic volumes associated with the Oakdale West Estate:

- Modelled 942 veh/h (movements, in & out combined)
- Projected 777 veh/h (movements, in & out combined)

3.1.2 Current Construction Traffic Estimates

It is projected that construction of WNSLR may involve up to 696 truck movements (1 truck in + 1 truck out = 2 movements) per day associated with inbound and outbound deliveries, with reduced numbers during the latter stages of the works.

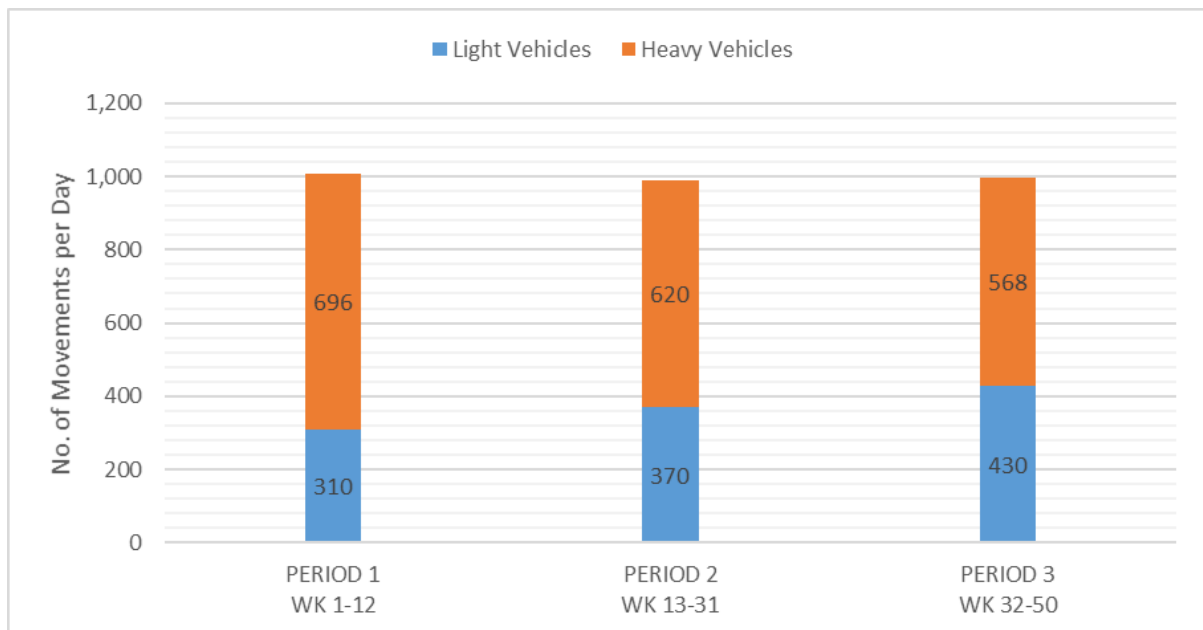


Figure 9: Daily Construction Vehicle Movements

These movements shall be spread throughout the day and relate to the combined vehicle movements associated with the works. A breakdown of typical peak movements for each work area is provided in **Appendix A**.

3.1.3 Water NSW Pipeline

Access to the service road is restricted and requires Water NSW approval. Conditional approval has been granted to Robson (and included within **Appendix E**). The approval outlines the following;

- Once the construction works are completed, the access on from Old Wallgrove Road shall be reinstated to the contractor.
- Each access gate to the WaterNSW corridor is to be locked at all times, unless manned by a gate keeper.
- The contractor is to provide and install daisy-chain padlocks at each access to the WaterNSW Corridor that is to be used during construction. At a minimum, it is expected that the Old Wallgrove Road access shall be padlocked.
- All locks to be used are to be registered (and therefore the keys cannot be copied) and a register of these keys is to be kept up to date. If a key is lost, it is the responsibility of Robson to replace all locks and keys,
- WaterNSW shall be notified at least 48 hours in advance of any amended access restrictions being introduced,
- WaterNSW shall be provided with regular updates on the construction program,
- When access through the worksite within the WaterNSW corridor is not possible (e.g. during temporary crane works and bulk earthworks), the following must be undertaken;
 - “No Through Road” signage is to be installed at OWR entrance, and
 - Temporary barriers with additional signage are to be installed either side of work zone to prevent access into work zone.
- An access track has been permitted for travel between sides of the Pipeline. The location and intent of this access track has been outlined within **Figure 10**. Robson must;
 - Install minimum height clearance rails on either side of the pipeline,
 - Not remove the access track so that WaterNSW may use the track post construction,
 - Light vehicle use is to be restricted for the access track under the pipeline and over the encasement,
 - Reinstatement of access track(s) if any damages are to occur, and
 - Retention of any gates temporarily removed.

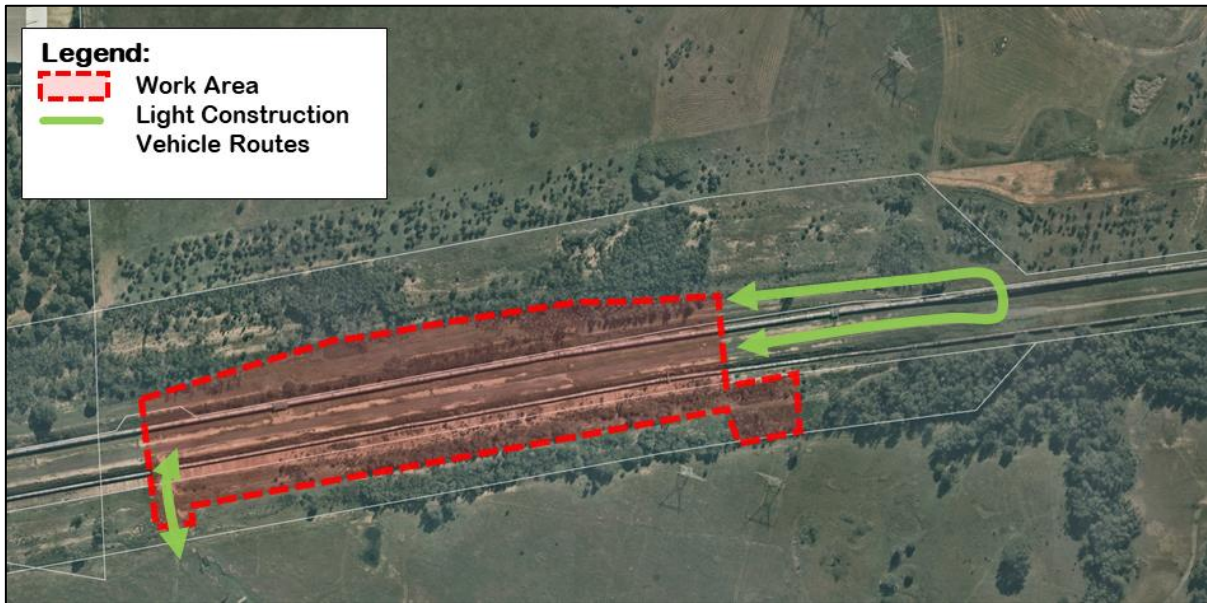


Figure 10: Light Vehicle Crossing Location

3.1.4 TransGrid Easement

A TransGrid easement runs along the eastern side of the Work Area which is subject to a number of restrictions. Importantly, no vehicle circulation is permitted within 5 metres of any transmission structure or guy-wires. Accordingly, all endeavours shall be undertaken to limit vehicular movements with the easement areas, wherever practicable.

3.1.5 Measures to Manage Construction Traffic in Bakers Lane During School Zone Periods

It is noted that the conditions of consent require detail of specific measures to manage construction traffic to avoid school drop-off and pick up times (Monday to Friday 8:00 – 9:30AM and 2.30 – 4:00PM, and Higher School Certificate exam periods). In this regard, the following measures shall be implemented to limit (as far as practicable) Heavy Vehicles from using Bakers Lane during the above hours:

- All suppliers/haulage contractors to have Vehicle Movement Plans issued at supply agreement stage
- When placing all orders, access restrictions shall be notified to dispatch and included on delivery docket, where possible
- Deliveries scheduled for outside restricted times,
- Signage installed on approach to Bakers Lane (primary route) and alternative route notifying delivery drivers of time limitations

- During bulk importation periods, gate person tracking loads in/out and communicating and monitoring access/egress routes accordingly
- Any vehicles found to be in breach to undergo driver induction on the spot and their manager/dispatch advised; repeat offenders to be prevented from returning to site
- Heavy vehicle breaches during school zones be captured and reported to DPIE.

3.2 Other General Requirements

3.2.1 Driver Code of Conduct

All drivers shall adhere to the Driver Code of Conduct, outlined in Section 4.

3.2.2 Loading & Materials Handling

All deliveries and materials handling is to occur on-site at all times.

3.2.3 Work Zone Requirements

An on-street Works Zone is proposed for the use of hydrant fill points on Bakers Lane by Contractor water carts. The locations will be confirmed (and approved) with the PCC prior to any filling.

A separate application to Council will therefore be required in the event that any special or discreet work activities do require the use of kerbside parking for the purposes of a Works Zone.

3.2.4 Pedestrian Management

Man-proof fencing shall be provided along all site frontages accessible by the public to prevent unwanted pedestrian access. Careful consideration for pedestrian protection shall be included within relevant TCP, as outlined below.

3.2.5 Cyclist Management

Man-proof fencing shall be provided along all site frontages accessible by the public to prevent unwanted cyclist access. Careful consideration for cyclist protection shall be included within relevant TCP, as outlined below.

3.2.6 Traffic Control Plans

Any Traffic Control Plans (TCPs) shall be prepared by an accredited person, in accordance with the RMS *Traffic Control at Worksites Manual* and AS1742.3.

All TCPs involving signage or impacts to public roads shall be approved by RMS Traffic Management Centre, prior to the works for which they relate. These TCPs shall be updated to respond to any changes to prevailing traffic conditions throughout the life of the works.

Furthermore, A copy of the TCP will be provided to WaterNSW once approved.

3.3 Phase 1 - WNSLR (North Section)

3.3.1 Key Stage Details Summary

Table 2: Stage Summary - WNSLR North Section

Criteria	Response
Description of Key Activities	WSNLR / Lenore Drive intersection works. General road construction and associated earthworks and infrastructure along the northern section of the WNSLR, between Lenore Dr and Water NSW Pipeline
Max. Vehicle Size	Possible B-Doubles vehicle Floats with large plant. Oversize vehicles for girder deliveries to occur at night and under special permit addressed separately to this CTMP.
Vehicle Movement Frequency	180 – 260 Light Vehicle movements per day 220 – 250 Heavy Vehicle movements per day
Truck Access Requirements	Primary access via Lockwood Road, to facilitate all movement access to Lenore Drive. Left-in, left-out access to Lenore Drive.
Vehicle access / egress in a forward direction (Yes / No)	Y – upon written approval by the Planning Secretary
Contractor Parking	Refer Figure 12 - Builder shall nominate contractor parking zones, clear of truck manoeuvring areas.
Pedestrian Control	Man-proof site boundary fencing
Public Transport Services Affected	Nil
Road Occupancy Requirements (if yes, provide further details)	Yes – Phase 1 involves tie in works within Lenore Drive
Lane or Footpath Closures (if yes, provide further details)	Yes – kerbside lane occupancy within Lenore Drive may be required for a short duration.
Traffic Control Plan	Site-specific TCP to be submitted to RMS TMC for approval, prior to commencement of those works. Traffic management signage shall be provided to mitigate issues associated with the temporary removal of the existing cul-de-sac turning head.

This stage of works should be undertaken in consultation with Fitzpatrick — as developer for adjoining land parcels — so that necessary works and associated traffic management thereof can be coordinated.

3.3.2 Truck Movements & Contractor Parking

Relevant truck routes are presented below.

In the event that vehicles were required to use a layover prior to arrival to site, it is expected that the vehicles shall laydown within Distribution Drive and Milner Avenue before arriving to site in order to avoid any on-street queuing. **Figure 11** identifies the proposed location in reference to the Site.

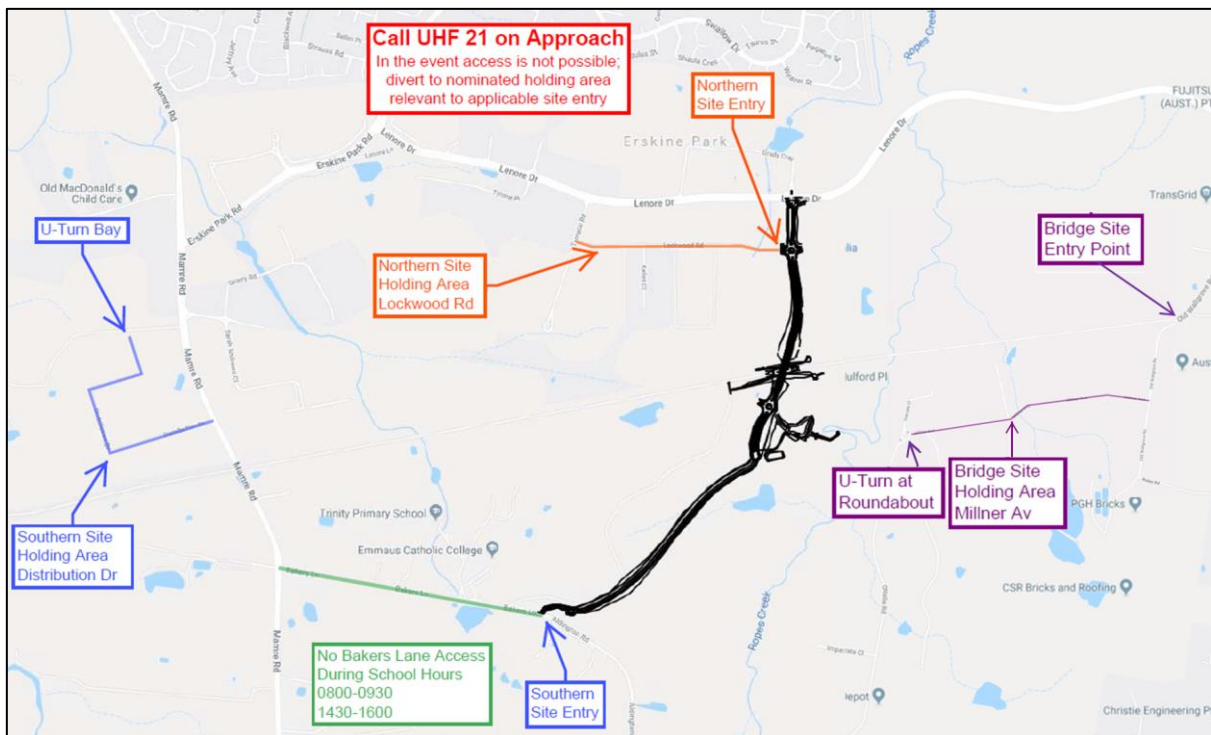


Figure 11: Truck Layover Locations

Interim line-marking and other intersection control would be required at the interim intersection of Lockwood Road / WNSLR and the Work Area to the south.

The implementation of each access route shall be done so in accordance with any and all conditions of consent received by the RMS.

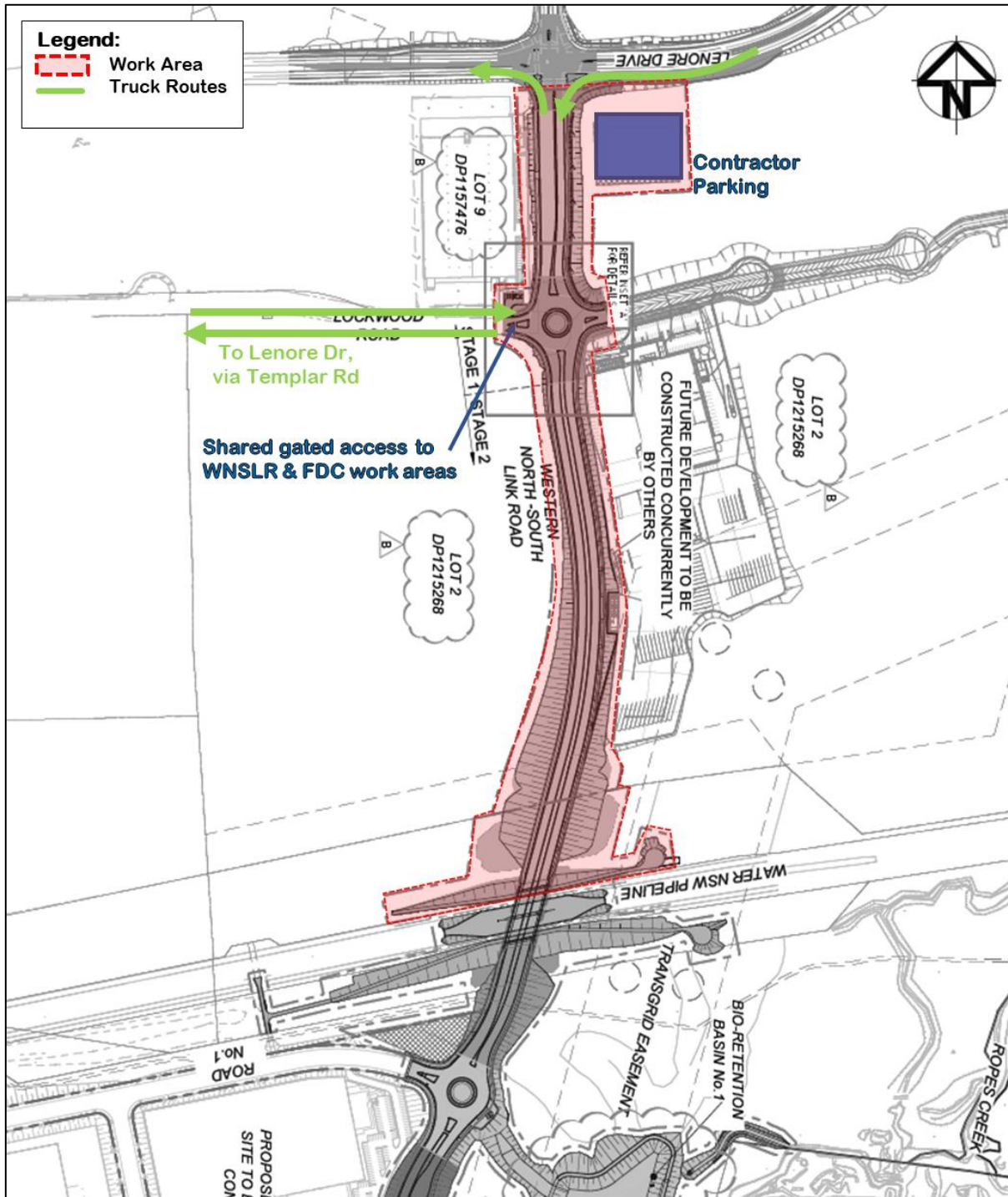


Figure 12: Truck Routes - Phase 1 WNSLR (North) Works

3.3.3 Traffic Control Plans

Having regard for the anticipated truck movements exceeding 20 movements per day, it is expected that signage (e.g. “Trucks Turning”) may be required at the site access points to advise other road users of changed traffic conditions. In this regard, it is expected that site-specific versions of the standard TCP 195 would be implemented by the Contractor.

In addition, site-specific versions of standard TCP 93 will be required for any works within Lenore Drive where the kerbside lane is obstructed or insufficient clearances to passing traffic cannot be maintained.

Further site-specific TCPs shall be developed and submitted to TMC for approval, as required to reflect specific work activities and/or changes to road conditions. A copy of the TCP will be provided to WaterNSW once approved

3.4 Phase 2 - Bridge Crossing

3.4.1 Key Stage Details Summary

Table 3: Stage Summary – Bridge Crossing

Criteria	Response
Description of Key Activities	Construction of the Water NSW pipeline bridge crossing. Works. Noting the limitation from the pipeline, works will be undertaken from 3 areas.
Max. Vehicle Size	Float with large plants 450 tonne cranes.
Vehicle Movement Frequency	40-50 Light Vehicle movements per day 150 – 184 Heavy Vehicle movements per day
Truck Access Requirements	Varies - see below. Northern section to/from Lenore Dr and via Lockwood Rd. Central section entry from Old Wallgrove Rd, under a right-in-left-out arrangement and with an approved Traffic Control Plan (to be submitted by the Contractor) Southern section to/from Mamre Rd, via Bakers Ln.
Vehicle access / egress in a forward direction (Yes / No)	Yes (oversize vehicles – i.e. for girder deliveries – subject to separate permit / requirements)
Contractor Parking	Varies in response to work area
Pedestrian Control	Man-proof site boundary fencing
Public Transport Services Affected	Nil
Road Occupancy Requirements (if yes, provide further details)	No
Lane or Footpath Closures (if yes, provide further details)	No (NOTE: Contractor must maintain access for Water NSW emergency maintenance vehicles at all times.)
Traffic Control Plan	Standard TCP 195 (Trucks Turning) at site access points.

3.4.2 Truck Movements

Relevant truck routes to be adhered to during this phase are outlined below. Temporary haulage routes within the site itself shall be determined by the Contractor and documented through Vehicle Movement Plans. Access routes to the northern section of Phase 2 should occur to the west of the WNSLR to avoid unnecessary movements within the TransGrid easement.

Access to/from Old Wallgrove Road to the WaterNSW access Road is to be restricted to right-in left-out movements for general operations (outlined within **Figure 13**). Access to and from the site from Old Wallgrove Road will be undertaken by a right-in-left-out movement and is outlined within **Figure 14**. The implementation of this access route shall be done so in accordance with any and all conditions of consent received by the RMS.

Special circumstances may require oversized or overweight deliveries to be permitted (under escort) to turn right-in or right-out of the central access, however site-specific TCP's would be prepared for the above works prior to being undertaken.

It is anticipated that materials will be delivered from all 3 entrances at various time throughout this phase of the works. It is anticipated that relevant materials for the central sections will be delivered within the Water NSW access road and then lifted into place from cranes positioned in the Water NSW corridor. A clear path for Water NSW emergency maintenance vehicles shall be maintained at all times. Notwithstanding, any use of the Water NSW service road shall be coordinated such that regular pipeline maintenance is not conducted when large deliveries to the central area are required.

Furthermore, based on the estimated construction programme, it is expected that the total vehicle movements across the entire project (approximately 50 weeks) for the bridge works are outlined below;

- Girder Delivery: 60 movements
- Plant Floats: 60 movements
- Cranes: 120 movements
- Haulage Vehicles: 4,470 movements
- Light Vehicles: 960 movements
- **Total: 5,670 movements.**

Noting that up to 184 vehicle movement per day (92 vehicles per day) will utilise this access across an 11-hour work day, which equates to approximately 17 vehicle movements (in and out) an hour.

The above breakdown estimates that there shall be 1 additional vehicle every 3-4 minutes. Notwithstanding it is understood that vehicles do not usually arrive to site at regular intervals, therefore

a delivery management plan shall be developed to ensure that the movements are maintained below the threshold.

Having regard for the above, the peak construction traffic is considered acceptable, and as such, will be unlikely to have a material impact on the performance of the surrounding road network.

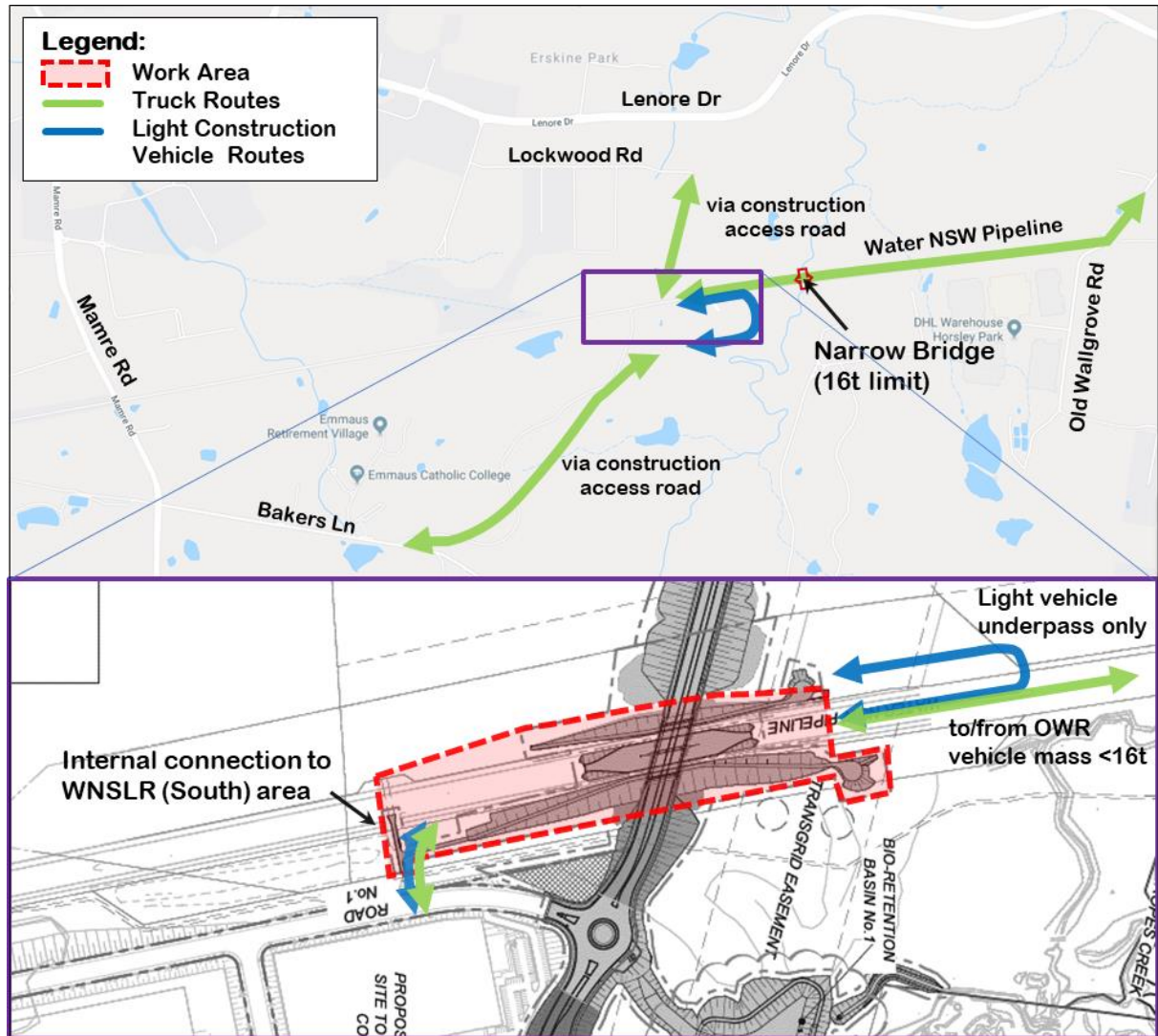


Figure 13: Crossing Locations and Routes - Phase 2 (Bridge Crossing Works)

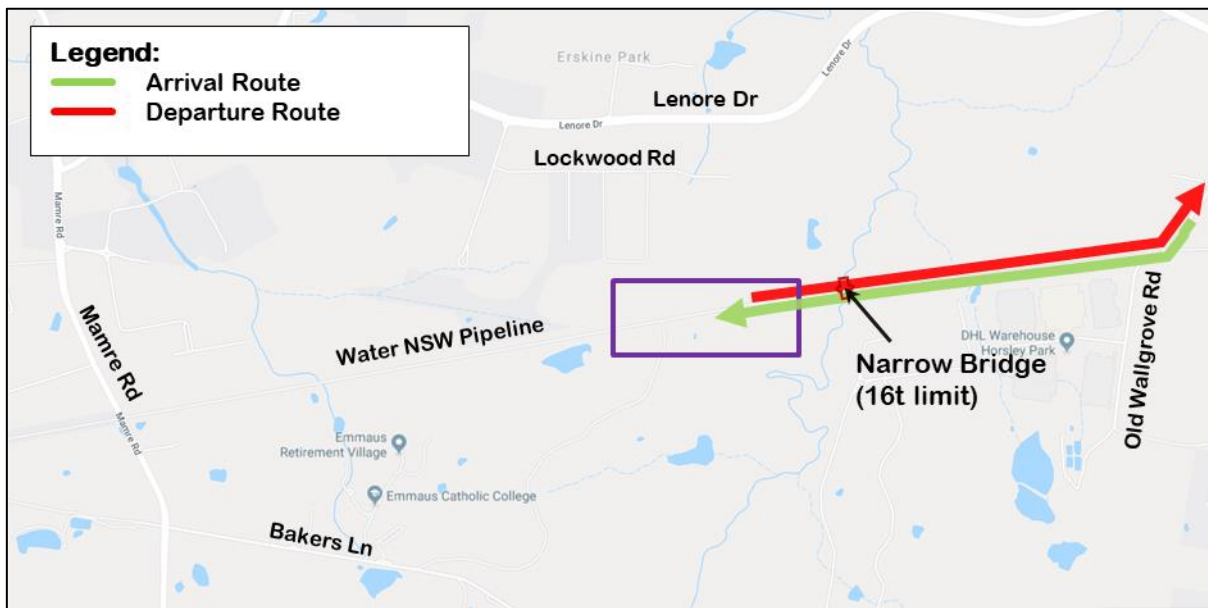


Figure 14: Right-in-left-out Access at Old Wallgrove Road

3.4.3 Contractor Parking

Temporary contractor parking areas will be provided within the work area or on either side of the Water NSW pipeline. The location will be flexible to respond to changing work conditions / areas and used by regular personnel. Irregular visitors will be encouraged to use the primary contractor parking areas within either North or South work areas.

3.4.4 Traffic Control Plan

The works do not directly affect public roads. However, some signage (e.g. “Trucks Turning”) may be required at the site access points to advise other road users of changed traffic conditions. In this regard, it is expected that site-specific versions of the standard TCP 195 would be implemented by the Contractor.

Access to the Water NSW pipeline from Wallgrove Road will require a site-specific Traffic Control Plan to be developed by the Contractor and approved by the relevant Roads Authority. This is expected to include relevant Trucks Turning and speed reduction signage to safely manage truck entry and exit movements.

A copy of the TCP will be provided to WaterNSW once approved

3.5 Phase 3 - WNSLR (Southern Section)

Table 4: Stage Summary – WNSLR South

Criteria	Response
Description of Key Activities	Construction of WNSLR, south of the Water NSW Pipeline.
Max. Vehicle Size	Floats with large plants + Truck & Dog Trailer
Vehicle Movement Frequency	120 -160 Light Vehicle movements per day 260 – 290 Heavy Vehicle movements per day
Truck Access Requirements	Varies - see below. In the short term, access will be to/from Mamre Rd, via Bakers Ln. Upon completion of the Phase 2 works, additional access shall be to Lenore Drive, via the WNSLR.
Vehicle access / egress in a forward direction (Yes / No)	Yes
Contractor Parking	On-site compound
Pedestrian Control	Man-proof site boundary fencing
Public Transport Services Affected	Nil
Road Occupancy Requirements (if yes, provide further details)	Yes – construction access road tie works to Bakers Lane
Lane or Footpath Closures (if yes, provide further details)	Yes – construction access road tie works to Bakers Lane.
Traffic Control Plan	Standard TCP 195 (Trucks Turning) at site access points. Site-specific version of standard TCP 42 or 84 to be implemented during Bakers Lane interface works. A copy of the TCP will be provided to WaterNSW once approved

3.5.1 Truck Movements & Contractor Parking

Relevant truck routes to be adhered to during this Phase are outlined below. Temporary haulage routes within the site itself shall be determined by the Contractor and documented through Vehicle Movement Plans.

The implementation of each access route shall be done so in accordance with any and all conditions of consent received by the RMS. It is expected that a schedule for deliveries of materials and goods will be established prior to that day, with Traffic Controllers maintaining radio contact with construction vehicles at all times. Thus, at no stage shall queueing occur on the public road network.

In the event that vehicles were required to use a layover prior to arrival to site, it is expected that the contractor shall identify an appropriate location for all heavy vehicles to utilise prior to arrival to site.

3.5.2 Traffic Control Plan

The works do not directly affect public roads. However, some signage (e.g. “Trucks Turning”) may be required at the site access points to advise other road users of changed traffic conditions. In this regard, it is expected that site-specific versions of the standard TCP 195 would be implemented by the Contractor. TCPs would also be supplemented with additional wayfinding signage to assist adherence to the above access restriction.

A copy of the TCP will be provided to WaterNSW once approved

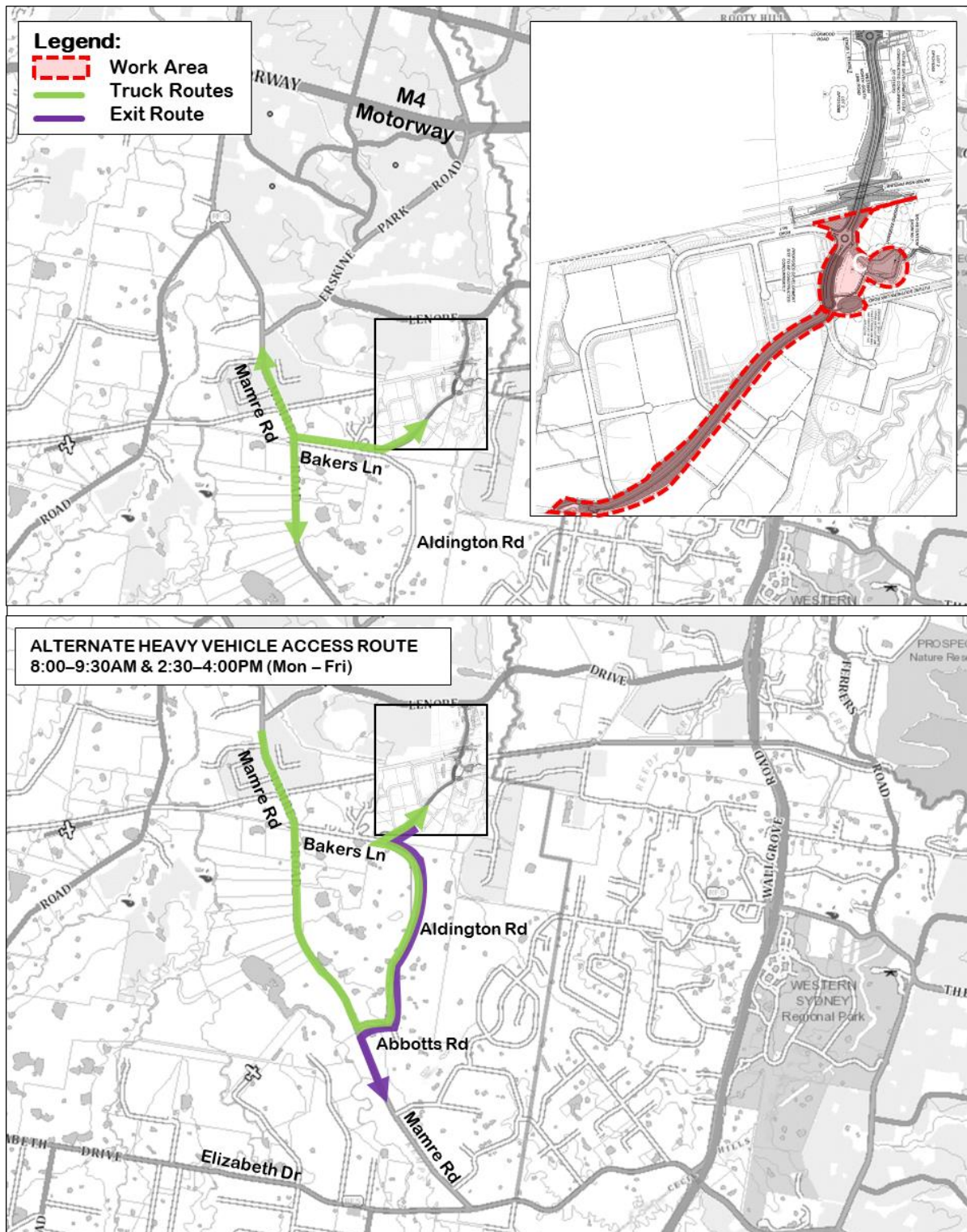


Figure 15: Truck Routes - Phase 3 (WNSLR South)

3.6 Cumulative Impacts

The traffic report (Ason Group Ref: 0129I04v2) considers the cumulative impacts of the two known construction works within the area. The first being the works within this report, and the other the Western North South Link Road - State Significant Development. It is intended that the WNSLR provide a connection between Lenore Drive and the future Southern Link Road (SLR).

The anticipated vehicle movements generated by the construction of the OWE and WNSLR have been estimated having consideration of the likely requirements for construction staff, plant, equipment and haulage. Having regard for the above and the anticipated construction schedule, the estimated traffic volumes and accesses are as follows:

Table 5: Consolidated Daily Construction Traffic Volumes

Access Route	Access	Vehicle Type	Period			
			WK 1-12	WK 13-31	WK 32-50	WK 50+
Bakers	OWE	LV	200	200	200	-
		HV	200	200	200	-
	Bridge	LV	-	-	-	-
		HV	-	-	-	-
	WNSLR	LV	120	150	160	-
		HV	290	280	260	-
Bridge	OWE	LV	-	-	-	-
		HV	-	-	-	-
	Bridge	LV	10	10	10	-
		HV	156	120	88	-
	WNSLR	LV	-	-	-	-
		HV	-	-	-	-
Lenore	OWE	LV	-	-	-	200
		HV	-	-	-	1,200
	Bridge	LV	-	-	-	-
		HV	-	-	-	-
	WNSLR	LV	-	-	-	-
		HV	-	-	-	-

Access Route	Access	Vehicle Type	Period			
			WK 1-12	WK 13-31	WK 32-50	WK 50+
	WNSLR	LV	180	210	260	-
		HV	250	220	220	-
		Light Vehicle	510	570	630	200
		Heavy Vehicle	896	820	768	1,200
Total (Combined)		TOTAL	1,406	1,390	1,398	1,400

Having regard for the above and for approved daily volumes outlined within Section 3.1.1, the approved threshold and will not be exceeded and therefore will not result in any unacceptable impacts on the surrounding road network.

Subsequent to the above, it is currently unknown if there are any further construction projects underway and/or planned throughout the duration of the project. In the event that any other additional construction works are to be undertaken, consultation with both the OWE and WNSLR projects will be undertaken.

The additional cumulative impacts would be determined on the timing and type of activity. Any impacts would be site specific in nature, so are difficult to define in any detail at this stage, however key issues would predominately be associated with construction traffic and noise.

4 Drivers Code of Conduct

Safe Driving Policy for WNSLR construction activities.

4.1 Objectives of the Drivers Code of conduct

- To minimise the impact of earthworks and construction on the local and regional road network;
- Minimise conflict with other road users;
- Minimise road traffic noise; and
- Ensure truck drivers use project approved routes only

4.2 Code of Conduct

The code of conduct requires that while driving any vehicle for work-related purposes. Drivers are to be issued with a copy of the Drivers Code of Conduct, and must comply with all of the following:

- Demonstrate safe driving and road safety activities
- Abide by traffic, road and environmental legislations
- Follow site signage and instructions
- Drivers must only enter and exit the site via the approved entry and exit points and travel routes.

The below activities in any vehicles will be considered as a breach of conduct and will result in removal from site:

- Reckless or dangerous driving causing injury or death
- Driving whilst disqualified or not correctly licensed
- Drinking or being under the influence of drugs while driving
- Failing to stop after an incident
- Loss of demerit points leading to suspension of licence
- Any actions that warrant the suspension of a licence
- Exceeding the speed limit in place on any permanent or temporary roads

4.3 Driver Responsibilities

All Drivers on site must:

- Be responsible and accountable for their actions when operating a company vehicle or driving for the purposes of work.
- Display the highest level of professional conduct when driving a vehicle at all times.
- Ensure they have a current driver licence for the class of vehicle they are driving, and this licence is to be carried at all times
- Immediately notify their supervisor or manager if their drivers' licence has been suspended, cancelled, or has had limitations applied.
- Comply with all traffic and road legislation when driving.
- Assess hazards while driving.
- Undertake daily pre-start checks of oil, tyre pressures, radiator and battery levels of company vehicles they regularly used.
- Drive within the legal speed limits, including driving to the conditions.
- Not drive outside of the approved heavy vehicle routes. All drivers must obey weight, length and height restrictions imposed by the National Vehicle Regulator, and other Government agencies. Heavy Vehicles shall adhere to the routes outlined in Section 3.
- Be cognisant of the noise and emissions requirements imposed within the EIS, and in a broader sense, the NSW/ Australian Road Rules. Works must be constructed with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline.
- Do not queue on public roads unless a prior approval has been sought.
- Be aware that at no time may a tracked plant be permitted or required on a paved road.
- Never drive under the influence of alcohol or drugs, including prescription and over the counter medication if they cause drowsiness – to do so will merit disciplinary measures.
- All drivers to report to their supervisor if they have been prescribed medication prior to the start of work.
- Wear a safety seat belt at all times when in the vehicle.
- Avoid distraction when driving – the driver will adjust car stereos/mirrors etc. before setting off, or pull over safely to do so.
- Report ALL near-misses, crashes and scrapes to their manager,

- Report infringements to a manager at the earliest opportunity.
- Report vehicle defects to a manager prior to the next use of the vehicle.
- Follow the approved site access/egress routes only.
- Follow speed limits as imposed within the estate.
- Keep loads covered at all times.

4.4 The Site Team Responsibilities

The Contractor is responsible to take all steps necessary to ensure company vehicles are as safe as possible and will not require staff to drive under conditions that are unsafe.

This will be achieved by undertaking the following:

- Ensuring all vehicles are well maintained and that the equipment enhances driver, operator and passenger safety by way of:
 - Pre-commencement checks for all new plant arriving on-site and prior to undertaking any work.
 - Daily prestart inspections for all plant, vehicles and equipment currently on-site.
 - All construction plant must be fitted with a flashing light, fire extinguisher and reverse alarms (or squawkers).
 - Ensure all operators onsite have a current verification of competency (VOC) for their current driver's licence of the appropriate class.
 - Ensure maintenance requirements are met and recorded.
- Identify driver training needs and arranging appropriate training or re-training. This may include providing the below:
 - Operator VOC assessment as part of all inductions.
 - Regular Toolbox discussions on safety features, managing fatigue, approved heavy routes, driver responsibility and drink-driving
- Encouraging Safe Driving behaviour by:
 - Ensuring the subcontractor is informed if their staff become unlicensed
 - Not covering or reimbursing staff speeding or other infringement notices
 - Ensuring Legal use of mobile phones in vehicles while driving only and that illegal use is not undertaken.
- Encouraging better fuel efficiency by:

- Use of other transport modes or remote conferencing, whenever practical.
- Providing training on, and circulating information about, travel planning and efficient driving habits.

4.5 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
 - 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.
 - If you damage property other than your own.
- As soon as reasonably practical, report all details gathered to your manager.

4.6 Environmental Procedures.

A range of measures — including those detailed in the Environmental and Sedimentation Control Plan (ESCP); Appendix F of the Erosion and Sediment Control Plan — shall be implemented to ensure the following;

- No dirt or debris from the construction vehicles is tracked on to the public road network;
- Reduce the impacts to sensitive receivers, including, where practicable, starting noisy equipment away from sensitive receivers and implementing respite periods;

- Watering of dusty activities will be undertaken, or activities temporarily halted and then resumed once weather conditions have improved;
- Containment measures for spillages will be provided at appropriate locations and in close proximity to staff car park areas, dangerous goods stores areas and main Project work areas;
- All vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria, and
- Keep an accurate record which includes the range of measures undertaken to reduce environmental impacts.

5 Transport Impact Assessment

5.1 Construction Traffic Generation

As discussed above, the construction works are expected to generate up to 1,006 vehicle movements per day. Vehicle movements will be spread throughout the day and — particularly in the case of access to the southern work area — avoid peak school drop-off periods. Reference is made to the detailed breakdown of vehicle movements included in Appendix A which details projected movements during a number of periods:

- Pre-School Zone (7:00 – 8:00AM)
- Morning School Zone (8:00 – 9:30AM)
- Between School Zones (9:30AM – 2:30PM)
- Afternoon School Zone (2:30 – 4:00PM)
- Post-School Zones (4:00 – 6:00PM)

The peak for each of these periods varies for each work area during the life of the construction program.

In relation to WNSLR (South) work area, the works will generate peak hourly traffic before and after the School Zone periods. Noting the 1.5-hour School Zone period for which the figures relate, it is estimated that construction could generate up to 40 vehicles per hour, of which 30 relate to Heavy Vehicle movements.

The critical period for the WNSLR (North) work area relates to the standard on-street peak periods which may therefore coincide with the “Pre-School Zone” and Post-School Zone” periods. Noting that construction traffic is to avoid access to and from Bakers Lane within the school zones, the projected figures suggest the following peak hourly traffic generation:

- AM peak 187 veh/hr (187 movements over 1-hour)
 - Light Vehicles 72 in, 0 out
 - Heavy Vehicles 65 in, 55 out
- PM peak 108 veh/hr (216 movements over 2-hours)
 - Light Vehicles 5 in, 41 out
 - Heavy Vehicles 31 in, 31 out

All deliveries via Bakers Lane will be undertaken outside of School zone hours. However, if access is necessary during these times, vehicles will be directed to use Aldington Road to access Mamre Road and thus not pass directly past the neighbouring schools during these periods.

5.2 Impacts on Surrounding Network

Recent modelling the Mamre Road / Bakers Lane intersection suggests that existing peak volumes, particularly during school peaks, exceeds capacity (Level of Service F). Notwithstanding, the conditions of consent have specifically requested restricting the construction traffic to avoid school drop off and pick up times (Monday to Friday 8:00 – 9.30 AM and 2.30 – 4.00PM).

The other key intersection of Lenore Drive / Templar Road has been modelled using SIDRA Intersection and demonstrated to operate satisfactorily under existing conditions, with minimal changes to intersection performance as a result of the peak hourly traffic movements anticipated. A copy of relevant SIDRA analysis is included in **Appendix C**; demonstrating a “good” performance with a Level of Service B under all scenarios. Furthermore, the impacts of construction traffic and the mitigating measures to be implemented are outlined below.

- **Construction Traffic in Bakers Lane:** Construction traffic will initially use Bakers Lane to access the work area. To ensure the impacts to residents and schools within the area is kept to a minimum, construction traffic will be restricted to access the site outside of school zone periods
- **Management of deliveries:** Construction vehicle access via Bakers Lane shall be restricted to outside school zones to the safety of all patrons arriving and departing school. Ancillary to school zone time restrictions, the Contractor will manage deliveries to shall ensure that constructions vehicles, particularly heavy vehicles, will be minimised during peak periods.
- **Safety During Construction:** Safety to motorists and pedestrians throughout the area will be maintained during construction through the preparation and execution of Traffic Control Plans (TCP's). A range of TCP's will be prepared for each access throughout construction, to identify all reasonably foreseeable hazards, assess the hazards, and manage the hazards as best possible by either eliminating or minimising the risks. TCP's shall be monitored, and updated accordingly throughout the project.
- **Reporting:** Reporting and monitoring of movements during key school periods is to be undertaken to ensure that drivers are adhering to restricted times, and to ensure that the approved traffic generation, and subsequent impacts on the road network, are in line with those approved.

In summary, based on the traffic numbers currently envisaged, the traffic impacts are considered acceptable.

6 Plan Administration

6.1 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. As a minimum, 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 TCP'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 undertaken to ensure all loads are entering and leaving site covered as outlined within this CTMP.

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.

6.2 Contingency Plan

A contingency plan shall be established by the Contractor and is to be included in the overarching CEMP. Notwithstanding, **Table 6** 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 6: Contingency Plan

Risk		Condition Green	Condition Amber	Condition Red
Construction Movements	Trigger	Construction traffic does not exceed the permissible volume and time constraints	Construction traffic just exceeds the permissible volume and time constraints	Construction traffic far exceeds the permissible volume and time constraints
	Response	No response required Continue monitoring program	<p>Review and investigate construction activities, and where appropriate, implement additional remediation measures such as:</p> <ul style="list-style-type: none"> - Temporary halting of activities and resuming when conditions have improved - Review CTMP and update where necessary - Provide additional training. 	<p>Review and investigate construction activities. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies. Where appropriate, implement additional remediation measures such as:</p> <ul style="list-style-type: none"> - Temporary halting of activities and resuming when conditions have improved - Stop all transportation into and out of the site. - Review CTMP and update where necessary. - Provide additional training.
Queuing	Trigger	No queuing identified	Queuing identified within site	Queuing identified on the public road
	Response	No response required Continue monitoring program	<p>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</p>	<p>Review and investigate construction activities. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies. Where appropriate, implement additional remediation measures such as:</p> <ul style="list-style-type: none"> - Temporary halting of activities and resuming when conditions have improved - Stop all transportation into and out of the site. - Review CTMP and update where necessary. <p>Provide additional training</p>

Risk		Condition Green	Condition Amber	Condition Red
Noise	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 Continue monitoring program.	Undertake all feasible and reasonable mitigation and management measures to minimise noise impacts.	Undertake all feasible and reasonable mitigation and management measures to ensure noise levels are below Highly Noise Affected criteria. If noise levels cannot be kept below applicable limits, then a different construction method or equipment must be utilised.
Traffic Control Plans	Trigger	No observable issues	Minor inconsistencies with TCP to onsite operations	Near miss or incident occurring regardless of / as a result of the TCP being implemented
	Response	No response required Continue monitoring TCPs.	Traffic Controller to amend TCP 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 TCP to ensure that the safety of all workers, students and civilians are catered for.
Dust	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 Continue monitoring program	<p>Review and investigate construction activities and respective control measures, where appropriate. Implement additional remedial measures, such as:</p> <ul style="list-style-type: none"> - Deployment of additional water sprays - Relocation or modification of dust-generating sources - Check condition of vibrating grids to ensure they are functioning correctly - Temporary halting of activities and resuming when conditions have improved 	<p>Review and investigate construction activities and respective control measures. If it is concluded that construction activities were directly responsible for the exceedance, submit an incident report to government agencies.</p> <p>Implement relevant responses and undertake immediate review to avoid such occurrence in future.</p>

It is therefore proposed to incorporate the above items within the communications strategy. The contingency plan outlines the most effective methods to ensure that each item identified within the Monitoring Program is adhered to, resulting in the impacts to the wider community being minimised.

It also represents the efforts undertaken to continually improve CTMP and ensure that the process being utilised are indeed best practice.

6.3 Communications Strategy

A communications strategy shall be established by the Contractor and is included in the overarching CEMP (refer to the community consultation strategy prepared by SLR). The contractor is to notify the community liaison representative when traffic is expected to exceed the parameters set within "Condition Green" of Table 6. Notwithstanding, Table 7 outlines an indicative communication strategy to be undertaken by the contractor to ensure that adequate communication with key stakeholders have been met.

Table 7: Communication Strategy

Risk	Impact	Comms Channel
Wider Traffic Disruption	Wider community and stakeholders informed through local and wider advertising and notification	Stakeholder Meetings Stakeholder email blast Email to local schools & Dept of Education
Construction related traffic	Ensure construction crews use traffic routes identified in the Traffic Management Plan, and Ensure residents in area are notified in advance to any traffic changes that may affect them	

Recently, communication has been undertaken with Penrith City Council, the care home and schools adjacent to the Site. Comments received has generally been accepting of the proposed construction strategy and have been included within **Appendix D**.

The responses of the initial communication to the key stakeholders are as follows;

Table 8: Stakeholder Responses

Stakeholder	Response
Catholic Education Diocese of Parramatta	We note and appreciate the restrictions on heavy vehicle movement during peak drop off and peak times. At this point, we have no further comment, but will monitor traffic flow and raise any safety concerns that may arise as the project progresses
The Anglican Schools Corporation	<p>The current designated "peak periods" nominated appear reasonable but should continue to be assessed during the works to identify as to whether these time periods need to be altered.</p> <p>The school is a "live environment" that can change quickly during any day and we feel that on-going effective communication between the school and those responsible for traffic management during the works should be maintained to provide the school with an avenue for raising any concerns.</p>

Stakeholder	Response
	<p>The peak periods identified are typical for a standard operating day. Each of the schools along Bakers Lane will have a number of "special days and activities" during the course of the year such as "grandparents day and carnivals" where peak period shall need to be extended and we request a mechanism be established for allowing effective communication of these requirements by the school.</p>
Catholic Healthcare	No issues

Following consultation with the key stakeholders, construction related traffic issues shall be monitored (as outlined within Section 6.1), be mitigated through the Community Consultation Strategy, and through meetings held throughout the project. Regular meetings shall be undertaken with key stakeholders in order to inform the stakeholders of any upcoming extra-ordinary activities. These meetings shall be utilised from both the OWE works and any additional school activities (such as carnivals or grandparents day).

This communications strategy outlines the most effective communication methods to ensure adequate information within the community and assist the project team to deliver the traffic changes with minimal disruption to the road network.

Furthermore, ongoing communication is also to be undertaken so that all stakeholders are kept up to date of works and potential impacts.

Appendix A

Traffic Movement Projections

Southern Access - Access Road Construction (Wk 1-12)							
	Pre-School	Morning School	Between School	Afternoon School	Post School		TOTAL
Passenger LV's	10	0	0	0	10		20
Passenger LV's	14	0	57	0	29		100
Heavy (Pavement)	27	0	66	0	27		120
Heavy (Materials)	13	0	16	0	11		40
Heavy (Ret Wall)	27	0	66	0	27		120
Heavy (Concrete)	3	0	4	0	3		10
Total	94	0	209	0	107		410
Southern Access - Main Road Works (Wk 13-31)							
	Pre-School Zones	Morning School Zone	Between School Zones	Afternoon School Zone	Post School Zones		TOTAL
Passenger LV's	25	0	0	0	25		50
Passenger LV's	14	0	57	0	29		100
Heavy (Pavement)	27	0	66	0	27		120
Heavy (Materials)	27	0	32	0	21		80
Heavy (Ret Wall)	14	0	32	0	14		60
Heavy (Concrete)	5	0	10	0	5		20
Total	112	0	197	0	121		430
Southern Access - Completion Works (Wk 32-50)							
	Pre-School Zones	Morning School Zone	Between School Zones	Afternoon School Zone	Post School Zones		TOTAL
Passenger LV's	25	0	0	0	25		50
Passenger LV's	16	0	61	0	33		110
Heavy (Pavement)	27	0	66	0	27		120
Heavy (Materials)	33	0	39	0	28		100
Heavy (Ret Wall)	0	0	0	0	0		0
Heavy (Concrete)	12	0	17	0	11		40
Total	113	0	183	0	124		420

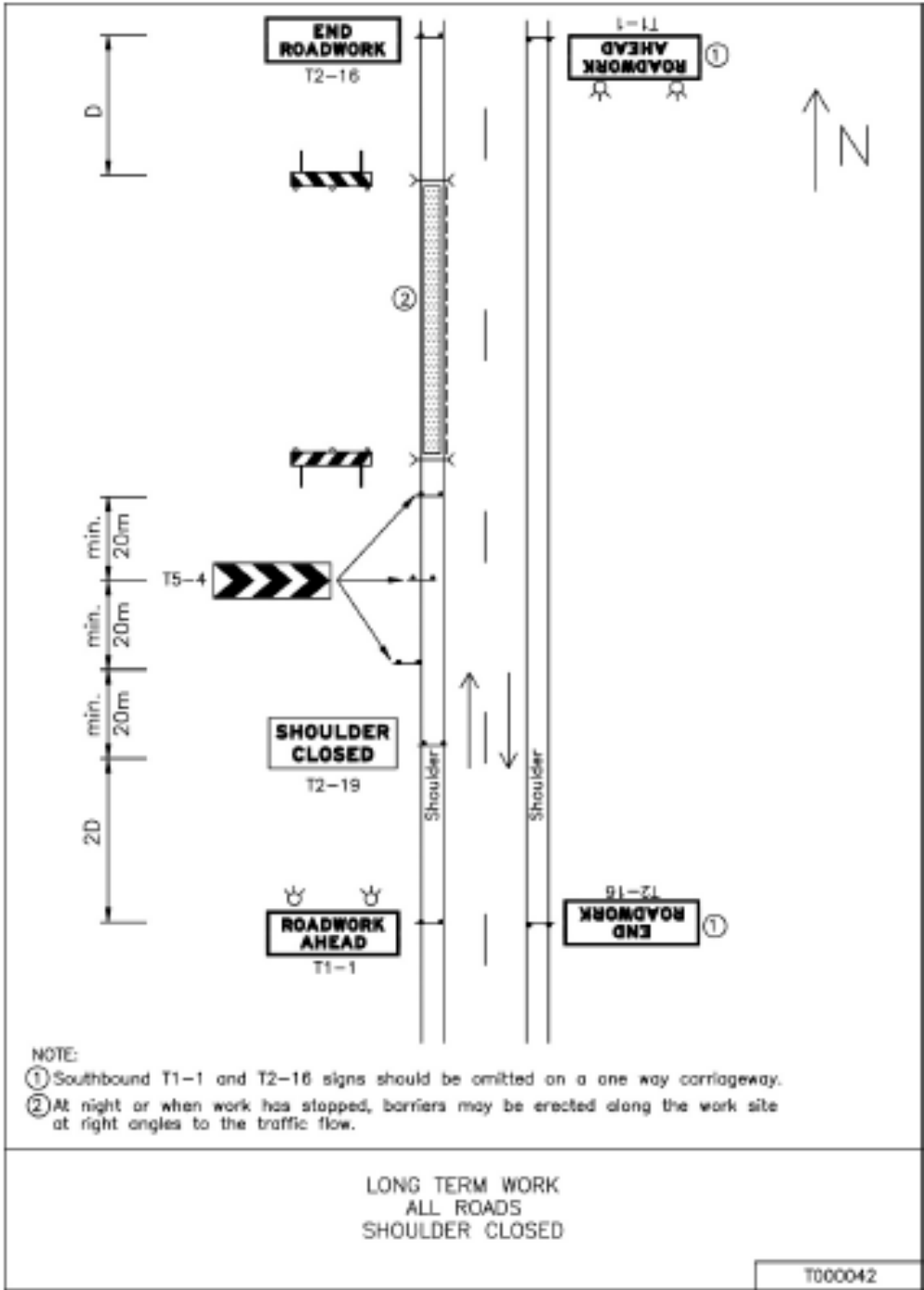
		Bridge Access - Early/Investigation Works (Wk 1-12)							
			Pre-School	Morning School	Between School	Afternoon School	Post School		TOTAL
		Passenger LV's	2	1	4	1	2		10
		Short Heavy Vehicles (<8.8m)	16	24	56	23	31		150
		Long Heavy Vehicles (>8.8m)	1	1	2	1	1		6
		Total	19	26	62	25	34		166
		Bridge Access - Main Construction Works (Wk 13-31)							
			Pre-School Zones	Morning School Zone	Between School Zones	Afternoon School Zone	Post School Zones		TOTAL
		Passenger LV's	2	1	4	1	2		10
		Short Heavy Vehicles (<8.8m)	16	21	30	17	16		100
		Long Heavy Vehicles (>8.8m)	3	4	6	3	3		20
		Total	21	26	40	22	21		130
		Bridge Access - Completion Works (Wk 32-50)							
			Pre-School Zones	Morning School Zone	Between School Zones	Afternoon School Zone	Post School Zones		TOTAL
		Passenger LV's	2	1	4	1	2		10
		Short Heavy Vehicles (<8.8m)	11	15	28	12	16		82
		Long Heavy Vehicles (>8.8m)	1	1	2	1	1		6
		Total	14	17	34	14	19		98

Northern Access - Northern Road Construction (Wk 1-12)							
	Pre-School Zones	Morning School Zone	Between School Zones	Afternoon School Zone	Post School Zones		
Passenger LV's	40	0	0	0	40		80
Passenger LV's	10	15	40	15	20		100
Heavy (Pavement)	4	8	18	6	4		40
Heavy (Materials)	20	12	24	8	16		80
Heavy (Ret Wall)	20	16	48	16	20		120
Heavy (Concrete)	2	2	2	2	2		10
	96	53	132	47	102		430
Northern Access - Main Road Works (Wk 13-31)							
	Pre-School Zones	Morning School Zone	Between School Zones	Afternoon School Zone	Post School Zones		
Passenger LV's	55	0	0	0	55		110
Passenger LV's	10	15	40	15	20		100
Heavy (Pavement)	20	16	48	16	20		120
Heavy (Materials)	8	6	12	6	8		40
Heavy (Ret Wall)	8	6	16	6	4		40
Heavy (Concrete)	4	2	8	2	4		20
	105	45	124	45	111		430
Northern Access - Completion Works (Wk 32-50)							
	Pre-School Zones	Morning School Zone	Between School Zones	Afternoon School Zone	Post School Zones		
Passenger LV's	75	0	0	0	75		150
Passenger LV's	11	17	42	17	23		110
Heavy (Pavement)	16	14	40	14	16		100
Heavy (Materials)	16	12	24	12	16		80
Heavy (Ret Wall)	0	0	0	0	0		0
Heavy (Concrete)	8	6	12	6	8		40
	126	49	118	49	138		480

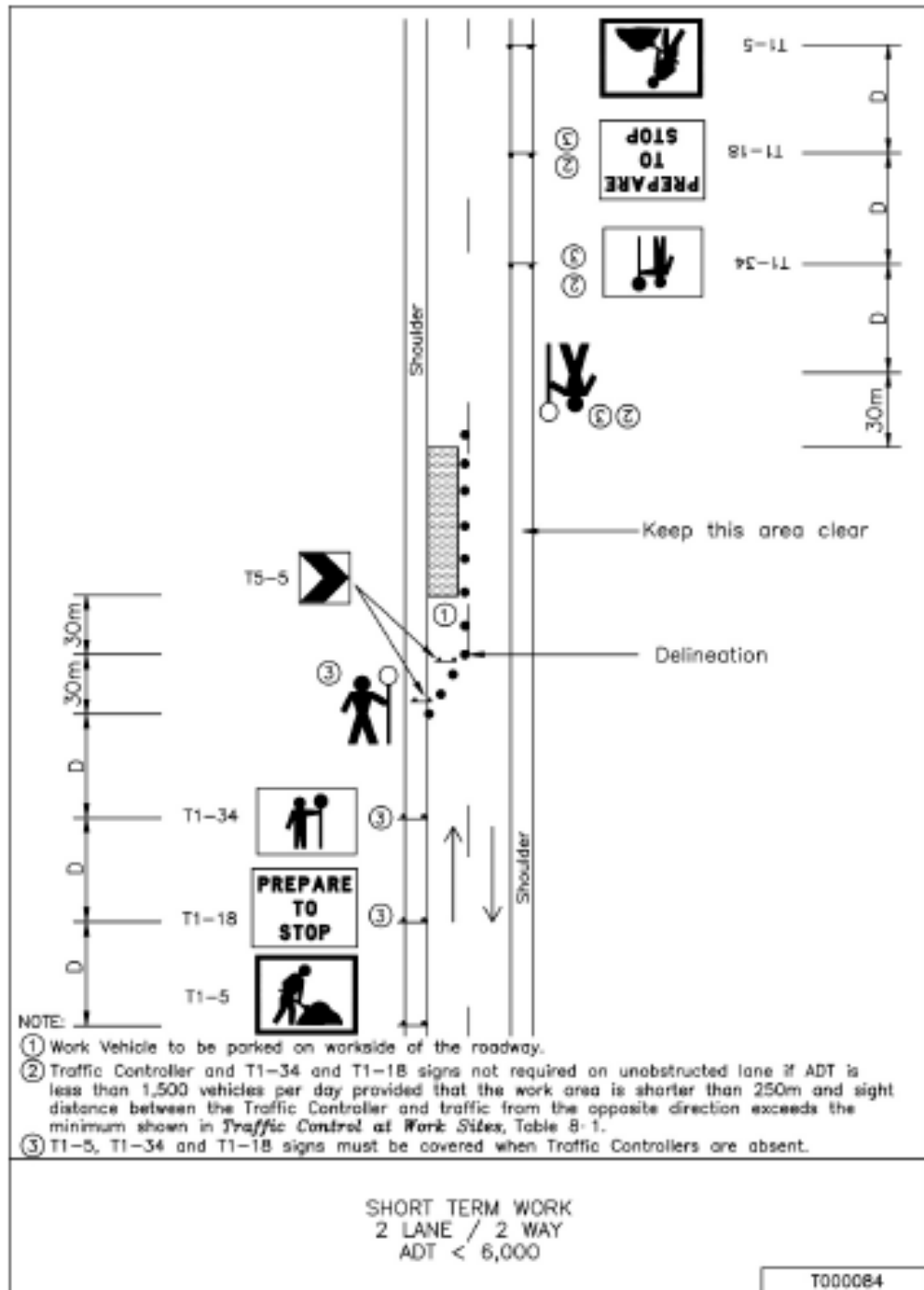
Appendix B

Indicative Traffic Control Plan(s)

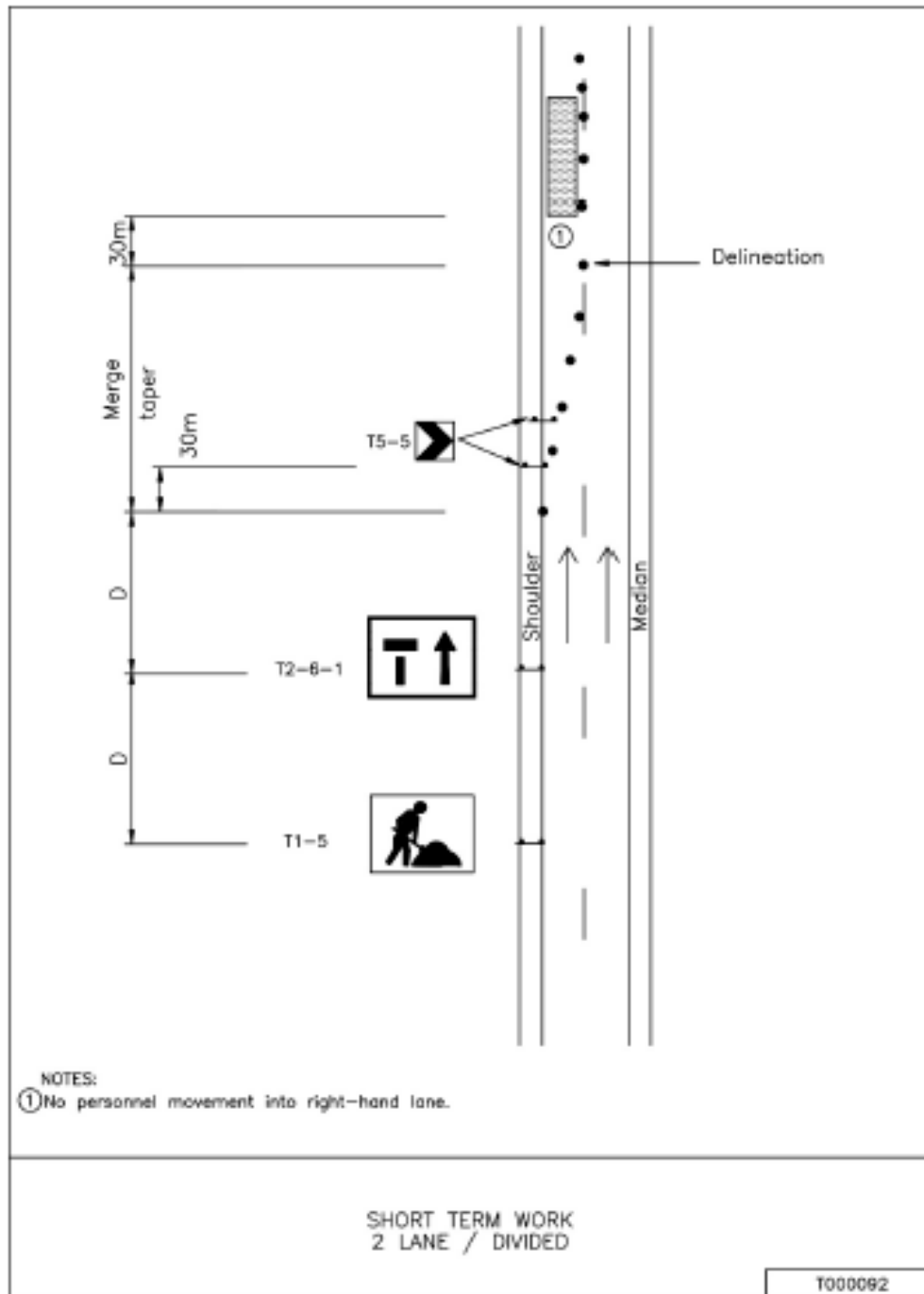
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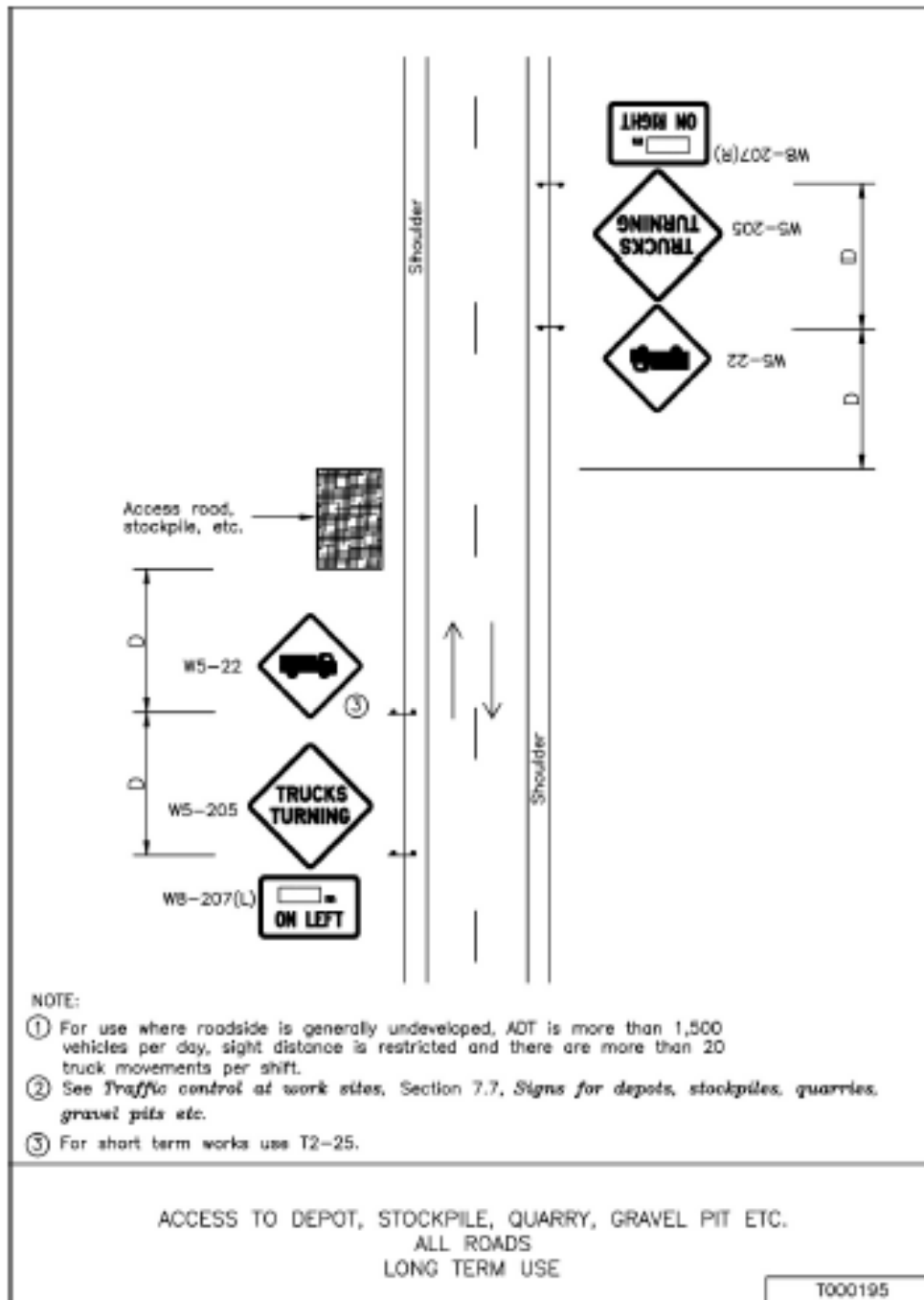
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TCP 92



TCP 195



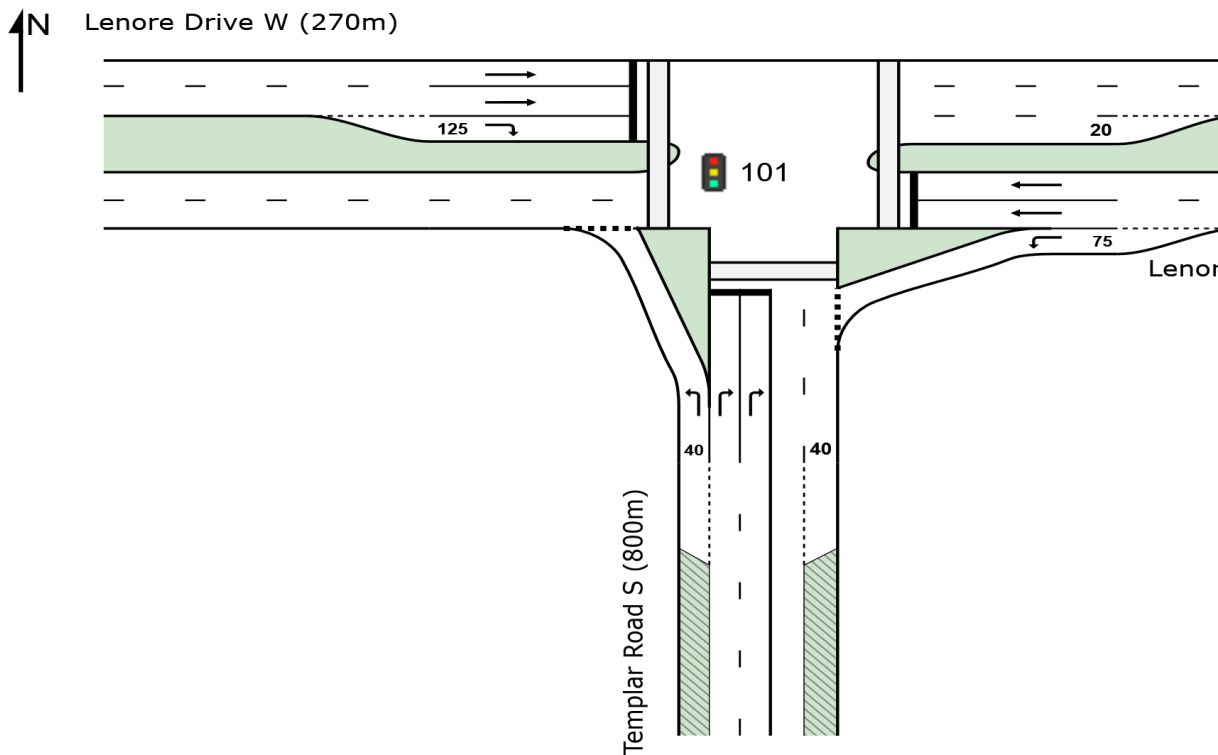
Appendix C

SIDRA Results

SITE LAYOUT

 **Site: 101 [Lenore / Templar_AM_EX]**

Lenore Drive x Templar Road
Period: AM
Scenario: Existing
Site Category: (None)
Signals - Actuated Isolated



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Organisation: ASON GROUP PTY LTD | Created: 5 July 2019 02:51:07

Project: C:\Users\timle\Downloads\AG0605m01v3 Lenore Dr x Templar Rd.sip8

MOVEMENT SUMMARY



Site: 101 [Lenore / Templar_AM_EX]

Lenore Drive x Templar Road

Period: AM

Scenario: Existing

Site Category: (None)

Signals - Actuated Isolated Cycle Time = 62 seconds (Minimum Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Templar Road S (800m)												
1	L2	86	20.7	0.074	7.4	LOS A	0.5	4.1	0.30	0.62	0.30	52.8
3	R2	94	32.6	0.223	29.5	LOS C	2.0	18.2	0.84	0.74	0.84	40.9
Approach		180	26.9	0.223	18.9	LOS B	2.0	18.2	0.58	0.68	0.58	45.6
East: Lenore Drive E (390m)												
4	L2	180	20.5	0.176	10.9	LOS A	1.5	12.7	0.45	0.71	0.45	55.3
5	T1	177	31.0	0.218	22.7	LOS B	2.3	20.2	0.83	0.66	0.83	45.9
Approach		357	25.7	0.218	16.8	LOS B	2.3	20.2	0.64	0.68	0.64	51.5
West: Lenore Drive W (270m)												
11	T1	786	9.1	0.353	9.1	LOS A	7.0	52.5	0.60	0.52	0.60	61.7
12	R2	354	3.9	0.742	33.1	LOS C	10.6	76.5	0.98	0.85	0.98	40.9
Approach		1140	7.5	0.742	16.5	LOS B	10.6	76.5	0.72	0.62	0.72	50.9
All Vehicles		1677	13.4	0.742	16.8	LOS B	10.6	76.5	0.69	0.64	0.69	50.2

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	20.2	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	5	20.2	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	5	20.2	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		16	20.2	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: ASON GROUP PTY LTD | Processed: 6 July 2018 03:31:30

Project: C:\Users\timle\Downloads\AG0605m01v3 Lenore Dr x Templar Rd.sip8

MOVEMENT SUMMARY



Site: 101 [Lenore / Templar_PM_EX]

Lenore Drive x Templar Road

Period: PM

Scenario: Existing

Site Category: (None)

Signals - Actuated Isolated Cycle Time = 62 seconds (Minimum Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Templar Road S (800m)												
1	L2	348	4.2	0.355	9.7	LOS A	4.0	29.3	0.51	0.71	0.51	52.7
3	R2	107	27.5	0.261	29.5	LOS C	2.3	20.2	0.85	0.74	0.85	41.3
Approach		456	9.7	0.355	14.4	LOS A	4.0	29.3	0.59	0.72	0.59	49.2
East: Lenore Drive E (390m)												
4	L2	94	37.1	0.083	9.1	LOS A	0.4	4.1	0.26	0.65	0.26	56.1
5	T1	854	6.4	0.641	20.2	LOS B	11.3	83.8	0.89	0.77	0.89	48.2
Approach		947	9.4	0.641	19.1	LOS B	11.3	83.8	0.83	0.76	0.83	49.3
West: Lenore Drive W (270m)												
11	T1	148	18.4	0.068	5.8	LOS A	1.0	7.7	0.43	0.34	0.43	67.2
12	R2	103	9.2	0.355	34.5	LOS C	2.9	22.2	0.91	0.77	0.91	40.3
Approach		252	14.6	0.355	17.6	LOS B	2.9	22.2	0.63	0.52	0.63	49.7
All Vehicles		1655	10.3	0.641	17.6	LOS B	11.3	83.8	0.73	0.71	0.73	49.3

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	22.7	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	5	22.7	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	5	22.7	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		16	22.7	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: ASON GROUP PTY LTD | Processed: 6 July 2018 03:34:31

Project: C:\Users\timle\Downloads\AG0605m01v3 Lenore Dr x Templar Rd.sip8

MOVEMENT SUMMARY



Site: 101 [Lenore / Templar_AM_EX+CONSTRUCTION]

Lenore Drive x Templar Road

Period: AM

Scenario: Existing+WNSLR Construction Traffic

Site Category: (None)

Signals - Actuated Isolated Cycle Time = 62 seconds (Minimum Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Templar Road S (800m)												
1	L2	94	27.0	0.083	7.4	LOS A	0.5	4.7	0.30	0.62	0.30	52.2
3	R2	107	41.2	0.268	29.9	LOS C	2.4	22.4	0.85	0.74	0.85	40.0
Approach		201	34.6	0.268	19.4	LOS B	2.4	22.4	0.59	0.69	0.59	44.6
East: Lenore Drive E (390m)												
4	L2	222	23.7	0.232	11.8	LOS A	2.2	18.9	0.51	0.72	0.51	54.6
5	T1	177	31.0	0.218	22.7	LOS B	2.3	20.2	0.83	0.66	0.83	45.9
Approach		399	26.9	0.232	16.6	LOS B	2.3	20.2	0.65	0.69	0.65	51.6
West: Lenore Drive W (270m)												
11	T1	786	9.1	0.353	9.1	LOS A	7.0	52.5	0.60	0.52	0.60	61.7
12	R2	423	4.5	0.892	35.9	LOS C	13.8	100.6	1.00	0.88	1.06	39.8
Approach		1209	7.5	0.892	18.4	LOS B	13.8	100.6	0.74	0.65	0.76	49.1
All Vehicles		1809	14.8	0.892	18.2	LOS B	13.8	100.6	0.70	0.66	0.72	49.0

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	20.2	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	5	20.2	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	5	20.2	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		16	20.2	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Organisation: ASON GROUP PTY LTD | Processed: 5 July 2019 02:47:16

Project: C:\Users\timle\Downloads\AG0605m01v3 Lenore Dr x Templar Rd.sip8

MOVEMENT SUMMARY



Site: 101 [Lenore / Templar_PM_EX+CONSTRUCTION]

Lenore Drive x Templar Road

Period: PM

Scenario: Existing+WNSLR Construction Traffic

Site Category: (None)

Signals - Actuated Isolated Cycle Time = 62 seconds (Minimum Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Templar Road S (800m)												
1	L2	378	5.8	0.389	9.9	LOS A	4.5	33.3	0.53	0.72	0.53	52.4
3	R2	139	31.1	0.345	30.1	LOS C	3.1	27.5	0.86	0.76	0.86	40.8
Approach		517	12.6	0.389	15.3	LOS B	4.5	33.3	0.62	0.73	0.62	48.4
East: Lenore Drive E (390m)												
4	L2	115	45.0	0.106	9.2	LOS A	0.6	5.5	0.27	0.66	0.27	55.8
5	T1	854	6.4	0.641	20.2	LOS B	11.3	83.8	0.89	0.77	0.89	48.2
Approach		968	11.0	0.641	18.9	LOS B	11.3	83.8	0.82	0.76	0.82	49.5
West: Lenore Drive W (270m)												
11	T1	148	18.4	0.068	5.8	LOS A	1.0	7.7	0.43	0.34	0.43	67.2
12	R2	114	12.0	0.398	34.8	LOS C	3.3	25.3	0.92	0.78	0.92	40.1
Approach		262	15.7	0.398	18.4	LOS B	3.3	25.3	0.64	0.53	0.64	49.0
All Vehicles		1747	12.2	0.641	17.8	LOS B	11.3	83.8	0.73	0.72	0.73	49.0

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

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

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	5	22.7	LOS C	0.0	0.0	0.90	0.90
P2	East Full Crossing	5	22.7	LOS C	0.0	0.0	0.90	0.90
P4	West Full Crossing	5	22.7	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		16	22.7	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Project: C:\Users\timle\Downloads\AG0605m01v3 Lenore Dr x Templar Rd.sip8

Appendix D

Stakeholder Engagement

From: [Matthew Bond](#)
To: [Dan Thompson](#)
Subject: Re: FW: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan
Date: Monday, 28 October 2019 12:27:15 PM
Attachments: [image88b29.PNG](#)
[image9ab959.PNG](#)
[image4ca9.PNG](#)
[image001.txd](#)
[image99b915.JPG](#)
[image1db666.PNG](#)
[image22327.PNG](#)
[image1ec315.PNG](#)
[image99aed.PNG](#)
[imagec601fe.PNG](#)
[image2c9e56.PNG](#)
[image571b86.PNG](#)

Hello Daniel

At this point I have no immediate questions.
I will be at the meeting next week on the 7th November.

Regards
Matthew

On Fri, 25 Oct 2019 at 12:39, Dan Thompson <dthompson@slrconsulting.com> wrote:

Hi Matt

Thanks for your time on the phone earlier. As discussed the attached Construction Traffic Management Plan (CTMP) documents have been prepared to identify how traffic movements will be managed during the construction phase of the project. Could you please have a look at the documents, with the smaller summary letter providing a good overview, and advise if you have any comments, or aspects you would like to discuss.

Additionally, we have arranged an initial community stakeholder meeting. The initial stakeholder meeting is being held at Goodman's Oakdale South site (refer to the map below showing the location) at 11.30 on 7 November 2019. The intent of this meeting is to establish clear channels of communication moving forward; introduce key project contacts; and provide additional details of the construction program.

Can you please confirm the number of attendees from within your organisation?

Thanks

Dan

Meeting Location

cid:image002.jpg@01D58832.424F6720



Dan Thompson

Principal Planner - Environmental & Social Impact Assessment

+61 428 060 995
+61 409 226 875
dthompson@slrconsulting.com

SLR Consulting Australia Pty Ltd
Level 1, The Central Building, Innovation Campus, Squires Way, North Wollongong, NSW, 2500



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From: Dan Thompson
Sent: Friday, 18 October 2019 2:52 PM
To: 'chey@parra.catholic.edu.au' <chey@parra.catholic.edu.au>
Subject: FW: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Cathy

I called earlier and left a message in relation to the below and attached. Can you please advise if you have any comments on the CTMP documentation.

I'm happy to discuss any aspects if you have queries.

Regards

Dan

From: Dan Thompson <dthompson@slrconsulting.com>
Sent: Thursday, 22 August 2019 9:08 AM
To: chey@parra.catholic.edu.au
Cc: marijana.mitrovic@mamre.nsw.edu.au
Subject: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Cathy

Thanks for your time on the phone earlier.

As discussed, the attached documents have been prepared to inform traffic management during the construction of the Oakdale West Estate and Western North South Link Road. Can you please review the documents and provide any comments by 30 August 2019. The document comprise:

- Summary Letter identifying truck movements, timing and duration, along with associated impacts
- Construction Traffic Management Plan for the WNSLR
- Construction Traffic Management Plan for the Oakdale West Estate

A key point to note is Bakers Lane will be used initially for construction traffic, with traffic then using the Western North-South Link Road connection northwards to Lenore Drive.

If you have any queries please contact me, with my details below.

Regards

Dan

Dan Thompson

Principal Planner - Environmental & Social Impact Assessment

+61 428 060 995
+61 2 9427 8100
dthompson@slrconsulting.com

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Level 1, The Central Building, Innovation Campus
Squires Way, Wollongong, NSW, 2500

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Matthew Bond
Assistant Principal
Trinity Catholic Primary School
Kemps Creek
Ph: (02)8856-6200
Mbond@parra.catholic.edu.au



30th August 2019.

SLR Consulting Pty Ltd.
Level 1, The Central Building, Innovation Campus
Squires Way, Wollongong NSW 2500
Attention: Dan Thompson

RE: Western North-South Link Road Oakdale West Estate – Construction Traffic Management Plan

Dear Dan,

We would like to thank you for your recent correspondence regarding proposed construction traffic management for the above mentioned project. We acknowledge that the plan has identified the current schools on Bakers Lane as key stake holders in the area and has attempted to address traffic management during construction and make the following additionally commentary:

- The current designated "peak periods" nominated appear reasonable but should continue to be assessed during the works to identify as to whether these time periods need to be altered.
- The school is a "live environment" that can change quickly during any day and we feel that on-going effective communication between the school and those responsible for traffic management during the works should be maintained to provide the school with an avenue for raising any concerns.
- The peak periods identified are typical for a standard operating day. Each of the schools along Bakers Lane will have a number of "special days and activities" during the course of the year such as "grandparents day and carnivals" where peak period shall need to be extended and we request a mechanism be established for allowing effective communication of these requirements by the school.

Should there be any queries regarding the above please do not hesitate to contact myself 02 8567 4000 or Cathie Graydon (school Principal) on 02 9834 1881

Kind regards

Dennis Macan
Capital Works Manager
The Anglican Schools Corporation

James Laidler

From: James Byrne <jbyrne@chcs.com.au>
Sent: Friday, 30 August 2019 2:40 PM
To: Dan Thompson
Cc: Kate Todd
Subject: Re: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Dan,

We have no issues with the process you outline.

Thanks

James



James Byrne | Building Services Manager | Property | Macquarie Park
| M. 0434 604 370 | catholichealthcare.com.au

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From: Dan Thompson <dthompson@slrconsulting.com>
Sent: Friday, August 30, 2019 2:35:06 PM
To: James Byrne <jbyrne@chcs.com.au>
Cc: Kate Todd <ktodd@chcs.com.au>
Subject: RE: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi James

Could you please let me know if you will be providing a response to the CTMP documents today?

Thanks



Dan Thompson

Principal Planner - Environmental & Social Impact Assessment

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 +61 2 9427 8100

 dthompson@slrconsulting.com

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From: Dan Thompson

Sent: Wednesday, 28 August 2019 11:52 AM

To: James Byrne <jbyrne@chcs.com.au>

Cc: Kate Todd <ktodd@chcs.com.au>

Subject: RE: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi James

I'm just following up on the CTMPs sent through last week.

Could you please let me know if you do have any comments by this Friday.

Thanks

Dan

From: James Byrne <jbyrne@chcs.com.au>

Sent: Friday, 23 August 2019 12:52 PM

To: Dan Thompson <dthompson@slrconsulting.com>

Cc: Kate Todd <ktodd@chcs.com.au>

Subject: RE: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Thanks Dan,

For us here at Catholic Healthcare, please send to me.

Thanks

James

=====

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=====

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From: Dan Thompson [<mailto:dthompson@slrconsulting.com>]
Sent: Thursday, 22 August 2019 3:48 PM
To: James Byrne <jbyrne@chcs.com.au>
Cc: Kate Todd <ktodd@chcs.com.au>
Subject: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi James

Thanks for your time on the phone earlier.

As discussed, the attached documents have been prepared to inform traffic management during the construction of the Oakdale West Estate and Western North South Link Road. Can you please review the documents and provide any comments by 30 August 2019. The document comprise:

- ☐ Summary Letter identifying truck movements, timing and duration, along with associated impacts
- ☐ Construction Traffic Management Plan for the WNSLR
- ☐ Construction Traffic Management Plan for the Oakdale West Estate

A key point to note is Bakers Lane will be used initially for construction traffic, with traffic then using the Western North-South Link Road connection northwards to Lenore Drive.




Can you please let me know who the best contact is for Emmaus Village moving forward, if not you?

If you have any queries please contact me, with my details below.

Regards
Dan



Dan Thompson
Principal Planner - Environmental & Social Impact Assessment

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James Laidler

From: Dan Thompson <dthompson@slrconsulting.com>
Sent: Wednesday, 28 August 2019 11:53 AM
To: 'mpruscino@parra.catholic.edu.au'
Cc: 'julian.concato@parracatholic.org'
Subject: RE: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Michael

I'm just following up on the CTMP sent through last week.

Could you please let me know if you do have any comments by this Friday.

Thanks
Dan

From: Dan Thompson
Sent: Thursday, 22 August 2019 3:50 PM
To: mpruscino@parra.catholic.edu.au
Cc: julian.concato@parracatholic.org
Subject: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Michael

Thanks for your time on the phone earlier.

As discussed, the attached documents have been prepared to inform traffic management during the construction of the Oakdale West Estate and Western North South Link Road. Can you please review the documents and provide any comments by 30 August 2019. The document comprise:

- Summary Letter identifying truck movements, timing and duration, along with associated impacts
- Construction Traffic Management Plan for the WNSLR
- Construction Traffic Management Plan for the Oakdale West Estate

A key point to note is Bakers Lane will be used initially for construction traffic, with traffic then using the Western North-South Link Road connection northwards to Lenore Drive.

Can you please let me know who the best contact is for Emmaus School moving forward, if not you?

If you have any queries please contact me, with my details below.

Regards
Dan

James Laidler

From: Dan Thompson <dthompson@slrconsulting.com>
Sent: Wednesday, 28 August 2019 11:55 AM
To: 'chey@parra.catholic.edu.au'
Subject: RE: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Cathy

I'm just following up on the CTMPs sent through last week.

Could you please let me know if you do have any comments by this Friday.

Thanks
Dan

From: Dan Thompson
Sent: Thursday, 22 August 2019 9:08 AM
To: chey@parra.catholic.edu.au
Cc: marijana.mitrovic@mamre.nsw.edu.au
Subject: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Cathy

Thanks for your time on the phone earlier.

As discussed, the attached documents have been prepared to inform traffic management during the construction of the Oakdale West Estate and Western North South Link Road. Can you please review the documents and provide any comments by 30 August 2019. The document comprise:

- Summary Letter identifying truck movements, timing and duration, along with associated impacts
- Construction Traffic Management Plan for the WNSLR
- Construction Traffic Management Plan for the Oakdale West Estate

A key point to note is Bakers Lane will be used initially for construction traffic, with traffic then using the Western North-South Link Road connection northwards to Lenore Drive.

If you have any queries please contact me, with my details below.

Regards
Dan

James Laidler

From: Michael Pruscino <mpruscino@parra.catholic.edu.au>
Sent: Wednesday, 23 October 2019 2:43 PM
To: Dan Thompson
Cc: julian.concato@parracatholic.org; Harvey ANCHIQUE; Kate McKinnon; Bill Togher; David Cosgrove; Robert Nastasi
Subject: Re: FW: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Dan
Thank you for the opportunity to review and comment
We note and appreciate the restrictions on heavy vehicle movement during peak drop off and peak times

At this point, we have no further comment, but will monitor traffic flow and raise any safety concerns that may arise as the project progresses
Regards

Michael Pruscino
Schools Development Manager
Catholic Education Diocese of Parramatta
12 Victoria Road (Locked Bag 4) North Parramatta NSW 1740
T-02 9840 5795 F-02 9840 5699 M-0429 982 477
mpruscino@parra.catholic.edu.au
www.parra.catholic.edu.au

On Tue, 22 Oct 2019 at 10:00, Dan Thompson <dthompson@slrconsulting.com> wrote:

Hi Michael

As per my voice message, I would like to discuss both the CTMP documents provided and an initial community stakeholder meeting being held prior to the commencement of construction.

The CTMP details are attached.

The initial community stakeholder meeting is being held at Goodman's Oakdale South site (refer to the map below showing the location) at 11.30 on 7 November 2019. The intent of this meeting is to establish clear channels of communication moving forward; introduce key project contacts; and provide additional details of the construction program.

Can you please confirm the number of attendees from within your organisation?

Thanks

Dan

Meeting Location





Dan Thompson

Principal Planner - Environmental & Social Impact Assessment

 +61 428 060 995

 +61 409 226 875

 dthompson@slrconsulting.com

SLR Consulting Australia Pty Ltd
Level 1, The Central Building, Innovation Campus, Squires Way, North Wollongong, NSW, 2500



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From: Dan Thompson
Sent: Friday, 18 October 2019 2:45 PM
To: 'mpruscino@parra.catholic.edu.au' <mpruscino@parra.catholic.edu.au>
Cc: 'julian.concato@parracatholic.org' <julian.concato@parracatholic.org>
Subject: FW: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Michael

I called earlier and left a message in relation to the below and attached. Can you please advise if you have any comments on the CTMP documentation.

I'm happy to discuss any aspects if you have queries.

Regards

Dan

From: Dan Thompson <dthompson@slrconsulting.com>
Sent: Thursday, 22 August 2019 3:50 PM
To: mpruscino@parra.catholic.edu.au
Cc: julian.concato@parracatholic.org
Subject: Western North-South Link Road/Oakdale West Estate - Construction Traffic Management Plan

Hi Michael

Thanks for your time on the phone earlier.

As discussed, the attached documents have been prepared to inform traffic management during the construction of the Oakdale West Estate and Western North South Link Road. Can you please review the documents and provide any comments by 30 August 2019. The document comprise:

- Summary Letter identifying truck movements, timing and duration, along with associated impacts
- Construction Traffic Management Plan for the WNSLR

- Construction Traffic Management Plan for the Oakdale West Estate

A key point to note is Bakers Lane will be used initially for construction traffic, with traffic then using the Western North-South Link Road connection northwards to Lenore Drive.

Can you please let me know who the best contact is for Emmaus School moving forward, if not you?

If you have any queries please contact me, with my details below.

Regards

Dan

Dan Thompson

Principal Planner - Environmental & Social Impact Assessment

 +61 428 060 995

 +61 2 9427 8100

 dthompson@slrconsulting.com

SLR Consulting Australia Pty Ltd
Level 1, The Central Building, Innovation Campus
Squires Way, Wollongong, NSW, 2500

Appendix E

WaterNSW Approval

Consent: F2019/5263

Robson Civil Projects Pty Ltd
1280 Old Pacific Highway
SOMERSBY NSW 2250

Attn: Mr Mark DOLAN

Email: Mark.Dolan@robsoncivil.com.au; Tim.Dillon@robson.civil.com.au

Dear Mr Dolan

I refer to your application for Consent to enter the Controlled Area. Water NSW provides conditional Consent for Robson Civil Projects Pty Ltd to enter the Warragamba Pipeline Controlled Area under clause 10 of the Water NSW Regulation 2013, for activities associated with Dilapidation Survey of the Warragamba pipelines for the Western North South Link Road project.

This Consent is subject to the following conditions:

General

1. This Consent is valid from 4 November 2019 and expires on 15 November 2019;
2. Water NSW grants Consent to undertake relevant activities associated with Dilapidation Survey of the Warragamba pipelines for the Western North South Link Road project that are otherwise prohibited under clauses 16(2), 17(1)(a-d)(l)(m), 22(1)(a), 24(1) and 25(1)(a)(e-h) of the Water NSW Regulation 2013 **(the Permitted Activity)**;
3. Entry is for Robson Civil Projects Pty Ltd **(the Consent Holder)** employees, clients, contractors and sub-contractors only. The Consent Holder is responsible for providing adequate supervision of its employees, clients, contractors or sub-contractors to ensure the conditions of this Consent are complied with;
4. The Consent Holder must consult with Water NSW where the Consent Holder becomes aware that the Permitted Activity will:
 - a) significantly increase in scale, or
 - b) interfere with other users or activities in the Warragamba Pipeline Controlled Area.

If any of the above creates a risk then the group size or type of activity may be limited;

5. Entry is restricted to Lot 23 DP 1246626, Lot 24 DP 1246626, Lots 2 DP 84578, Lot 3 DP 84578, Lot 1 DP 131458 and Lot 1 DP 84578;
6. All works subject to this Consent must be carried out in accordance with the document titled 'Western North South Link Road – Safe Work Plan – Dilapidation Survey and Vibration Monitoring Works in WaterNSW Corridor – SWP.WNSW.003', Version 5.0 dated 21 October 2019, prepared by Robson Civil Projects;

7. Waste as defined under the *Protection of the Environment Operations Act 1997* (POEO Act), must not be brought into the Controlled Area;

Entry

8. The permitted method of entry is by vehicle via Old Wallgrove Road and by foot, with the number of vehicles and persons entering restricted to the minimum necessary to complete the Permitted Activity;
9. Prior to entry, all vehicle/s, plant and equipment to be used in the Controlled Area must be washed down, free of weeds, seeds and soil;
10. The Consent Holder must ensure that appropriate safety and recovery equipment consistent with the Consent Holder's Safe Work Plan and/or other Work Health and Safety requirements is available for use while conducting the Permitted Activity;
11. The Consent Holder and its clients, contractors and sub-contractors entering the Controlled Area must have suitable communications in place for reliable and effective use. All persons must carry a mobile phone and an adequate first aid kit that includes a compression bandage/s suitable for snake bite, and persons must be suitably trained to administer first aid;
12. All gates and barriers, including temporary fencing, must be secure at all times to prevent unauthorised entry to the Controlled Area;
13. Access along the Warragamba Pipelines must be available for Water NSW employee and contractor use at all times;
14. The driver of any vehicle must obey all speed advisory and warning signs within the Controlled Area. Vehicle speed must be relevant to the conditions at the time and not exceed 40 km/h, unless otherwise signposted;
15. Any vehicles, equipment or machinery left on site must be secured at all times;
16. All vehicles, equipment and machinery used in the Controlled Area must be:
 - a) maintained in a proper and efficient condition, and
 - b) operated in a safe, proper and efficient manner;
17. Activities under this Consent must be carried out in a competent manner in the Controlled Area and must not block or impede traffic;
18. Activities under this Consent conducted in the Controlled Area must not have an adverse effect on:
 - a) water quality, or
 - b) the environment, or
 - c) other users or activities in the Controlled Area;
19. The Consent Holder's compliance with the conditions of this Consent may be the subject of monitoring or audit by Water NSW from time to time. The Consent Holder must fully cooperate in the compliance monitoring or audit process;
20. Water NSW may restrict entry to the Controlled Area at any time due to adverse or wet weather, river flooding, bushfire or for other operational reasons and/or safety reasons;

21. The Consent Holder must contact the Water NSW principal contact (refer Condition 61) during business hours, or call **1800 061 069** prior to entering the Controlled Area to check if the area is closed in the event of:
 - a) adverse or wet weather, or
 - b) operational reasons, or
 - c) a Total Fire Ban or unfavourable Fire Danger Rating;
22. Activities conducted under this Consent that are likely to cause a fire or create a fire hazard are not to be conducted without prior approval from the Water NSW principal contact (refer Condition 61);
23. In the event that the Warragamba Pipeline Controlled Area is closed, entry to that Area is prohibited (except for Water NSW approved emergency works);
24. Persons entering the Warragamba Pipeline Controlled Area must adhere to the directions of any Water NSW officer;
25. The Consent Holder must arrange appropriate photographic identification for all persons that require entry to the Warragamba Pipeline Controlled Area prior to entry, and all persons that enter the Warragamba Pipeline Controlled Area under this Consent must produce this identification to any Water NSW officer or Security Officer upon request;

Insurance and Safe Work Plan

26. Prior to the commencement of activities under this Consent, the Consent Holder must supply a copy of Robson Civil Projects Pty Ltd and its clients, contractor/s and sub-contractor/s current Public Liability Insurance to Water NSW, that covers liability for damage to property (both real and personal) and injury to persons (including death), for which shall cover Water NSW, the Consent Holder and any person entitled to enter the Controlled Area under this Consent. A copy of the renewal/s or new insurance certificate/s must be emailed to compliance@waternsw.com.au immediately upon expiry of the current insurance certificate/s;
27. Prior to the first entry, a copy of an appropriate, relevant and specific Safe Work Plan to be followed during the activity must be provided to Water NSW. The Safe Work Plan must include, but not be limited to, details of the identified risks, controls to be implemented to ensure health and safety, and communications and emergency procedures. The purpose of Water NSW sighting the Safe Work Plan is to ensure that known hazards are considered. Water NSW does not endorse or approve the details of the controls put in place by the Consent Holder to manage the hazards. A copy of any amended or renewed safety documentation must be emailed to compliance@waternsw.com.au immediately when amendments or renewals occur;
28. All Safe Work Plans in relation to ongoing work must be endorsed or approved by the Consent Holder for the ongoing existence of this Consent;
29. All contractors and sub-contractors must make reference in their Safe Work Plan that they will adhere to any requirements (such as environmental assessments, development consent conditions and/or other Statutory Approvals, and/or relevant guidelines) as set out by the Consent Holder;
30. All activities under this Consent must be carried out in accordance with the duties under Work Health and Safety legislation;
31. Persons entering the Controlled Area must take reasonable care for his or her own health and safety and take reasonable care that his or her acts or omissions do not

adversely affect the health and safety of other persons. The Consent Holder must have adequate skills and experience to ensure the safety of all persons entering the Controlled Area in the changeable circumstances that will be encountered, including but not limited to, changing weather and fire danger;

32. All activities under this Consent must be carried out in accordance with the appropriate, relevant and specific Safe Work Plan, which has been approved or endorsed by the Consent Holder;

Water NSW Induction

33. Unless otherwise instructed by your Water NSW principal contact (refer Condition 61), Water NSW requires all persons (including clients, contractor/s and subcontractor/s) who enter the Warragamba Pipeline Controlled Area to complete a safety induction held at the Water NSW Warragamba Office. The Water NSW safety induction is arranged by completing and emailing the attached Work Request Form to Water NSW's Mr Shaun Osborn shaun.osborn@waternsw.com.au. Water NSW requires at least ten (10) business days' notice to arrange the safety induction and key handover (if required). It is preferable that two or three alternate dates are provided on the form. Your Water NSW principal contact (refer Condition 61) will advise if an on-site induction conducted by Water NSW is required;

Notification and Incident Reporting

34. Prior to entry the Consent Holder and its clients, contractor/s and/or subcontractor/s must make contact with Water NSW officer, Ms Khanittha Poonbua, on (02) 4640 1247 or 0409 435 488 and email khanittha.poonbua@waternsw.com.au, to ensure the Permitted Activity does not conflict with the current Water NSW Warragamba Pipelines Urgent Works Project, and to arrange an on-site induction conducted by the WaterNSW Urgent Works contractor if required;
35. The on-site supervisor is required to notify the Water NSW principal contact (refer Condition 61) by telephone when they arrive and leave the site;
36. The Consent Holder must notify Water NSW of any health, safety or environmental incident that occurs in Special and Controlled Areas that has caused harm or is likely to cause harm to personnel, the environment or Water NSW operations, including any injury that requires medical treatment, any incident with serious potential consequences, and any spill, near miss or fire sighting. The Consent Holder must notify Water NSW as soon as reasonably practicable, after emergency notifications and emergency response/treatment, by telephoning the **Incident Notification Number 1800 061 069 (24 hour service)**;
37. If the Consent Holder fails to comply with any condition of this Consent, the Consent Holder must notify the Water NSW principal contact (refer Condition 61) immediately upon becoming aware of the breach;
38. The Consent Holder must provide a comprehensive written report within seven (7) days to Water NSW, attention the Catchment Compliance Manager when:
- a) an incident is reported to the Water NSW Incident Notification Number, or
 - b) the Consent Holder has defaulted on, or failed to comply with, any of the conditions of this Consent, or
 - c) the Consent Holder has not acted in a responsible manner in discharging the conditions of this Consent, or
 - d) upon request where Water NSW reasonably suspects that an event or incident has occurred or is likely to occur that is likely to cause harm to:
 - i. the Special/Controlled Area, or
 - ii. the environment, or

- iii. Water NSW operations, or
- iv. any other organisation, or
- v. a person/s.

The report must contain details of what occurred and when, also any actions taken to rectify the matter. Electronic copies emailed to compliance@waternsw.com.au and hard copies posted to PO Box 398, Parramatta NSW 2124;

Water NSW Keys

- 39. Up to two (2) keys may be issued by Water NSW to the Consent Holder if required.
- 40. Key/s are issued to the Consent Holder, remain the property of Water NSW and must not be transferred or given to any other person. No person shall knowingly alter, duplicate, or copy any key;
- 41. Water NSW keys must only be used to enter the Controlled Area in accordance with the conditions of this Consent;
- 42. Keys shall be returned promptly (within seven (7) days) to Water NSW when:
 - a) the keys are no longer required for authorised purposes, or
 - b) this Consent expires, or
 - c) if requested by Water NSW;
- 43. The Consent Holder shall take measures to protect and safeguard any keys issued to them;
- 44. The Consent Holder must notify Water NSW within 24 hours by notifying the Water NSW principal contact (refer Condition 61) and emailing special_area_access@waternsw.com.au when they become aware that keys have been lost, damaged, missing or stolen;
- 45. The Consent Holder must make a written application to Water NSW by emailing special_area_access@waternsw.com.au for any additional or replacement key/s;
- 46. The Consent Holder will bear the cost of any additional or replacement key/s that are either lost, damaged, missing or stolen;

Rehabilitation Costs

- 47. The Consent Holder is liable for all rehabilitation costs incurred as a result of inappropriate activity on the part of the Consent Holder or any person entitled to enter the Controlled Area under this Consent. Any damage to the Warragamba pipelines caused at any stage during the development process shall be repaired by the Consent Holder, or the Consent Holder shall pay all reasonable costs associated with repairing the damaged water supply infrastructure, in a timely manner and to the satisfaction of Water NSW;

Development or Activities

- 48. The on-site supervisor must have in their possession a copy of this Consent, any environmental assessments, Statutory Approvals and associated Conditions of Approval, any related environmental management plan, the Safe Work Plan/ Risk Assessment and a copy of all licences, permits and other approvals that are required in relation to the Consent Holder's activities within the Controlled Area, available for reference purposes;
- 49. At all times, the Consent Holder and the on-site supervisor must ensure that the works undertaken by the Consent Holder, clients, contractors and sub-contractors in

the Controlled Area conforms to the Consent Holder's work proposal (as relevant), any relevant environmental assessments and Statutory Approvals (including Conditions of Approval), any related environmental management plan, the Safe Work Plan/ Risk Assessment, any licences, permits and other approvals granted in relation to the Consent Holder's activities within the Controlled Area, and this Consent;

50. All works must be undertaken in a manner that avoids any impact on Warragamba pipelines infrastructure and/or on water quality;
51. All imported fill material must be restricted to 'Virgin Excavated Natural Material' (VENM) that is not mixed with any other waste;
52. The Consent Holder must meet with the Water NSW principal contact (refer Condition 61) prior to completion of the work period to ensure that the site is decommissioned to the satisfaction of Water NSW. All refuse, debris and material associated with the work must be removed from the site and the site must be left in a satisfactory state;

Spill Management

53. Incident and spill management procedures must be immediately implemented if a spill occurs. All incidents must be immediately reported to the **Water NSW Incident Notification Number (1800 061 069)**;
54. In the event of spill the following procedure is to be followed (as a minimum):
 - a) Mechanical means is to be used to collect as much of the spilled material as possible and to apply an appropriate absorbent spill product to capture the balance.
 - b) Appropriate bunding or other physical measures are to be used to prevent spilt liquids and subsequent run off from entering the water storage.
 - c) Solvents and or water are not to be used to dilute the spill.
 - d) Materials used to collect or contain the spill are to be removed from the site;

Mechanical Provisions

55. Water NSW may vary the conditions of this Consent or revoke the Consent by notice in writing;
56. Water NSW may permanently or temporarily prevent or suspend entry to the Controlled Area under this Consent if Water NSW believes that the Consent Holder has:
 - a) defaulted on, or failed to comply with, any or all of the conditions of this Consent, or
 - b) has not acted in a responsible manner in discharging the conditions of this Consent;
57. This Consent cannot be transferred;

Release

58. The Consent Holder agrees to exercise the rights granted by Water NSW at the risk of the Consent Holder and to release to the full extent permitted by law, Water NSW, its employees, agents and contractors, in the absence of any negligence on their part from all suits, actions, demands and claims of every kind resulting from any damage or destruction to any property (both real and personal) and injury suffered or sustained by any persons (including death) arising out of or in connection with the purpose of this Consent;

Indemnity

59. The Consent Holder will, from the date of the Consent, indemnify and keep indemnified, Water NSW, its employees, agents and contractors in the absence of any negligence on their part from and against all its actions, demands, claims, proceedings, losses, damages, costs (including legal costs), charges or expenses incurred by Water NSW or for which Water NSW may become liable resulting from any damage or destruction to any property (both real and personal) and injury suffered or sustained by any persons arising out of or in connection with the purpose of this Consent;

Warranty

60. Water NSW provides no warranty that the Warragamba Pipeline Controlled Area land, catchment infrastructure works or water storages are suitable for activities under this Consent;

Principal Contact

61. Water NSW officer Mr Sean Johnston is the principal contact for the Warragamba Pipeline Controlled Area to arrange your Water NSW induction and entry. He can be contacted on 02 4774 4407 or 0457 519 385 and email sean.johnston@waternsw.com.au.

Any non-compliance with any of the conditions of this Consent, the *Water NSW Act 2014* or its Regulations may result in Water NSW taking action to address the non-compliance.

Penalty notice amounts for offences under the *Water NSW Act 2014* and Water NSW Regulation 2013 range from \$300 to \$750 for individuals, \$1000 to \$1500 for corporations and the maximum penalty that can be imposed by a court if the matter is prosecuted is \$22,000 for an individual and \$44,000 for a corporation.

If you have any questions in relation to this Consent, please contact Water NSW's Compliance Officer, Ms Amelia Stein on 02 4824 3409 or 0428 411 718 and email amelia.stein@waternsw.com.au.

Yours sincerely



Ivan Draper
Catchment Compliance Manager

31 October 2019

APPENDIX M

Soil and Water Management Plan

PROPOSED INDUSTRIAL DEVELOPMENT – WESTERN NORTH SOUTH LINK ROAD

SOIL & WATER MANAGEMENT PLAN

Sept. 2019 - Revision 4

Prepared for:



Prepared by:

ANDREW LITTLEWOOD

CPESC & Senior Soil Conservationist

Document Status

Rev No.	Date	Revision Description	Prepared by	Reviewed		Approved	
				Name	Date	Name	Date
0	18/06/2019	Revision 0	A Littlewood				
1	26/06/2019	Revision 1	A Littlewood	D Wonson	28/06/2019	M Dolan	28/06/2019
2	15/07/2019	Revision 2	M Dolan				
3	18/07/2019	Revision 3	M Dolan				
4	23/09/2019	Revision 4	T Dillon				

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Western North South Link Road – Soil and Water Management Plan

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1.0 INTRODUCTION

1.1 Context

This Soil and Water Management Plan (SWMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the construction of the Western North-South Link Road & Construction Access Road (the project) within the Proposed Industrial Development known as 'Oakdale West Estate' located at Erskine Park.

This SWMP is required to support the CEMP and has been prepared to address the requirements of NSW Roads & Maritime Services Quality Specification G36 Environmental Management, Quality Specification G38 Soil and Water Management, and the Project Environmental Impact Statement – November 2017.

1.2 Background

Goodman Group proposes to develop a 154-hectare tract of land that comprises of the combined parcels of land known as Lot 3031 DP 1168407, Lot 6 DP 229784, Lot 2 DP 84578, Lot 3 DP 85393, Lot 11 DP 1178389 off Bakers Lane, at Kemps Creek, extending to Lenore Drive, Erskine Park. The industrial development will entail the construction of 22 warehouse buildings providing 453,000 square metres of gross floor area and ancillary offices, built over five development stages including internal roads, drainage, landscaping and biodiversity offsets.

The EIS produced by Urbis assessed impacts of the project on surface water and soils. The EIS noted at Section 2.1 & 2.3 that; *'Landform is relatively uniform, with undulating rises and alluvial flats bisected by narrow, ridge running from the south-west to the north-east of the site'*. Our site inspection confirmed the undulating nature of the topography, with localised steep gradients in the western area that would present a moderate risk of increased sediment and contaminant impacts on water quality of local waterways due to runoff from the Project.

The EIS concluded potential impacts would be minimised through the employment of safeguards and management measures stated in Section 7.1 of the REF.

1.3 Environmental management systems overview

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

The SWMP is part of Robson Civil Projects Pty Ltd's (Robson) environmental management framework for the project, as described in Section 3 of the CEMP. Management measures identified in this Plan will be incorporated into site or activity specific Environmental Work Method Statements (EWMS).

EWMS will be developed and signed off by environment and management representatives prior to associated works. Construction personnel will be required to undertake works in accordance with the identified mitigation and management measures. Works that are proposed in or near to identified Environmentally Sensitive Areas will have an EWMS prepared that details relevant environmental protection measures.

The Progressive Erosion and Sediment Control Plans (PESCPs) will be prepared in consideration of the Primary Erosion and Sediment Control Plan (Appendix A), which describes the intentions and fundamental principles for erosion and sediment control management for the duration of the entire project.

The PESCPs will be developed by the Project environmental team in consultation with construction personnel, and with the assistance of the Project Soil Conservationist (CPESC) when required.

They will be developed prior to any construction works commencing in each work zone and will be modified as required when:

Western North South Link Road – Soil and Water Management Plan

- Site conditions evolve.
- Flow paths change.
- Construction activities that affect the characteristics of ground conditions change.

A Project Soil Conservationist will be engaged and consulted throughout construction to provide advice on erosion and sediment control design, installation, maintenance and the development of PESCPs.

Used together, the CEMP, strategies, procedures, EWMS and PESCP form management guides that clearly identify required environmental management actions for reference by Robson personnel and contractors.

The review and document control processes for this Plan are described in Section 6 of the CEMP.

2.0 PURPOSE & OBJECTIVES

2.1 Purpose

The purpose of this Plan is to describe how Robson proposes to manage and minimise soil and water impacts during construction of the project.

2.2 Objectives

The key objective of the SWMP is to ensure that the potential impacts to soil and water quality are minimised. To achieve this objective, Robson will undertake the following:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise erosion and sedimentation impacts and potential impacts to water quality in creeks, waterways and groundwater along the project corridor.
- Ensure appropriate measures are implemented to address the RMS G36 & G38 specification requirements and the relevant mitigation measures detailed in the EIS.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 3.1 of this Plan.

2.3 Targets

The following targets have been established for the management of soil and water impacts during the project:

- Ensure compliance with the relevant legislative requirements and environmental safeguards.
- Meet RMS G38 specification requirements for water quality discharge parameters for all planned basin discharges.
- Manage downstream water quality impacts attributable to the project (i.e. maintain waterway health by avoiding the introduction of nutrients, sediment and chemicals (outside of that permitted by the ANZECC guidelines).
- Ensure training on soil and water management is provided to all construction personnel through targeted training, site inductions and toolbox talks.

3.0 ENVIRONMENTAL REQUIREMENTS

3.1 Relevant legislation and guidelines

3.1.1 Legislation

Legislation and regulations relevant to soil and water management includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act).
- *Environmental Planning and Assessment Regulation 2000*.
- *Protection of the Environment Operations Act 1997* (POEO Act).
- *Water Management Act 2000*.
- *Fisheries Management Act 1994*.
- *Water Act 1912*.

Section 120 of the POEO Act states that it is illegal to pollute waters. Under the POEO Act, 'water pollution' includes introducing litter, sediment, oil, grease, wash water, debris, and flammable liquids such as paint etc. into waters or placing such material where it is likely to be washed or blown into waters or the stormwater system or percolate into groundwater. All practicable steps should be taken to minimise the risk of pollution of waters.

3.1.2 Conditions

This SWMP has been prepared to accompany the Construction Environmental Management Plan (CEMP) for the WNSLR. The conditions relevant to this SWMP are outlined in the following sections.

3.1.2.1 DEVELOPMENT CONSENT

Conditions for Oakdale West and the WNSLR are specified in Department of Planning and Environment (DPE) Development Consent SSD 7348, dated **13/09/2019**. The conditions relevant to this SWMP are reproduced in Table 1.

Table 1 - Development Consent Conditions

Development Consent Conditions	Section / Comment
D80. The Applicant must prepare Erosion and Sediment Control Plans for Stage 1, including the WNSLR, to the satisfaction of the Planning Secretary. The Plans must form part of a CEMP in accordance with Condition D119 and must: (a) Be prepared by a suitably qualified and experienced person(s); (b) Be generally consistent with the Erosion and Sediment Control Plans in the RTS and those prepared by the contractor for each sequence of the works, as approved by the PCA; (c) Include detailed erosion and sediment controls developed in accordance with the relevant requirements of Managing Urban Stormwater: Soils and Construction – Volume 1: Blue Book (Landcom, 2004) guideline; and (d) Include procedures for maintaining erosion and sediment controls in efficient working order for the duration of construction, to ensure Stage 1 complies with Condition D82.	Appendix A Prepared by Rubicon Environmental Pty Ltd
D81. Prior to the commencement of bulk earthworks as part of Stage 1, the Applicant must implement erosion and sediment controls identified by Condition D80 and maintain those controls throughout bulk earthworks and	Appendix A

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Development Consent Conditions	Section / Comment
construction, to ensure stormwater flows do not increase in any downstream areas. The Environmental Representative, appointed in accordance with Condition D123, shall make a written statement to the Planning Secretary confirming the erosion and sediment controls are operational, prior to the commencement of bulk earthworks and other construction activities required for Stage 1.	
D82. Stage 1 must comply with section 120 of the POEO Act, which prohibits the pollution of waters.	Section 7.4
D86. If groundwater is intersected during construction of Stage 1, the Applicant must: <ul style="list-style-type: none"> (a) Obtain the necessary water licence or approvals from NRAR; and (b) Develop a Groundwater Management Plan (GMP) for the testing, dewatering, storage, movement and treatment of groundwater, to the satisfaction of NRAR. 	Section 4.5

3.1.2.2 ROADS AND MARITIME QA SPECIFICATION

Additional requirements for the project are detailed in Roads and Maritime Services (Roads and Maritime) QA Specification G38, dated November 2018. The requirements relevant to this SWMP are reproduced in Table 2.

Table 2 - QA Specification G38 Conditions

G38 Conditions	Section / Comment
2.1. Soil and Water Management Plan	
2.1.1 General	
If specified in Annexure G38/A, prepare a Soil and Water Management Plan (SWMP) for the Work Under the Contract. The SWMP will form part of the Contractor's Environmental Management Plan (CEMP) specified in G36, and incorporates the Erosion and Sediment Control Plan (ESCP) (refer Clause 2.2).	This document
The SWMP must be prepared by a person who has completed training course in Blue Books 1 & 2D and has demonstrated skills and experience in preparing the SWMP in accordance with the guidelines in the publication "Managing Urban Stormwater: Soils and Construction Volumes 1 and 2d" (the Blue Book)	Prepared by Rubicon Environmental Pty Ltd
2.1.2 Plan Requirements	
The SWMP must include details of the following, where relevant	
(a) Purpose and objectives of SWMP.	Section 2
(b) Approvals, licence requirements and relevant legislation	Section 3 & 7.4
(c) Site investigation and assessment of the following:	Section 4
i. Soil properties (including dispersion properties and presence of acid sulphate soils);	
ii. Rainfall records and design parameters;	
iii. Waterways and other water related sensitive environments;	
iv. Groundwater;	
v. Possibilities of, and limitations on, water extraction.	
(d) Environmental control measures, including:	Section 6

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G38 Conditions	Section / Comment
<ul style="list-style-type: none"> i. Responsibility for its implementation, including the names and contact details of the person(s) responsible; ii. Resources required for its construction, monitoring, maintenance and removal; iii. Implementation schedule for the measures, related to construction activities; iv. Monitoring and maintenance of the environmental controls. 	Section 1.3
(e) Other associated plans, Environmental Work Method Statements (EWMS) and procedures	Appendix A
<ul style="list-style-type: none"> (f) Construction sediment retention basins, including details of the following: <ul style="list-style-type: none"> i. Design of the construction sediment retention basins, including any temporary modifications to the operational basins, providing details of the approach, standards, criteria and references used in the design of the basins; ii. Management of the basins; iii. Procedures for testing, treatment and discharge of water from the basins; iv. Procedures for the periodic removal and disposal of the sediment collected within the basins. 	Section 7.2
<ul style="list-style-type: none"> (g) Training including: <ul style="list-style-type: none"> i. Site induction; ii. Environmental training; iii. Toolbox training. 	Section 7.3 & 7.6
(h) Inspection and auditing;	
(i) Identification of site catchments, basins and sub-catchments, high-risk areas and sensitive areas;	Appendix A
(j) The likely volume of run-off from each catchment and sub-catchment in accordance with the Managing Urban Stormwater: Soils and Construction, Volume 1 and 2 (Landcom, 2004);	Appendix A
(k) Direction and separation of water flow, both off and on site;	Appendix A
(l) The locations and sizing of sediment basins or sumps and associated catch drains, catchments and/or bunds;	Appendix A
(m) A mapped plan identifying the above at all major construction stages;	Appendix A
(n) Progressive and site specific Erosion and Sediment Control Plans;	Appendix A
(o) A process for monitoring and Bureau of Meteorology weather forecast for the area;	Appendix A
(p) Preparation of a wet weather (rain event) plan which includes a process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather;	Appendix A
(q) Identify construction areas with a potential sediment load greater than 150m ³ per year;	Appendix A
(r) A contingency plan for any acid sulphate soils or salinity identified; and	Section 4.2 Appendix A
(s) Procedures for ensuring implementation of general erosion, sediment and water quality control safeguards, any sediment basins, stockpiles, washdowns, batch plants, refueling and chemical storage sites must be lined and/or bunded if they are located within 50 metres of a shallow groundwater source;	Appendix A

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G38 Conditions	Section / Comment
<p>(t) A dewatering procedure for on-site water and basins;</p> <p>(u) A review process by your soil conservationist and a process for updating the report to address any recommendations; and</p> <p>(v) Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls.</p>	<p>Section 1.3</p> <p>Section 7.3</p>
2.2 Erosion and Sediment Control Plans	
2.2.1 General	
<p>Prepare an Erosion and Sediment Control Plan (ESCP) for the Work Under the Contract. The ESCP will form part of the CEMP, and where a SWMP is also required, the ESCP will be incorporated in the SWMP.</p> <p>The ESCP must be prepared by a person who has completed a training in Erosion and Sediment Control (with a certificate as proof of training) with demonstrated skills and experience in preparing the ESCP in accordance with the Blue Book guidelines.</p> <p>Key personnel who control construction work at each worksite must also have completed a training course in Erosion and Sediment Control.</p>	<p>Appendix A</p> <p>Prepared by Rubicon Environmental Pty Ltd</p>
2.2.2 Plan Requirements	
<p>The ESCP must include details of the following where relevant:</p> <ul style="list-style-type: none"> (a) Erosion and sediment control measures required; <ul style="list-style-type: none"> i. Before clearing and grubbing of the Site; ii. Before removal of topsoil and commencement of earthworks within the catchment area; (b) How upstream water will be managed so it is not polluted by the construction activities; (c) Method of tree removal in intermittent watercourses, leaving grasses and small understorey species undisturbed wherever possible; (d) Scour protection measures for haul roads and access tracks when these are an erosion hazard due to either their steepness, soil erodibility or potential for concentrating runoff flow; (e) Measures for stabilizing temporary drains; (f) Measures to minimize erosion during construction of embankments; (g) Measures to minimize erosion and control sedimentation from stockpiles; (h) Methods of constructing batters to assist the retention of topsoil on the batter slopes; (i) Measures to temporarily trap sediment in median areas at regular intervals; (j) Controls in runoff flow paths to reduce flow velocities and minimize the potential for erosion; (k) Measures for controlling waste water discharge on or around the Site from dewatering, surface washing, grit blasting, saw cutting, drilling, washing vehicles and plant and any other activities which add pollutants to water; (l) Measures to be put in place during an extended shut-down of the Site or when rainfall above a certain trigger level is predicted; (m) Maintenance of erosion and sediment control structures including measures to restore this capacity; 	<p>Appendix A</p>

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G38 Conditions	Section / Comment
<p>(n) Inspection and auditing program for all erosion and sediment controls to ensure that no disturbed area is left without adequate erosion and sediment controls;</p> <p>(o) Measures to minimize sediment moving off-site and sediment laden water entering any water course, drainage lines or drainage inlets;</p> <p>(p) Divert off site water around the site;</p> <p>(q) Provision of hardstand material or rumble grids at exit points from stockpile sites and construction areas onto public roads to minimize the tracking of soil and particulates onto public roads;</p> <p>(r) The direction of run-off and drainage points during each stage of construction; and</p> <p>(s) Control measures to be implemented in wet weather events, including a mapped plan.</p>	
<p>2.3 Water Quality Monitoring Program</p> <p>If specified in Annexure G38/A, prepare a Water Quality Monitoring Program (WQMP), as a supplement to the ESCP, in accordance with the RMS Guideline for Construction Water Quality Monitoring and EPA publication “Approved Methods for the Sampling and Analysis of Water Pollutants in NSW”.</p> <p>Include the following in the WQMP:</p> <ul style="list-style-type: none"> (a) Objectives of the monitoring (including EPA licence requirements); (b) Map showing the water sampling locations; (c) Sampling protocol, including sample collection, chain of custody information and sample preservation; (d) Parameters to be monitored; (e) Method for interpretation of field results and identifying exceedance of water quality criteria; (f) Accountabilities, responsibilities and training required to meet the monitoring objectives; (g) Method of comparison of results between sampling locations (e.g. upstream and downstream) and any water quality criteria and/or targets; (h) Responsibility for planning, implementing, checking and reviewing each element of the monitoring; (i) Methodology for using monitoring results to assess and manage identified problems; (j) Reporting requirements in the case the monitoring results exceed the set criteria. <p>Laboratories used in the monitoring program must be accredited by the National Association of Testing Authorities (NATA).</p>	
<p>Appendix B</p>	

3.1.3. Guidelines and standards

The main guidelines, specifications and policy documents relevant to this Plan include:

- RMS QA Specification G36 – Environmental Protection (Management System).
- RMS QA Specification G38 – Soil and Water Management.
- Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (EPA, March 2004).

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- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000).
- Department of Environment and Conservation (DEC): Bunding & Spill Management. Insert to the Environment Protection Manual for Authorised Officers - Technical section "Bu" November 1997.
- Managing Urban Stormwater: Soils and Construction. Landcom, (4th Edition) March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2.
- Volume 2A Installation of Services (DECCW 2008).
- Volume 2D Main Roads Construction (DECCW 2008).
- Water quality guidelines for the protection of aquatic ecosystems for lowland rivers and estuaries. (ANZECC, 2000).
- Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries, Cronulla, 16 pp.
- NSW Fisheries, November 2003. Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings (Ref: NSWF – 1181).
- RMS Technical Guideline - Stockpile Site Management Guideline (2011).
- RMS Technical Guideline EMS-TG-011: Environmental Management of Construction Site Dewatering (2011).
- RMS Technical Guideline (11-068) – Temporary Stormwater Drainage for Road Construction (2011).
- RMS Code of Practice for Water Management, the RMS Erosion and Sedimentation Procedure (1999).
- RMS Code of Practice for Water Management.
- RTA's Environmental Direction No.19 - Use of Reclaimed Water (2006).
- RTA's Environment Direction No.25 - Management of Tannins from Vegetation Mulch (2012).
- RMS Guideline for Construction Water Quality Monitoring.
- RTA's Stockpile Management Procedures (2011).
- Roads and Maritime Stockpile Management Guidelines (RMS, 2015)
- RMS Guideline for Batter Surface Stabilisation Using Vegetation (2015)

3.2 Environmental management measures

Environmental safeguards and management measures are included in the EIS in Section 6. The environmental management measures relevant to this Plan are listed Table 3 below. This includes reference to required outcomes, the timing of when the commitment applies and the section of this Plan or other management system document which addresses the requirement.

Table 3 - Management measures from the EIS relevant to construction soil and water management

Issue	SSDA Component	Mitigation & Management
General Construction Management	Stage 1 Development	<ul style="list-style-type: none"> • A CEMP to be prepared for the OWE Stage 1 Development capturing standard and specific management and mitigation measures as described in the SSDA, EIS and supporting technical documents.
Soils	Stage 1 Development	<ul style="list-style-type: none"> • Mitigation measures inherent to the civil design of the proposal.

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Issue	SSDA Component	Mitigation & Management
		<ul style="list-style-type: none"> Sedimentation and erosion control measures are proposed as detailed in Appendix E and J (EIS).
Contaminated land	Stage 1 Development	<ul style="list-style-type: none"> Identified areas of potential contamination to be subject to further investigation prior to the development of affected land.
Earthworks	Stage 1 Development	<ul style="list-style-type: none"> Civil design achieves appropriate site levels with minimal impact upon hydrology. Import of fill to be managed in accordance with CEMP. Erosion and sediment controls included in SSDA package (Appendix E).
Groundwater	Stage 1 Development	<ul style="list-style-type: none"> Methods and management of any required dewatering required during construction works to be detailed in the CEMP.
Water Quality	Stage 1 Development	<ul style="list-style-type: none"> Erosion and sediment controls as detailed in Appendix E and Appendix J to be implemented through CEMP. Stormwater to be treated to compliant levels prior to discharge.
Air Quality and Odour - Construction	Stage 1 Development	<p>CEMP to include standard air quality control measures, contingency plans and response procedures and suitable reporting and performance monitoring procedures.</p> <p>CEMP to include standard odour mitigation measures for construction including keeping excavation surfaces moist, covering excavation faces and/or stockpiles, use of soil vapour extraction systems and regular monitoring of discharges as appropriate.</p>

4.0 EXISTING ENVIRONMENT

The following sections summarise what is known about factors influencing soils and water quality within and adjacent to the project corridor. The key references in the Project EIS documents are Section 6.7 – Other Issues.

4.1 Topography and soil characteristics

Section 2.3 of the Project EIS describes the topography and geology of the Project area as follows;

- “Landform is relatively uniform, with undulating rises and alluvial flats bisected by narrow, ridge running from the south-west to the north-east of the site. No significant height variances with elevations from approximately 92m above AHD to approximately 50m at Ropes Creek in the east of the site.*
- “Underlying geology of the site is the Wiananmatta Group formation (Bringelly Shale) and alluvium associated with Ropes Creek. Surface and sub-surface conditions are as follows:*
 - Topsoil: Clay, depth 0.0-0.04 m;*
 - Natural Soil: Clay, depth 0.04-0.5 m;*
 - Bedrock: Sandstone, Sandstone and shale, depth 0.7-5.0 m.’*
- “Residual soils, characteristic of the Blacktown soil landscape, generally consist of shallow duplex soils over a clay base (OEH 2014)”*
- “Overlying fluvial soils, part of the South Creek soil landscape, are associated with the alluvium across the low-lying terrain bordering Ropes Creek.”*

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- *“No acid sulphate soils have been identified”*

The predominant soil landscape characteristics are described in general terms in the REF, however, further reference to NSW Office of Environment & Heritage website resource ‘eSPADE’, identified the presence of two soil landscape units within the project footprint:

- the ‘Blacktown’ (bt) soil landscape unit, which encompasses the majority of the Project from the northern extent to the areas of higher elevation in the south of the Project,
- the ‘Luddenham’ (lu) soil landscape unit, which encompasses the steeper, southern portion of the Project.

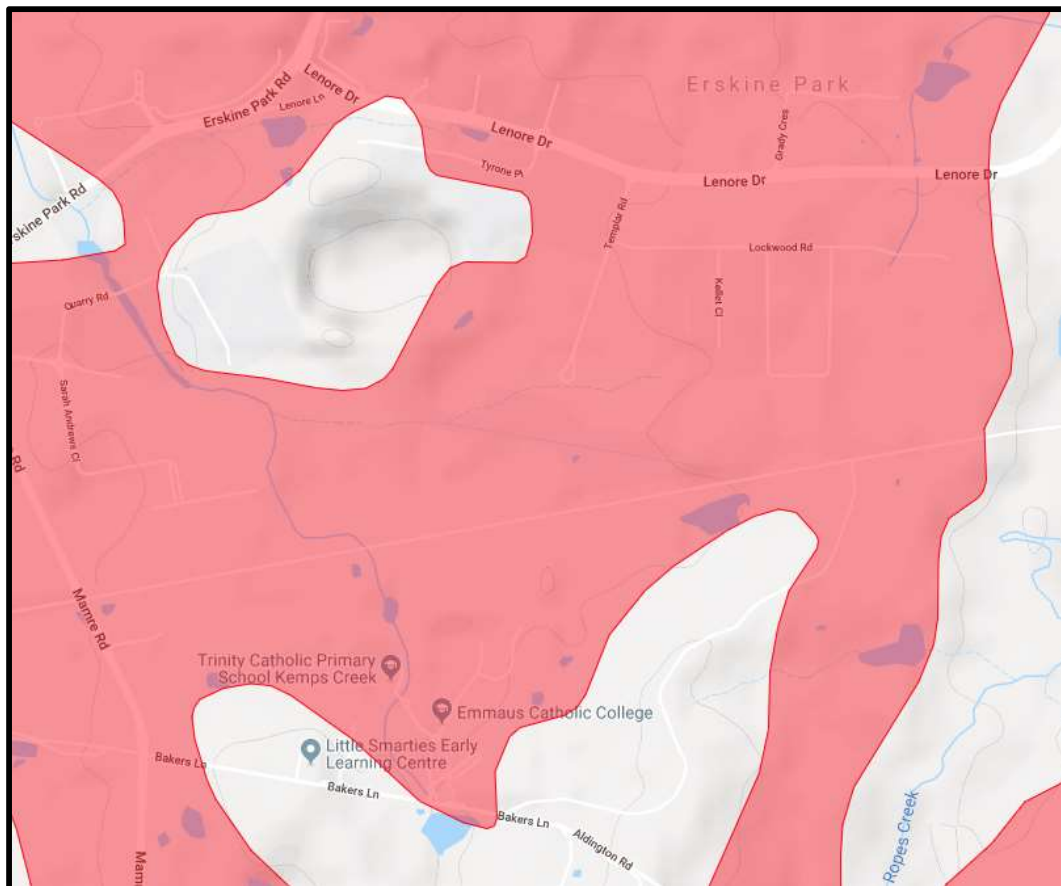
4.1.1. ‘Blacktown’ (bt) landscape unit

The ‘Blacktown’ landscape unit is the predominant soil landscape in the western Sydney area. The soil landscape occurs over the Wianamatta Group and Ashfield Shale which consists of laminite and dark grey siltstone, Bringelly Shale which consists of shale with occasional calcareous claystone, laminite and infrequent coal, and Minchinbury Sandstone consisting of fine to medium-grained quartz lithic sandstone.

The soils are characterised by Red and Brown Podzolic soils on mid to upper slopes grading to Yellow Podzolic soils on lower slopes and drainage lines.

The erosion hazard of the varying soil types is rated as Slight to Moderate for non-concentrated flows, ranging to Moderate to High for concentrated flows. Other physical limitations of the landscape unit include hard setting soil profiles, moderately reactive deep clays and High shrink-swell potential (localised). The chemical soil characteristics include generally acidic soils (pH commonly ranging from 5.0 – 7.0), low to moderate fertility, and localised sub-soil salinity.

Figure 1 – Extract map of the occurrence of the ‘Blacktown’ (bt) soil landscape unit

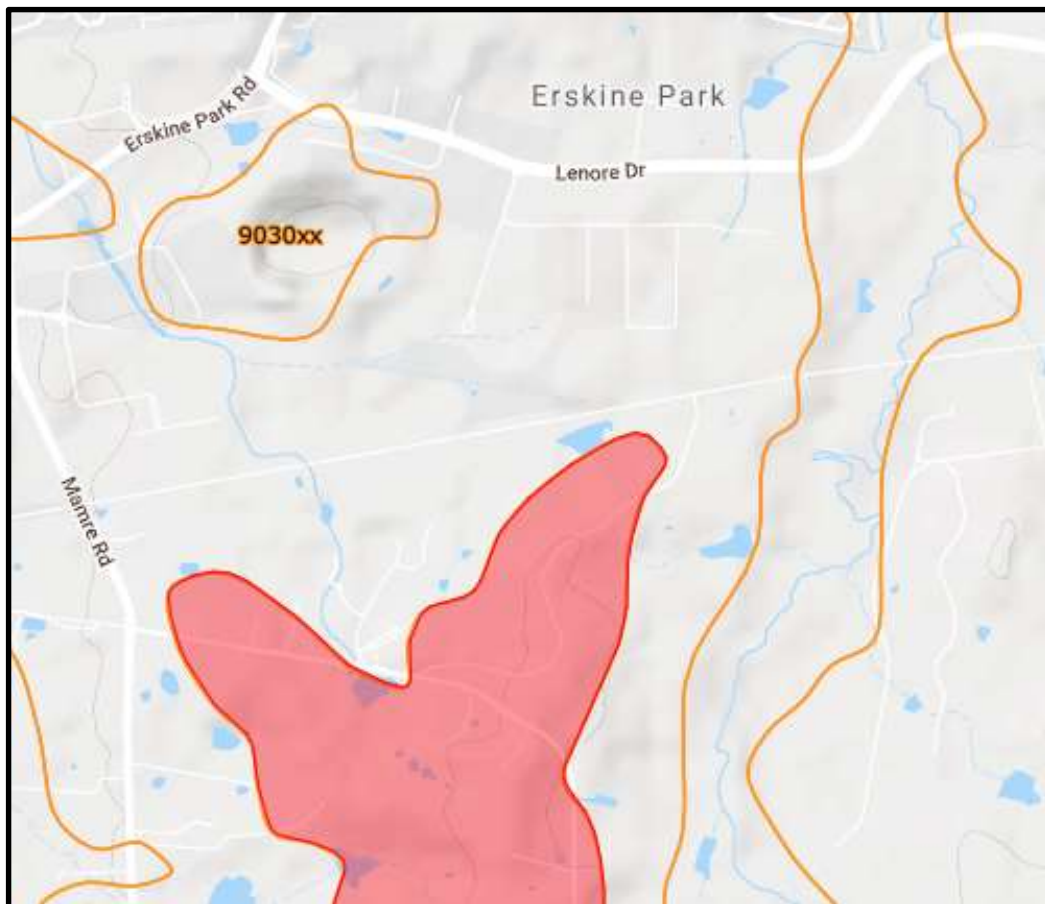


4.1.2. ‘Luddenham’ (lu) landscape unit

The ‘Luddenham’ (lu) soil landscape unit mainly occurs in the south and west in the Cumberland Lowland on the lesser isolated ridgelines. This soil landscape is also underlain by Wianamatta Group, Ashfield Shale and Bringelly Shale formations. The Ashfield Shale consists of laminite and dark grey shale. Bringelly Shale consists of shale, calcareous claystone, and laminite. Between these two shale members is the Minchinbury Sandstone consisting of fine to medium-grained lithic quartz sandstone. This soil landscape occurs on low rolling to steep low hills with slopes ranging from 5-20% grade. The main soils are shallow dark podzolic or massive earthy clays on crests and upper slopes loams ranging to Yellow Podzolic soils and prairie soils on lower slopes and drainage lines.

The erosion hazard of the soil type is rated as Moderate to Very High for non-concentrated flows and High to Very High for concentrated flows. Other physical limitations of the landscape unit include hard setting soil profiles, low wet strength, high shrink swell, mass movement hazard and moderately reactive soil materials. The chemical soil characteristics range from Strongly Acidic to Slightly Acidic (pH commonly ranging from 4.0 – 6.5), low fertility, and generally low available water capacity.

Figure 2 – Extract map of the occurrence of the ‘Luddenham’ (lu) soil landscape unit



4.2 Acid Sulphate Soils

Potential Acid Sulfate Soils are soils that have concentrations of iron sulphide layers that can oxidise when exposed to oxygen generating sulphuric acid. In general, these soils occur less than 5 metres elevation above sea level and are predominantly restricted to low-lying coastal areas, adjoining estuarine areas. More recently, acid sulphate soils have been identified in long-term, drought-affected inland areas where water levels have dropped in waterways and wetlands, exposing acid sulphate material that has subsequently oxidised.

Given the general elevation and the soil types described within the Project area, acid sulphate soils are unlikely to occur in the area. A review of the relevant Acid Sulfate Soil Risk Map (ASSMAC – DLWC 1998) confirmed the Project area falls outside the study area of this resource.

Further reference to the online soil mapping resource ‘eSpade’ (NSW Department of Environment & Heritage) indicate that the site is not situated in an area at risk of Acid Sulphate soils. The map indicates the closest known occurrence is in the upper reaches of the Parramatta River and Georges River to the east and south east of the Project.

4.3 Surface water

The Project traverses a dissected ridge with a general north-south alignment. The drainage pattern is ephemeral with runoff generated in response to prolonged rainfall or storm events. The catchments on the eastern side of the ridgeline generally drain toward Ropes Creek, whilst the smaller catchment on the western slopes generally drain toward the upper tributaries of South Creek.

Section 2.3 of the EIS describes the Surface Water and Hydrology as follows;

- *“The OWE is located within the Hawkesbury-Nepean catchment.*
- *Ropes Creek, a third order stream, flows along the eastern boundary of the site in a northerly direction into South/Wianamatta Creek approximately 13 km north of the OWE.*
- *The landscape is characterised by a series of ridgelines incised with drainage lines flowing into Ropes Creek. The drainage system within the development site is in relatively poor condition, due to erosion and trampling by cattle.*
- *An unnamed modified watercourse is to the west of the OWE.*
- *The eastern portion of the site is subject to flooding (associated with Ropes Creek) and is variably affected by the 100-year average recurrence interval (ARI) flood event.*
- *Two small farm dams are located on the western boundary of the site, while two larger dams and one smaller dam are located on the eastern and northern portions of the site.”*

4.4 Water Quality and Receiving Environment Assessment

The Project activities that have the potential risk of negative impacts on water quality parameters include:

- Vegetation clearing & establishing initial access to site areas.
- Establishing ‘clean’ water diversions and erosion and sediment controls.
- Topsoil stripping.
- Ancillary site preparation and operation.
- Haul road establishment, temporary access tracks & temporary haul crossing over drainage lines.
- Service relocation.

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- Excavation of cuttings, bulk earthworks, and fill placement.
- Pavement demolition & removal.
- In-situ concrete works and concrete curing.
- Culvert construction and minor watercourse stabilisation.
- Dewatering 'dirty' water from site areas and sediment basin operations.
- Spills & leaks of fuels & oils from mobile and static machinery.
- Storage of chemicals, fuels & oils.
- Generation of building and construction waste.
- Importing, handling, stockpiling and transporting materials & resources.
- Plant maintenance.
- General waste generation from compound/s & works areas.

The assessment of the existing water quality attributes of the Project catchments noted that vegetation across the Project has been heavily modified for agricultural purposes that would generally be limited to grazing. A remnant native vegetation structure is only present in a few isolated areas, generally confined to the steeper slopes and adjacent to drainage lines. All drainage lines are almost devoid of riparian vegetation over their length and the contributing catchments have been under scrubbed of low to mid storey native vegetation for the purposes of agriculture.

In general terms, water quality in the area is likely to be typical of aquatic ecosystems that have been disturbed by agricultural practices. Long term agricultural land use has given rise to surface water pollution which would likely exceed the levels considered to be suitable for the sustainability of ecosystem integrity. The existing land does not have water quality treatment measures in place as part of the drainage infrastructure.

The determination of the assessment of the drainage patterns, the heavily modified existing receiving environments, and the attributes of the receiving waters in the vicinity of the Project have been assessed as 'standard' in accordance with Blue Book Volume 1- Sect. 6.3.4 – (f) & Volume 2D – Table 6.1.

4.5 Groundwater

The presence of groundwater primarily impacts on erosion and sediment control during construction with regard to piling, foundation earthworks, trenching for drainage and services, culvert construction, and sediment basin construction. The Project EIS at Section 2.3 describes the groundwater characteristics of the Project area as follows;

"Groundwater is expected to be relatively deep below the OWE site – no groundwater was encountered during geotechnical investigations which included boreholes drilled up to 15m below ground level."

There are no obvious indicators of shallow groundwater sources, however the detectable presence of groundwater at or near the soil surface is highly dependent on seasonality and rainfall rates. Further assessment was undertaken the NSW Groundwater Bore Database (Department of Primary Industries – Water 2018).

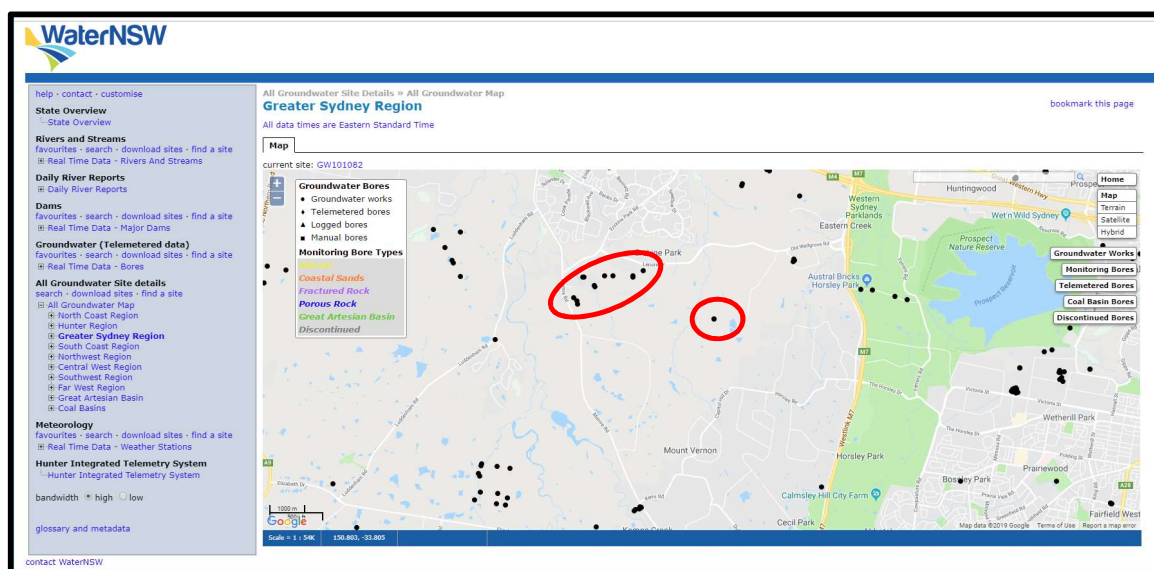
The database was reviewed for information on existing groundwater bores in a three-kilometre radius of the Project area. Thirteen (13) groundwater sites were located in close proximity to the Project. Groundwater drill records for several sites were reviewed with final bore depths commonly being 50-60m below ground level. Groundwater table depths were not indicated.

In summary, the assessment indicates that groundwater is not likely to impact on the scope of the Project works.

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Figure 3 – Extract map of the occurrence of groundwater bores in the Project vicinity.

(Note the nearest groundwater bores indicated are circled in red)



4.6 Rainfall

Rainfall data was assessed from the Sydney Equestrian Centre Automatic Weather Station (AWS), located approximately 5 kilometres south-east of the Project. This data was recorded between 1997 to present day. (Bureau of Meteorology, 2019). The Sydney Equestrian Centre AWS was also selected for the Project as it will provide real time weather monitoring during the proposed construction period.

Rainfall data collected shows that typically rainfall is higher during summer and autumn. Winter and spring are generally drier periods during the year. February is the wettest month, with an average rainfall of 103.6 millimetres. Both the mean and median average annual rainfall totals are closely correlated at 757.3mm and 715.8 millimetres respectively.

Table 4 below provides a summary of climate data at the weather station.

Table 4 – Summary of rainfall records

Summary of climate records from 1997 - 2019													
Summer		Autumn			Winter			Spring			Summer		
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Year
Mean rainfall (mm)	75.6	103.6	83.3	70.3	41.9	75.7	35.7	37.6	35.1	58.8	78.6	66.4	757.3
Median rainfall (mm)	68.4	89.5	57.3	58.5	19.1	52.2	26.0	26.6	22.2	48.7	57.9	62.6	715.8
Mean of rain days >1mm	7.6	7.1	8.0	6.8	5.0	6.5	5.1	4.2	4.9	5.8	7.0	7.1	75.1

Red = highest value blue = lowest value

4.7 Rainfall erosivity factor and design rainfall depth

The rainfall erosivity factor is a measure of the ability of rainfall to cause erosion (referred to as “R” in the Revised Universal Soil Loss Equation - RUSLE). The rainfall erosivity factor is used to determine the soil loss in tonnes per hectare over one year, and is used in calculations when sizing construction sediment basins.

The rainfall erosivity factor which is referred to as the ‘R’ Factor has been assessed from an Intensity Frequency Duration Table (see below) prepared for the site based on the 2-year, 6 hours storm event of 10.0mm/hour. The R Factor value of 2210 is calculated from the 2-year ARI, 6 Hour storm of 10.0mm/hour being ‘S’, where $R = 164.74(1.1177)^S S^{0.6444}$, as per the Blue Book - Appendix A2 & B.

The nearest ‘Blue Book’ centre for detailed rainfall depths is Blacktown which is approximately 11kms north-east of The Project (Blue Book Volume 1- Table 6.3a). As noted above at Section 4.3, the Project was assessed as ‘standard’ in accordance with Blue Book Volume 1- Sect. 6.3.4 – (f) & Volume 2D – Table 6.1, however, we have elected to adopt the 5-day 85th percentile rainfall depth for Blacktown of 32.2mm, given the anticipated duration of the construction of the surrounding staged developments.

Table 5 – Intensity Frequency & Duration Table

Intensity-Frequency-Duration Table							
Location: 33.825S 150.800E NEAR.. Oaklands West Issued: 6/6/2019							
Rainfall intensity in mm/h for various durations and Average Recurrence Interval							
Average Recurrence Interval							
Duration	1 YEAR	2 YEARS	5 YEARS	10 YEARS	20 YEARS	50 YEARS	100 YEARS
5Mins	76.6	98.7	127	144	166	195	217
6Mins	71.7	92.4	119	135	156	183	204
10Mins	58.6	75.5	97.5	110	127	149	166
20Mins	42.7	55.0	70.8	80.0	92.1	108	120
30Mins	34.6	44.6	57.4	64.8	74.6	87.5	97.3
1Hr	23.4	30.2	38.9	43.9	50.5	59.2	65.8
2Hrs	15.4	19.9	25.5	28.8	33.2	38.9	43.2
3Hrs	12.0	15.4	19.8	22.4	25.7	30.1	33.5
6Hrs	7.78	10.0	12.8	14.5	16.7	19.5	21.7
12Hrs	5.03	6.48	8.35	9.44	10.9	12.8	14.2
24Hrs	3.22	4.17	5.45	6.21	7.20	8.50	9.50
48Hrs	1.99	2.60	3.48	4.02	4.70	5.61	6.33
72Hrs	1.46	1.92	2.60	3.02	3.55	4.27	4.83
(Raw data: 30.31, 6.5, 1.92, 59.07, 12.68, 4.26, skew=0.01, F2=4.3, F50=15.8)				© Australian Government, Bureau of Meteorology			

4.8 Flooding

The Project EIS includes a Flood Impact Assessment at Appendix P, detailing the flooding risks and characteristics of the Project area.

5 ENVIRONMENTAL ASPECTS AND IMPACTS

5.1 Construction activities

Key aspects of the project that could result in adverse impacts to soils and water include:

- Installation of preliminary erosion and sediment controls and establishment of off-site water diversions
- Establishment of compounds, exclusion zones, stockpile and ancillary areas, and contaminated soils treatment area/s
- Vegetation clearing and grubbing and topsoil stripping.
- Bulk earthworks including excavation and cuttings.
- Relocation of services/utilities.
- Construction of internal haulage and access routes.
- Site access including temporary waterway crossings.
- Bridge construction, including abutments and installation of piers.
- Culvert and drainage works, including permanent sediment basins and swales.
- Batter treatments.
- Material stockpiles.
- Crushing and/or soil handling operations.
- Paving activities.
- Water use/extraction.
- Compound operation including fuel and chemical storage, refuelling and chemical handling.
- Noxious weed treatment including herbicide spraying.
- Topsoil replacement, revegetation, and landscaping
- Landscaping.

5.2 Impacts

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

- Exposure of soils during vegetation clearing and earthworks, creating the potential for off-site transport of eroded sediments and pollutants.
- Production of tannins from mulch during clearing.
- Alteration of surface and subsurface flows that could cause disturbances to hydrology and hydraulics.
- Intercepting with cuts perched water tables or layers of relatively low permeability soil/rock.
- Off-site discharge of water containing sediment from dewatering activities.
- Contamination of soils, and surface and groundwater from accidental spills or oil leaks. This might include grease or fuel from machinery and vehicles, construction sites or compounds, or spills of other chemicals that may be used during the course of construction.
- Disturbance of unidentified contaminated land e.g. pesticide/chemical concentrations in soil from historical land use practices, and subsequent generation of contaminated runoff.

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- Litter and gross pollutants from construction activities.
- Erosion and sedimentation of active construction zones during construction of the project as a result of a large rainfall event or storm event.

Some impacts on soil and water attributable to the Project are anticipated. Documents and control measures to mitigate these impacts are detailed in Section 4.6 of the CEMP.

A full list of management measures associated with soil and water are detailed in Section 6 of this Plan below.

6 ENVIRONMENTAL CONTROL MEASURES

Specific measures and requirements to address soil and water management are outlined in in Table 6.

Table 6 – Management and mitigation measures

ID	Measure / Requirement	When to implement	Responsibility	Reference
General				
SW1	Training will be provided to all project personnel, including relevant sub-contractors on sound erosion and sediment control practices and the requirements from this plan through inductions, toolboxes and pre-start briefings.	Pre-construction Construction	Project Manager / Environmental Site Representative	G36 Clause 3.5, G38 Clause 2.2.1.
SW2	A Project Soil Conservationist (CPESC) will be engaged and consulted throughout construction to provide advice and review SWMP preparation, erosion and sediment control design, installation, maintenance and the development of PESCPs.	Pre-construction Construction	Project Manager / Environmental Site Representative	G38 Clause 2.1.2 & 4
SW3	EWMSs will be prepared and implemented to manage soil and water impacts that include but are not limited to: <ul style="list-style-type: none"> Activities assessed as having high environmental risk (refer G36 - Clause 3.2.1); Activities that impact on environmentally sensitive areas (refer Clause G36-4.13); Activities that pose a risk to receiving water quality; Activities that generate high levels of noise and/or vibration (where there are nearby receptors) Clearing and grubbing; Top soil stripping and earthworks including temporary stockpiling and disposal of excavated material and protocols for the management of contaminated material; Work around waterways and where construction water may be discharged into natural waterways; Construction and operation of sediment basins including connecting drainage for the associated catchment area; and Drainage works. 	Construction	Project Engineer / Supervisor / Environmental Site Representative	G36 Clause 3.2.4, G38 G40 Clause 1.2.4

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ID	Measure / Requirement	When to implement	Responsibility	Reference
Other Plans and procedures				
SW4	A Water Quality Monitoring Program (WQMP) has been prepared and is provided in Appendix B. This WQMP will be implemented as part of this Soil and Water Management Plan.	Pre-construction / Construction	Environmental Site Representative	G38 Clause 2.3
SW5	Tannin management will be addressed in accordance with the Erosion and Sediment Control Plan (ESCP), which forms Appendix A of the this SWMP. The relevant section of the ESCP has been prepared in accordance with RMS Environmental Direction 25: 'Management of Tannins from Vegetation Mulch'.	Pre-construction / Construction	Project Manager / Supervisor / Environmental Site Representative	G38 Clause 3.6
SW6	Acid sulfate soils and / or potential acid sulfate soils are to be managed in accordance with the Erosion and Sediment Control Plan, which forms Appendix A of the this SWMP.	Pre-construction / Construction	Project Manager / Supervisor / Environmental Site Representative	G38 Clause 2.1.2
Erosion and sediment control				
SW7	A Primary Erosion and Sediment Control Plan (ESCP) has been prepared by the Soil Conservationist (CPESC) and are included in Appendix A of this Plan. The plan includes arrangements for managing wet weather events, including monitoring of potential high-risk events (such as storms) and specific controls and follow-up measures to be applied in wet weather. The Primary Erosion and Sediment Control Plan is to be referred to and considered when preparing progressive erosion and sediment control plans.	Pre-construction and construction	Environmental Site Representative / Project Soil Conservationist	G38 Clause 2.1.2, 2.2.1, 2.2.2, 3.1.1
SW8	Progressive Erosion and Sediment Control Plans (PESCPs) will be prepared and implemented in advance of construction. PESCPs will be updated as required.	Pre-construction and construction	Environmental Site Representative / Project Soil Conservationist	G38 Clause 2.1.2, 2.2.1, 2.2.2. & 2.2.3
SW9	Hardstand material, rumble grids or similar will be provided at exit points from construction areas onto public roads to minimise the tracking of soil and particulates onto public roads.	Pre-construction / Construction	Project Engineer / Supervisor	G38 Clause 2.2 & 3.1.1
SW10	Site compounds, access tracks, stockpile sites and temporary work areas will be designed and located to minimise erosion.	Pre-construction / Construction	Project Manager / Supervisor / Environmental Site Representative	G38 Clause 2.2 & 3.1.1
SW11	Works will be programmed to minimise the extent and duration of disturbance to vegetation and to limit the duration and extent of unstabilised soil surfaces.	Pre-construction / Construction	Project Manager / Supervisor / Environmental Site Representative	G38 Clause 3.1.1 G40 Clause 2.4
SW12	Clean and dirty water runoff will be adequately separated to avoid mixing where possible through the use of diversions, clean water drains, and the early installation of permanent drainage infrastructure.	Pre-construction / Construction	Supervisor	G38 Clause 2.2.2

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ID	Measure / Requirement	When to implement	Responsibility	Reference
SW13	Stabilisation will be implemented for dormant areas exposed for two weeks or more (including stockpiles and batters); by providing soil surface protection (i.e. geotextile fabric, stabilised mulch, soil binder or spray grass)	Construction	Project Engineer / Supervisor	G38 Clause 3.1.1
SW14	Drains, banks or diversions will be formed (and stabilised where required) to direct runoff from disturbed areas to sediment basins or to areas with adequate sediment control devices, and away from watercourses or tributary drainage lines. Berms at top of batter and batter chutes with check dams will be progressively formed and maintained on fill formations.	Construction	Project Engineer / Supervisor	G38 Clause 3.1.1 RMS Technical Guideline - Temporary stormwater drainage for road construction
SW15	Staged re-vegetation and/or other permanent stabilisation will be implemented in Site areas as work proceeds (i.e. Progressively undertaking topsoiling and vegetation work as specified in RMS R178).	Construction	Project Engineer / Supervisor / Environmental Site Representative	G38 Clause 3.1.1
Works in waterways				
SW16	Where work is required within waterways, an Environmental Work Method Statement (EWMS) will be prepared for the work(s) in accordance with RMS G36 for guidelines. The EWMS for work in waterways will detail the control measures to avoid or minimise erosion and any adverse impact on water quality and riparian fauna and flora, and will include the following: <ul style="list-style-type: none"> (a) plan the Work Under the Contract to avoid, where practicable, any activities in aquatic habitats and riparian zones; (b) properly protect and signpost as environmentally sensitive areas, all waterways areas in or adjacent to the Site which are excluded from the work areas. Refer to RMS G36 for the requirements for working in environmentally sensitive areas; (c) minimise riparian vegetation removal where practicable, and restrict access to the waterways to the minimum amount of bank length required for the activity; (d) retain stumps in riparian zones and aquatic habitats, where practicable, to reduce the potential for bank erosion; (e) carry out any refuelling of plant and equipment, chemical storage and decanting at least 50 m away from aquatic habitats unless otherwise approved by the Principal; (f) operate your boats or other watercraft in a manner that prevent boat wash which could cause erosion of the banks, and propeller damage to seagrass beds. 	Construction	Project Engineer / Supervisor / Environmental Site Representative	G38 Clause 3.7.
SW17	Where possible, works in waterways will be scheduled for periods of predicted low flow to minimise impacts and will be undertaken in accordance with RMS Technical Guideline: Temporary Stormwater Drainage for Road Construction.	Construction	Project Engineer / Supervisor / Environmental Site Representative	G38 Clause 3.7. RMS Technical Guideline - Temporary stormwater drainage for road construction

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ID	Measure / Requirement	When to implement	Responsibility	Reference
Stockpiles				
SW18	<p>Stockpiles will be:</p> <ul style="list-style-type: none"> located in designated stockpile sites, above 10 year flood levels, and in approved construction compounds where possible. Stockpiles located in areas below the 10 year flood levels would be managed in accordance with a Construction Flood Management Plan, that would be prepared if required. Located in areas of low ecological or heritage significance. located outside of the tree protection zone or native vegetation identified for retention. The tree protection zone will be delineated in accordance with AS4970 and a stockpile exclusion zone will be maintained at least five metres from retained trees or vegetation, located at least 50 m from likely areas of concentrated water flows and from waterways that are classified as Class 1 and Class 2 from the DPI Fisheries guideline "Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings", formed to heights to no greater than 2 m, (unless otherwise approved by the Principal), and batter slopes to be no steeper than 2:1, established so that any slump of the stockpile will not affect erosion and sediment control measures or infringe on specified minimum clearance requirement, covered or otherwise protected from erosion where stockpiles will be in place for more than 20 days, or temporary stockpiles that are susceptible to wind or water erosion, within 5 days of forming each stockpile. Managed to avoid contamination with noxious weeds and cross-mixing with other stockpiled materials. Weed growth on stockpiles will be monitored and suppressed as required. 	Construction	Project Engineer / Supervisor / Environmental Site Representative	G38 Clause 3.5
Sediment basins				
SW19	Construction sediment basins will be designed and constructed in accordance with the requirements and procedures detailed in the Blue Book Volume's 1 & 2D. The construction sediment basin design/s, restoration and revegetation methodology will be formulated and/or reviewed by the Project Soil Conservationist.	Pre-construction / Construction	Project Soil Conservationist / Supervisor	G38 Clause 3.2.2, Managing Urban Stormwater: Soils and Construction Volumes 1 & 2D
SW20	Operational Sediment Basins and Construction Sediment basins will be constructed in accordance with the procedure and methods detailed at G38 Clause 3.2.1.	Construction	Project Engineer / Supervisor / Environmental Site Representative	G38 Clause 3.2.1., 3.2.2.
SW21	All sediment basins will have depth indicators installed that clearly show the sediment storage zone together with basin identification signage basin number.	Construction	Project Engineer / Supervisor / Environmental Site Representative	Managing Urban Stormwater: Soils and Construction Volumes 1 & 2D

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ID	Measure / Requirement	When to implement	Responsibility	Reference
SW22	Run-off from areas within catchments (that are controlled by sediment basins) is to be diverted to the sediment basins in stabilised drainage lines where possible.	Construction	Supervisor	G38 Clause 3.1.1.
SW23	Suitable all-weather access will be constructed and maintained to sediment basins to allow for basin testing, treatment, discharge and maintenance.	Pre-construction / Construction	Project Engineer / Supervisor / Environmental Site Representative	G38 Clause 3.2.4
SW24	Water quality basins shall be flocculated with an appropriate approved flocculant (eg. gypsum) using an early dosing system to minimise the settling time of suspended dispersible and small sediment particles and to maximise the efficiency of the basins.	Construction	Supervisor	G38 Clause 3.3
SW25	An alternative flocculent will not be used without prior approval from the Principal.	Construction	Environmental Site Representative	G38 Clause 3.3.2
SW26	Prior to discharging any water from a sediment basin, representative water samples will be obtained and tested to ensure that it meets the criteria detailed in the RMS G38 Specification.	Construction	Environmental Site Representative / Supervisor	G38 Clause 3.3.4
SW27	Flocculant or coagulant (whether gypsum or another approved material) will be applied to settle suspended sediments within 24 hours of the conclusion of each rain event causing runoff. The cycle time to treat, dewater and return the maximum storage capacity to any individual construction water quality basin prior to the next rainfall event shall not exceed 5 days.	Construction	Environmental Site Representative / Supervisor	G38 Clause 3.3.3
SW28	Subsequent to the initial series of basin sample tests, where a statistical correlation can be demonstrated between turbidity and Total Suspended Solids (TSS), an application will be made to the Principal to allow for the discharge of supernatant waters based on turbidity measurements before confirmatory laboratory data is available.	Construction	Environmental Site Representative	G38 Clause 3.3.4
SW29	A sediment basin management register will be maintained for each sediment basin that records; <ul style="list-style-type: none"> • personnel approving the dewatering activities; • time & date; • water quality test results and estimated volumes for each discharge. 	Construction	Environmental Site Representative / Project Engineer	G38 Clause 3.4.5
Dewatering				
SW30	Personnel responsible for approval and/or carrying out dewatering activities will be adequately trained and inducted on the dewatering procedures and requirements.	Construction	Environmental Site Representative / Supervisor	G38 Clause 3.4.3

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ID	Measure / Requirement	When to implement	Responsibility	Reference
SW31	<p>Water to be discharged from site will be discharged in accordance with a Site Dewatering Procedure.</p> <p>In accordance with the RMS G38 Specification, the water quality parameters for discharge from licensed discharge points will be:</p> <ul style="list-style-type: none"> • Total Suspended Solids <50mg/L • pH 6.5 - 8.5 • Oil & grease – not visible. <p>For discharge points, exceedance of these parameters is only permitted during rainfall events which exceed the 5-day rainfall event design criteria.</p>	Construction	Environmental Site Representative / Supervisor	G38 Clause 3.3.4., 3.4.2.
SW32	<p>A site dewatering register will be maintained for site areas (other than sediment basins) that require treatment, dewatering and discharge to off-site areas. The register will record;</p> <ul style="list-style-type: none"> • dewatering procedure; • date and time for each discharge at each location; • water quality test results for each discharge; • personnel approving the dewatering activities • evidence of discharge monitoring, or risk assessment and mitigation measures used to eliminate the risks of pollution or erosion. 	Pre-construction / Construction	Environmental Site Representative / Project Engineer	G38 Clause 3.4.5
SW33	<p>Water captured in sediment basins and other site works areas will be reused for dust suppression, compaction, or other construction activities where possible. If a proposed source, other than a town water supply or natural water source, procedures will be developed for regular testing to ensure that the water is suitable for the purpose and is not hazardous to health and the environment.</p>	Construction	Environmental Site Representative / Project Engineer / Supervisor	G38 Clause 3.8
SW34	<p>All dewatering activities will be subject to prior approval from relevant project personnel. The dewatering activities will be monitored to ensure:</p> <ul style="list-style-type: none"> • intake suction devices are positioned to prevent extraction or disturbance of settled sediments, • no erosion is occurring at discharge locations and/or downstream areas, • no inadvertent or intentional controlled discharge of untreated waters occurs. 	Construction	Environmental Site Representative / Supervisor	G38 Clause 3.4.4
Site stabilisation and restoration				
SW35	<p>Management and procedures for site stabilisation will be in accordance with the primary Erosion and Sediment Control Plan at Appendix A of this SWMP.</p>	Construction	Environment Manager / Project Soil Conservationist	G36 Clause 4.16 G38 Clause 3.1.1.

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ID	Measure / Requirement	When to implement	Responsibility	Reference
SW36	<p>The rehabilitation of disturbed areas will be undertaken progressively as construction stages are completed and in accordance with;</p> <ul style="list-style-type: none"> procedures detailed in the Blue Book Volume's 1 & 2D Roads and Maritime Landscape Guideline (RTA, 2008) RMS Guideline for Batter Surface Stabilisation Using Vegetation (2015) 			<p>G36 Clause 4.16 G38 Clause 3.1.1. RMS R178 RMS R179</p>
SW37	Prior to project completion, ancillary areas such as site compounds, material storage areas, access routes and haul roads, stockpile areas, construction sediment basins, etc will progressively restored to a stable, vegetated condition similar to that existing before disturbance, unless authorised otherwise by the Principal within the road corridor, or as otherwise agreed with the landowner for private lands.	Construction / Post construction	Supervisor	G36 Clause 4.16
SW38	<p>Restoration of these areas includes;</p> <ul style="list-style-type: none"> topsoiling of the areas; seeding, planting, watering and maintenance; removal of temporary erosion control devices and of accumulated sediments removal of unused construction materials and waste materials. 	Construction / Post construction	Environmental Site Representative / Supervisor	<p>G36 Clause 4.16 RMS R178 RMS R179</p>
Spill prevention and response				
SW39	Management for spill prevention and response will be in accordance with 4.10 of the CEMP. An Emergency Spill Response Procedure will be developed based on the requirements of Table 22.	Pre-construction / Construction	Environmental Site Representative / Supervisor / Project Manager	G36 Clause 4.3
SW40	Emergency wet and dry spill kits will be kept on site at locations described within the Emergency Spill Response Management Procedures (ie at compounds). All personnel will be made aware of the spill kit locations and will be trained in their use.	Construction	Environmental Site Representative / Supervisor	G36 Clause 3.5, 4.3
SW41	A schedule of all hazardous materials kept on site during construction will be maintained for the duration of the project.	Construction	Environmental Site Representative / Supervisor	G36 Clause 4.3
SW42	<p>The ancillary facilities will be managed within the ESCP. The following measures will be included to limit sediment and other contaminations entering receiving waterways:</p> <ul style="list-style-type: none"> Chemicals will be stored within a sealed or bunded area not within 50 m of any aquatic habitat, any areas of concentrated water flow, flood prone or poorly drained areas, or on slopes steeper than 1:10 Vehicle movements will be restricted to designated pathways where feasible and appropriate controls will be in place where plant is stored Run-off from ancillary sites will be controlled and treated before discharging into downstream waterways Areas that will be exposed for extended periods, such as car parks and main access roads, will be stabilised where feasible. 	Contractor	Construction	G36 Clause 4.3, 4.15.1

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ID	Measure / Requirement	When to implement	Responsibility	Reference
SW43	All spills and associated environmental incidents are to be reported in accordance with Section 3.5 of the CEMP.	Construction	Environmental Site Representative / Supervisor	G36 Clause 4.3, 4.14
Monitoring and inspections				
SW44	Nominated project personnel will conduct site inspections of erosion and sedimentation controls at least weekly.	Construction	Environmental Site Representative / Supervisor	G38 Clause 4
SW45	<p>All disturbed areas, revegetated/stabilised areas and all permanent and temporary erosion and sediment control works will be inspected:</p> <ul style="list-style-type: none"> • At least weekly • Immediately before extended site shut down • after the start of all rainfall events exceeding 10mm and during periods of prolonged rainfall <ul style="list-style-type: none"> ○ as soon as practicable but within 3 hours (during normal work hours and days) ○ or within 24 hours (outside normal work hours and days, including industry rostered days off and public holidays) 	Construction	Environmental Site Representative / Supervisor	G38 Clause 2.1.2 G38 Clause 4
SW48	A Soil Conservationist (CPESC) will undertake periodic site inspections of the ESCP implementation across the site and prepare a report.	Construction	Project Manager / Environmental Site Representative	G38 Clause 4
SW49	<p>Any rectification measures which are identified will be addressed and / or recorded to ensure appropriate rectification within the nominated timeframe. The timeframe for rectification works is based on a risk assessment of deficiencies in controls, being;</p> <ul style="list-style-type: none"> • Immediate: on day of inspection • High: within 24 hours of inspection • Medium: within 3 working days of inspection; and • Low: within 3 working days of inspection. 	Construction	Environmental Site Representative / Supervisor	G38 Clause 4
SW50	Monitoring of rainfall events (with observations of rainfall in millilitres) will be undertaken daily during normal work days.	Construction	Environmental Site Representative	G38 Clause 3.1.1., 4

7 COMPLIANCE MANAGEMENT

7.1 Roles and responsibilities

The structure and overall roles and responsibilities are outlined in Section 3.2 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this Plan.

7.2 Training

All employees, contractors and utility staff working on site will undergo site induction training relating to soil and water management issues. The induction training will address elements including:

- Existence and requirements of this sub-plan.
- Relevant legislation.
- Incident response, management and reporting.
- Roles and responsibilities for soil and water management.
- Water quality management and protection measures.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in soil and water management. Examples of training topics include:

- ERSED control installation methodology.
- Sediment basin construction.
- Sediment basin operation.
- Sediment basin maintenance.
- Working near or in drainage lines and creeks.
- Emergency response measures in high rainfall events.
- Preparedness for high rainfall events.
- Lessons learnt from incidents and other event eg high rainfall/flooding.
- Mulch and tannin management.
- Spill response.
- Stockpile location criteria.

Further details regarding staff induction and training are outlined in the CEMP.

7.3 Monitoring and inspection

Regular monitoring and inspections will be undertaken during construction. Monitoring and inspections will include, but not be limited to:

- Up and downstream of the project alignment, water quality monitoring at nominated locations.
- Construction sediment basin water quality prior to discharge.
- Weekly and post rainfall inspections to evaluate the effectiveness of erosion and sediment controls measures in accordance with Table 7.

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Table 7 - Inspection Schedule

Activity	Frequency	Location	Responsibility	Record
Environmental Site Inspection	Weekly	Site wide	Environmental Site Representative	Site inspection log
Rainfall Inspection (10mm or greater rainfall as per G36 3.1.1. & 4.	Prior to rainfall event, during event, within 24 hours after the event	Site wide	Environmental Site Representative	Site inspection log

Additional requirements and responsibilities in relation to inspections, in addition to those in Table 7, are documented in Section 5.1 of the CEMP.

7.4 Sediment Basin Discharge Criteria

RMS G38 specification prescribes water quality parameters to be measured and associated discharge criteria. It also details the monitoring and analytical requirements by reference to authority publications e.g. Approved Methods for Sampling and Analysis of Water Pollutants in NSW, 2004.

The water quality discharge criteria for the project are listed below, in Table 8.

Table 8 – Discharge water quality criteria

Parameter	Criteria	Sampling method	Frequency
pH	6.5 –8.5	Probe	Daily during any discharge
Turbidity	TBA following correlation with TSS results	Probe or Grab Sample	Likely to be required daily during any discharge
Total Suspended Solids*	50 mg/L	Grab Sample	Daily during any discharge
Oil and Grease*	No visible	Visual inspection	Daily during any discharge

Any other relevant licences or permits will be obtained in the lead up to and during construction as required.

7.5 Weather monitoring

A rain gauge to be installed in the main compound will be used in the monitoring of rainfall events. The Wet Weather Contingency Procedure is detailed in the Project ESCP at Annexure E.

7.6 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation and management measures, compliance with this plan and other relevant approvals, licences and guidelines. Audit requirements are detailed in Section 5.3 of the CEMP.

7.7 Reporting

Reporting requirements and responsibilities are documented in Section 5.2 of the CEMP.

8 REVIEW AND IMPROVEMENT

8.1 Continuous improvement

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

The continuous improvement process will be designed to:

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

8.2 SWMP update and amendment

The processes described in Section 5.4 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to the SWMP will be in accordance with the process outlined in Section 6 of the CEMP. All updates will be completed in consultation with all relevant stakeholders and will then be distributed and communicated once approved.

Appendix A

Erosion and Sediment Control Plan

Stage 1, Phase 1 – Clearing, grubbing and topsoil stripping.

NOTES - Administration & General

1. This progressive plan is to be read in conjunction with the SWMP, CEMP, relevant specifications, and procedures.
2. Works programming to maximise the mitigation of erosion by the early implementation of permanent drainage measures, temporary and permanent soil surface stabilisation measures, and minimising the area and duration of soil disturbance.
3. Bureau of Meteorology weather forecasting to be monitored daily for the local 7-Day weather outlook. Site management measures to be planned for imminent storm/rainfall/flood/wind events include, but are not limited to;
 - avoiding additional soil disturbance immediately prior to an event,
 - provision of additional erosion and sediment controls in critical locations,
 - installing, repairing, and/or adjusting ‘clean’ (off site water) and ‘dirty’ (on site) water drainage measures,
 - desilting and re-instating sediment controls as required,
 - implementing stockpile protection measures,
 - stabilising and sealing disturbed soil surfaces,
 - minimising dry soil handling in windy conditions,
 - evacuating or protecting erodible materials in lower lying area.
4. The plan is to be revised as necessary (i.e. progression of works, altered site conditions or weather). **The controls depicted are subject to staging and the controls may be progressively implemented or removed according to progression of works. The symbols depicting controls are not to scale and are only indicative of the general location and type of control selected.**
5. All erosion and sediment controls generally to be constructed in accordance with ‘Blue Book’ specifications and standard drawings & RMS Specifications being
 - MANAGING URBAN STORM WATER: SOILS AND CONSTRUCTION - 4th EDITION, LANDCOM, MARCH 2004;
 - MANAGING URBAN STORM WATER: SOILS AND CONSTRUCTION – VOLUME 2D MAIN ROAD CONSTRUCTION, DEC, 2008;
 - RMS QA SPECIFICATION G36 - ENVIRONMENTAL MANAGEMENT (SOIL AND WATER MANAGEMENT PLAN)
 - RMS QA SPECIFICATION G38 - SOIL AND WATER MANAGEMENT (EROSION AND SEDIMENT CONTROL PLAN).
6. Substitute materials may be utilised in the construction of erosion or sediment controls where functionality is not affected, i.e. compacted mulch bunds in place of sediment fences, stabilised earth Berms in place of excavated drains near underground services or timber pegs in place of star pickets where electrical or gas.
7. Personnel constructing controls to have demonstrated competence and experience. Specific awareness training and workshops to be undertaken by personnel with direct involvement with erosion and sediment control. Toolbox talks to regularly focus on erosion and sediment control for specific works, associated risks, potential impacts and mitigation measures.
8. All existing vegetated or undisturbed areas outside of the works area to be regarded as “No Go” zones and to be delineated with fencing, tape or other markers, as required. All site personnel to be instructed to avoid “No Go” zones or damaging installed controls.

Erosion Control

9. During the process of clearing, maintain a control bund of cleared vegetation to control run-off as works progress. Boundary sediment controls to be installed as soon as practical as the clearing front advances. Maintain clearing slash and minimise disturbance of ground vegetation, where possible.
10. Prior to commencement of significant works, install surface drains, sediment traps, sumps & filters, and other surface runoff control measures to control runoff onto, across, and from the works zones to prevent the loss of sediment from the site.
11. Construction zones in constrained areas to be managed in smaller, defined sub-catchments to reduce slope lengths and minimise sediment loads to boundary controls.
12. Stripped topsoil to be stripped and stockpiled generally as per SD 4-1. Any viable stripped topsoil to be stored in stockpiles, preferably less than two metres in height.
13. Short term on-site stockpiles to be located away from drains and flow lines and be controlled with sediment fence or storm covers.
14. Any significant (long & steep) cut/fill batters should be progressively overlaid with Rolled Erosion Control Products (RECP’s such as jute mesh, coir fibre mesh, etc), mulching, Organic Fibre Mulches (OFM’s) or geobinders to reduce erosion and rilling, prior to permanent stabilisation with cover crops, mulching or other long-term surface protection
15. Vehicles transporting bulk materials on public roads are to correctly cover loads to prevent loss of load and/or dust generation.
16. Temporary controls in addition to those shown may be required at strategic locations as required by the progression of works or weather conditions

Water Management (Cont’d)

17. Maximise the interception and diversion of ‘clean’ (off site water) away from works areas. The ‘clean’ flows to be conveyed in stabilised drainage lines to suitable discharge points. The flows to be discharged to off-site areas at non-erosive velocities with adequate diffusers, level spreaders, etc. Ensure drainage paths and controls are adjusted as required to maximise the separation of ‘clean’ (off site) and ‘dirty’ (on site) water flows through/off site.
18. Flows paths with high velocity flows over unstabilised areas to be controlled with
 - applied soil surface stabilisers i.e. geotextile lining, applied soil binders, coarse rock lining, etc
 - suitably constructed check dams placed at intervals to maximise flow suppression and settling of coarse sediment.
19. Where possible, provide sand bag or other bunding controls at on-site collection points & pit inlets to prevent flows bypassing controls to downslope areas.
20. Protect all existing and constructed inlets to pits & culverts from sediment ingress.
21. Where practical, maintain and/or improve existing stabilised drains to assist in the diversion of ‘clean’ (off site) flows.
22. Flooded excavations, ponded water, etc. to be extracted where required and utilised for site purposes, or treated to achieve acceptable water quality prior to discharge.

Sediment Control

23. Vegetation to be progressively cleared to minimise disturbance by area and duration. Cleared vegetation to be windrowed parallel to the contour until mulching/removal to control flows across cleared areas
24. The installation of preliminary sediment controls such as perimeter sediment fencing, windrowed vegetation/mulch, excavated sediment traps, check dams, straw bale filters, etc, will be implemented prior to soil disturbance within the catchment.
25. Accumulated water in sediment traps/sumps cannot be pumped, discharged or released from site without completing a dewatering checklist.
26. Appropriate sediment tracking controls such as an aggregate/geotextile apron, shaker grid, etc. will be installed at exit points from the site. Personnel to monitor roadways & tracked sediments to be removed as required.
27. Personnel to ensure visual dust monitoring is maintained during works, and dust suppression is undertaken regularly. Dust control to be regularly conducted with water carts and soil stockpiles to suitably covered. Additional dust suppression measures to be utilised to minimise dust pollution during periods of high winds.
28. Temporary ‘dirty’ water drainage will be adjusted progressively to maximise flows to sediment control devices.

Contamination



29. Excavation of sub-soils to be inspected and monitored as works proceeds, to identify potential contamination. Any potentially contaminated soils to be stripped or excavated separately and transported directly to the designated stockpile, treatment area or licensed waste facility.
30. Potentially contaminated soils are to be stored within an appropriately bunded area and covered with heavy grade plastic or other impermeable covers for the duration of rainfall.
31. Ground disturbance and machinery/vehicle movements in potentially contaminated areas will be minimised to essential works.

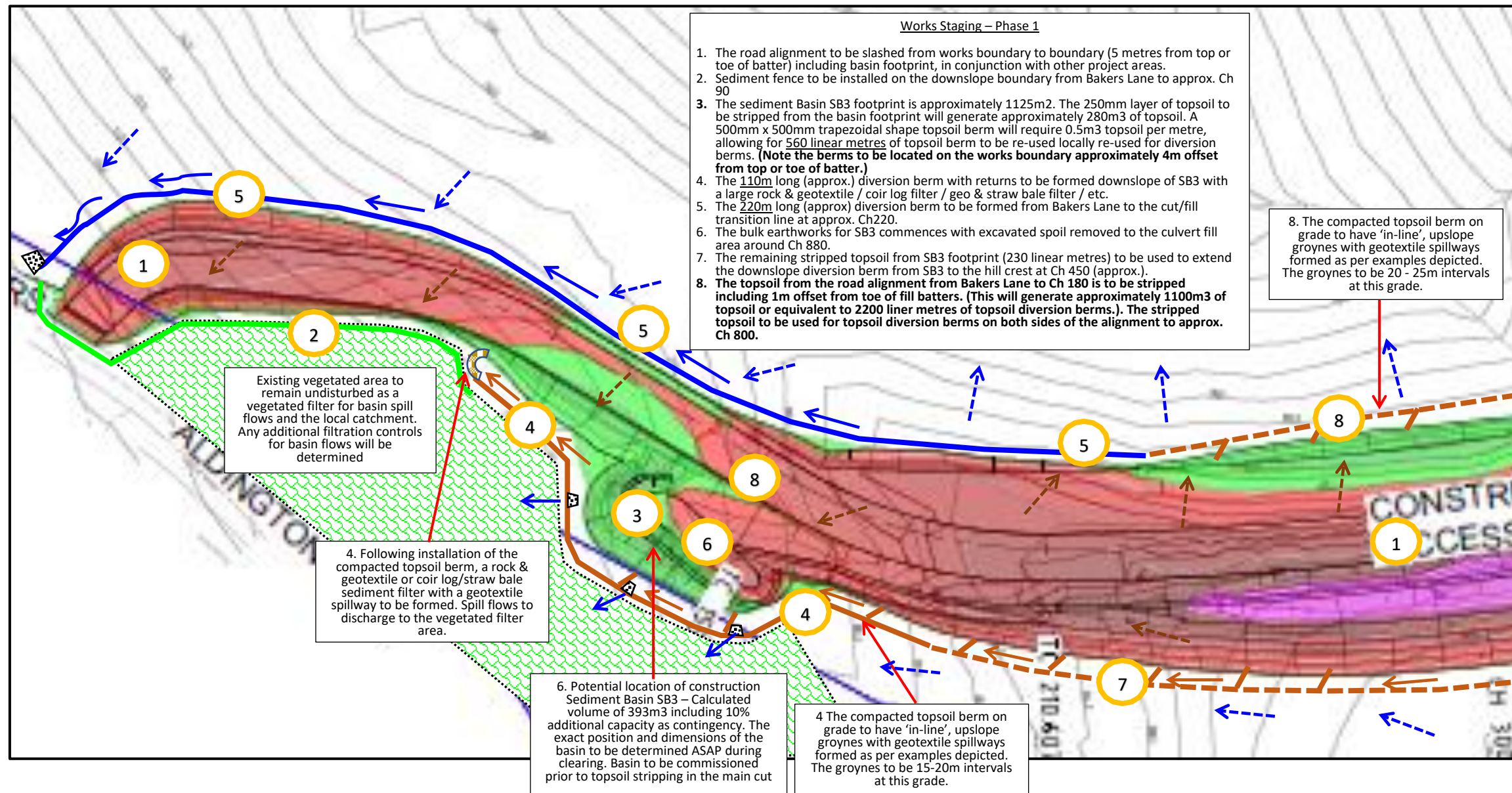
Monitoring & Reporting and Inspection & Maintenance

32. Inspections of erosion and sediment controls will occur following rainfall events >10mm (daily on work days or as soon as practical during site shutdown periods), with any necessary repairs implemented as soon as possible.
33. Relevant checklists and records to be maintained noting details such as rainfall received, repairs to controls and amounts of sediments cleaned from controls.
34. Sediment traps, sumps and filters are to be desilted when 60% of storage capacity is reached.
35. All site personnel to report any spill, leaks, or other failure to relevant response staff as soon as possible.

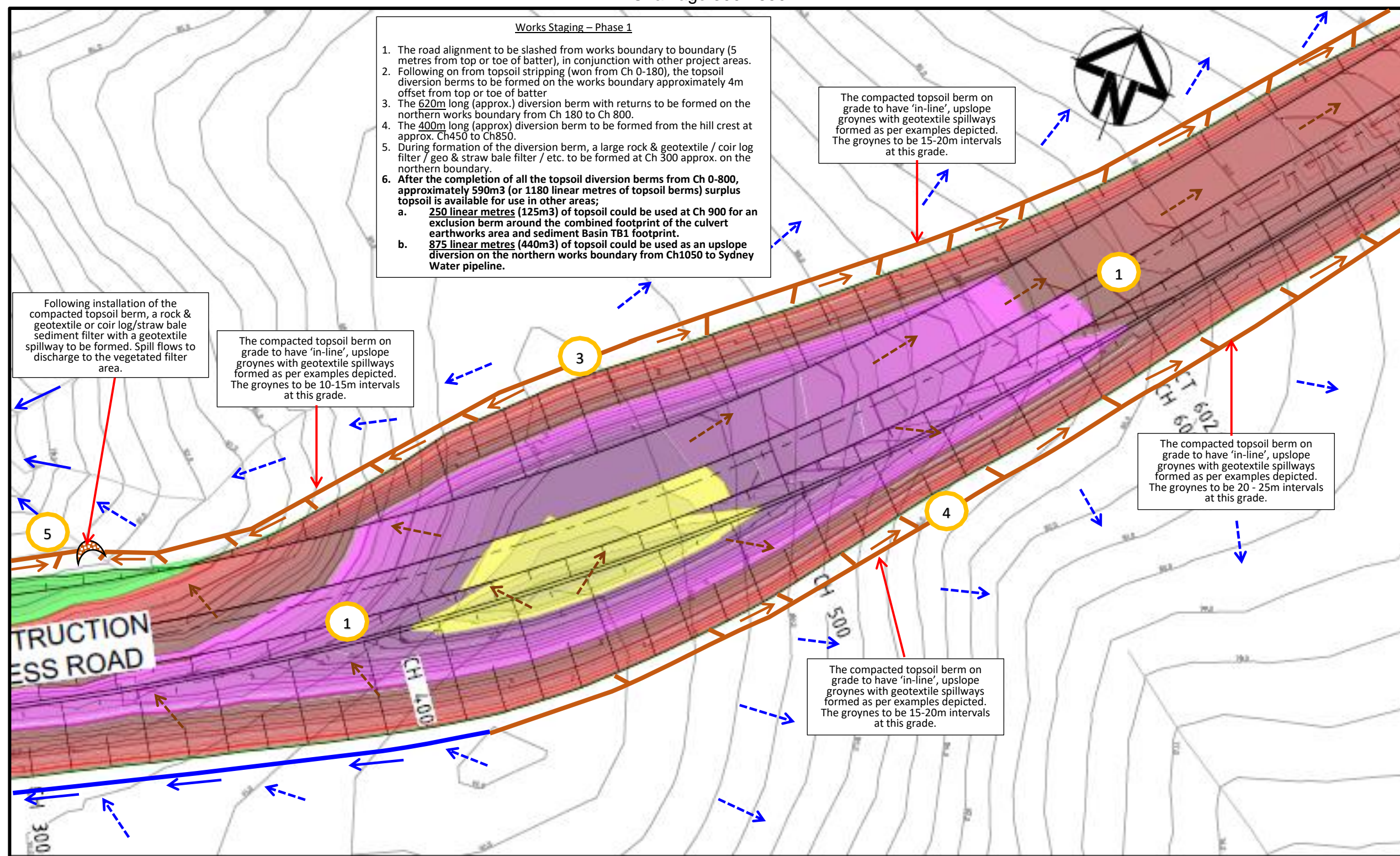
Stabilisation

36. Erosion and sediment controls are to be maintained until the relevant catchments are stabilised, re-vegetated, or sealed adequately to achieve soil surface protection factors as per the ‘Blue Book’ and SWMP requirements.
37. Completed earthworks areas will be backfilled and compacted in a staged manner as soon as possible. Adjacent disturbed areas will be suitably trimmed and stabilised as required.
38. Stabilisation of areas is to occur progressively in conjunction with the completion of earthworks.
39. Areas subject to heavy compaction and disturbance from vehicle movements and machinery to be scarified to a depth >100mm prior to topsoiling and seeding.

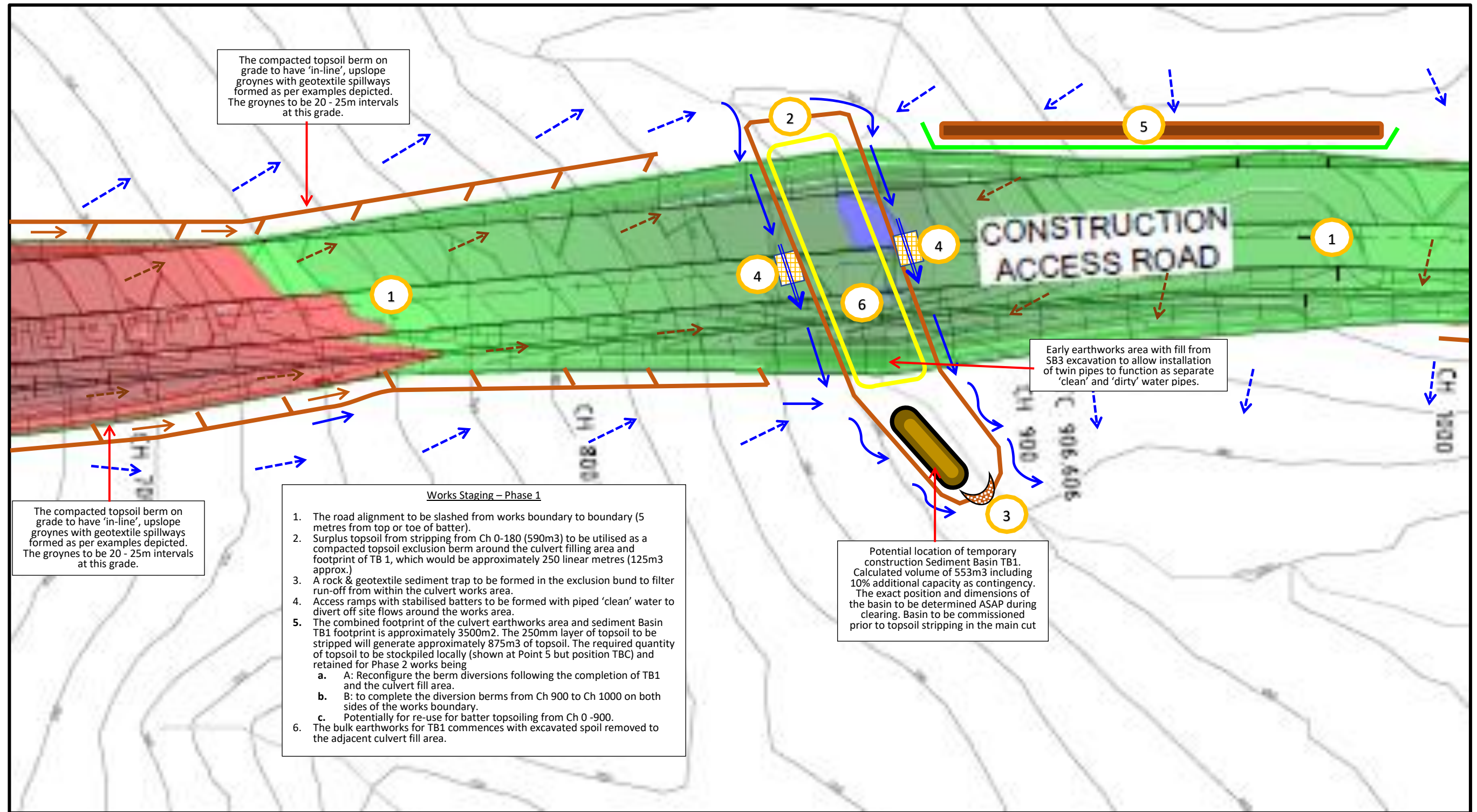
Version	Drawn by	Date	Signed	Reviewed by	Date
01	A. Littlewood	27/06/2019			
02	A. Littlewood	12/09/2019			



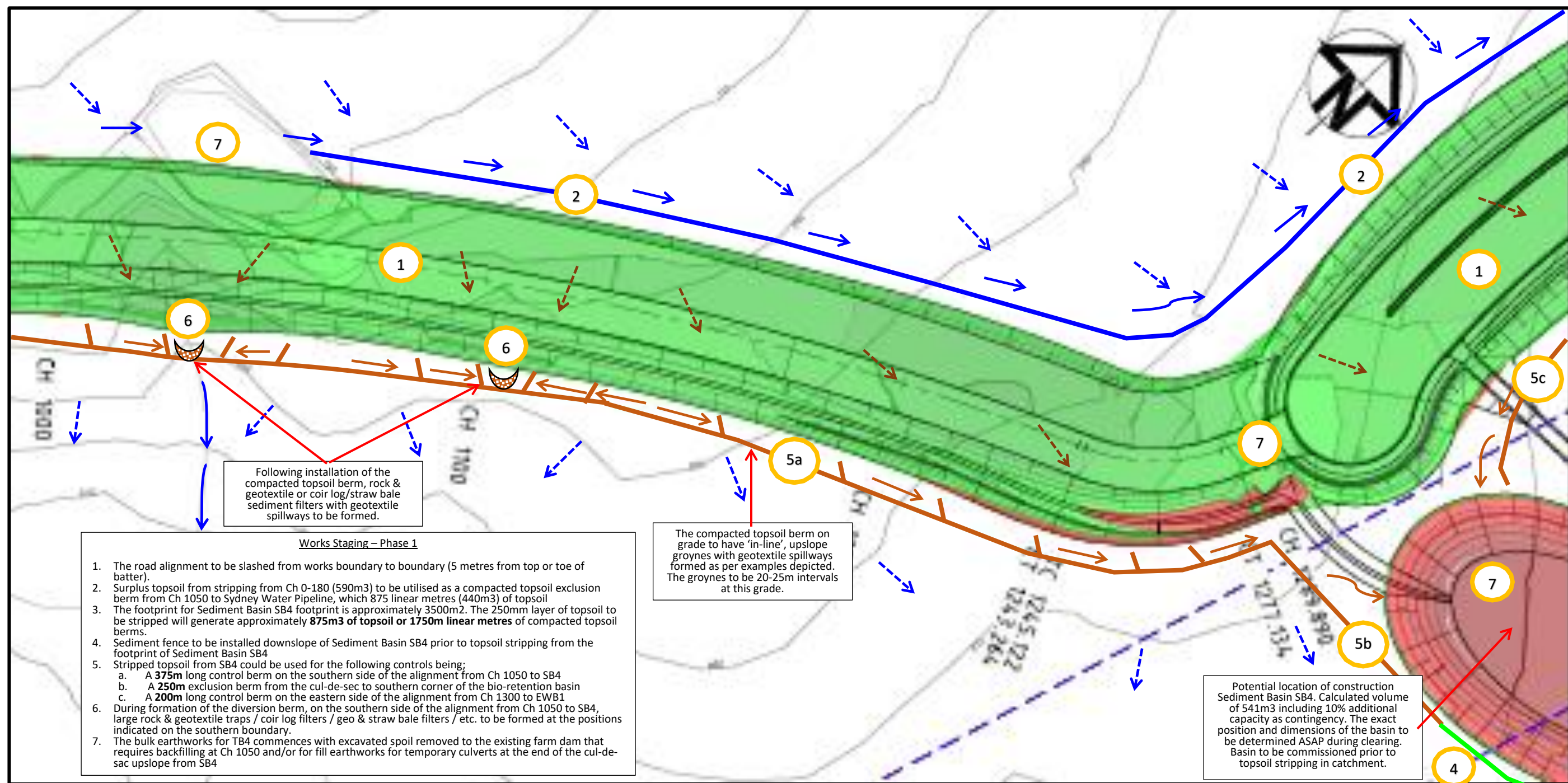
Legend											
Off Site Water – Sheet Flows		Piped Drainage		Stabilised Topsoil Berm (geo/jute/seed)		Sediment basin / large sump		Sediment Fence Geotextile Apron		Vegetated filter	
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Stage A, Phase 1 – Clearing, grubbing and topsoil stripping – Ch 1300 to Sydney Water Pipeline.

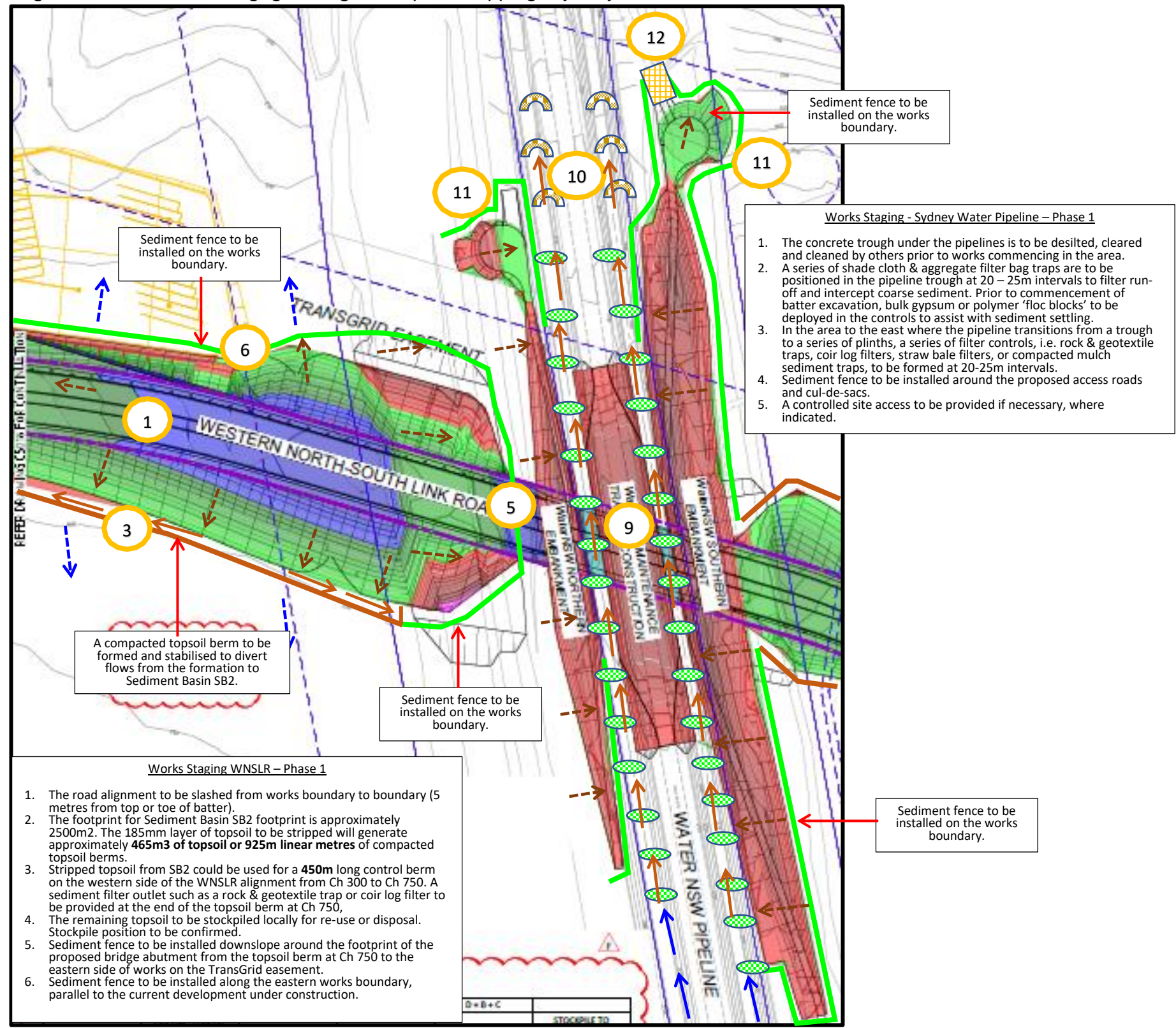
Works Staging – Phase 1

1. The road alignment to be slashed from works boundary to boundary (5 metres from top or toe of batter), together with the Basin footprints, Bio basin outlet drain and topsoil stockpile area.
2. Surplus topsoil from stripping from Ch 0-180 (590m³) to be utilised as a compacted topsoil exclusion berm from Ch 1050 to Sydney Water Pipeline, which 875 linear metres (440m³) of topsoil.
3. The outlet drain from the Bio Retention Basin to be prioritised for early completion.
 - a. Sediment fence to be installed on the downslope boundary of the drain and bio-retention basin.
 - b. The controls at Ropes Creek interface to be determined prior to works commencing.
4. The footprint of the outlet drain from the Bio Retention Basin has a footprint of 1800m² approx. The 250mm layer of topsoil to be stripped will generate approximately **450m³ of topsoil or 900m linear metres** of compacted topsoil berms.
 - a. The topsoil can be used to form a **450m** long exclusion berm on the eastern side of the alignment from the Sydney Water Pipeline to the Bio-retention basin outlet.
 - b. The remaining 250m³ of topsoil to be transported and stockpiled in the topsoil stockpile area.
5. Sediment fence to be installed downslope of Sediment Basin SB4 prior to topsoil stripping from the footprint of Sediment Basin SB4
6. The footprint Sediment Basin SB4 footprint is approximately 3500m². The 250mm layer of topsoil to be stripped will generate approximately **875m³ of topsoil or 1750m linear metres** of compacted topsoil berms.
7. Stripped topsoil from SB4 could be used for the following controls being;
 - a. A **250m** exclusion berm from the cul-de-sac to southern corner of the bio-retention basin
 - b. A **200m** long control berm on the eastern side of the alignment from Ch 1300 to EWB1
 - c. A **250m** long control berm around the topsoil stockpile area.
 - d. The remaining 525m³ of topsoil to be transported and stockpiled in the topsoil stockpile area.
8. The Early Works Sediment Basin EWB1 has an approximate footprint of 3000m², which will generate approximately 750m³ of topsoil that would be directly stripped and transported to the topsoil stockpile area.
9. Earthworks for SB4 and EWB1 could then commence. with excavated spoil removed to
 - a. the existing farm dam that requires backfilling at Ch 1050
 - b. The temporary 'clean' and 'dirty' water culverts at the cul-de-sac upslope from SB 4 at Ch 1280
 - c. removed to the culvert fill areas around the Road No.1 roundabout area to allow for early installation of 'dirty' water cross drainage or temporary culverts.
10. The remaining controls for the topsoil and soil stockpile area to be implemented. The maximum topsoil/spoil storage capacity is approx. 24000m³.



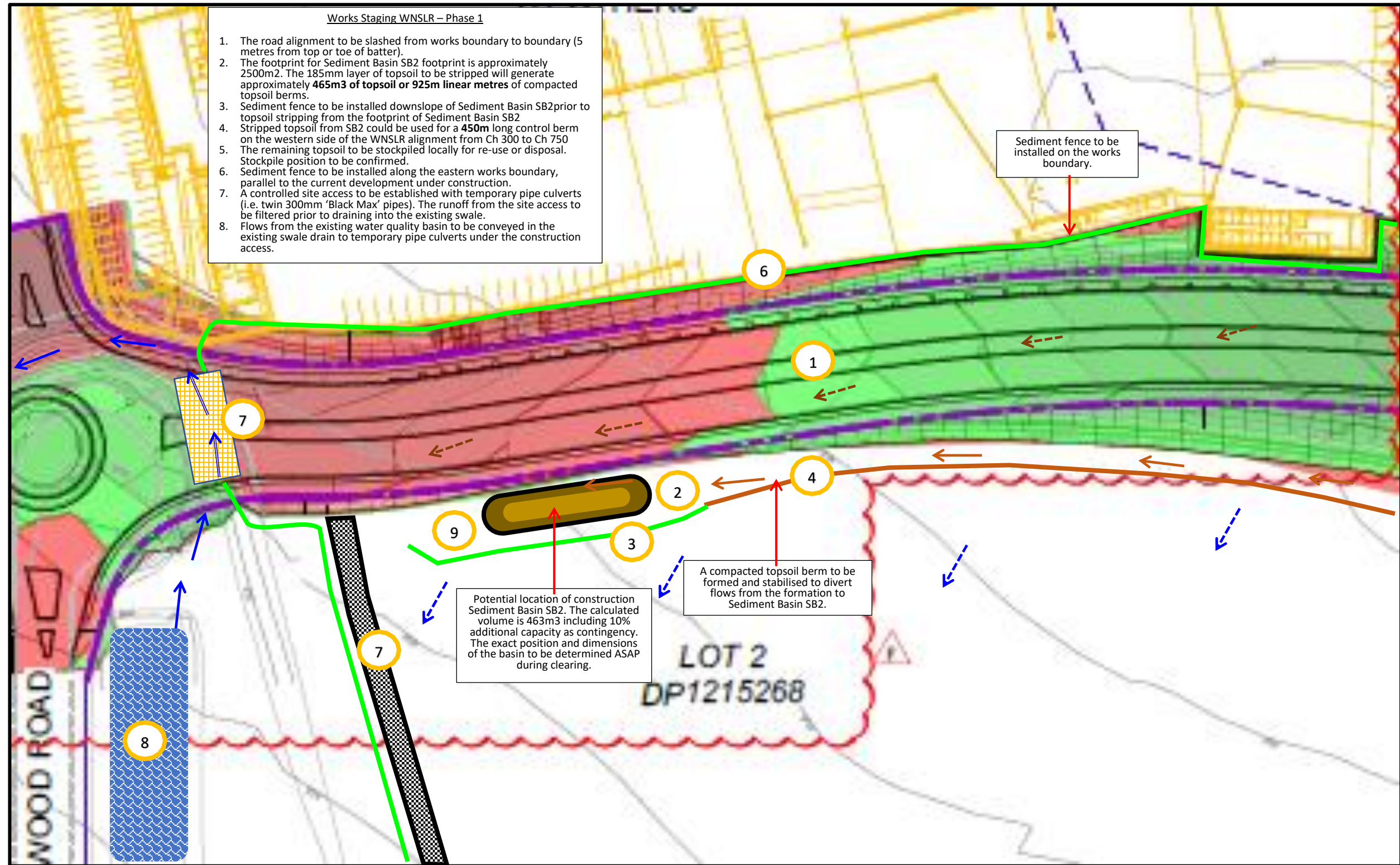
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Stage A, Phase 1 – Clearing, grubbing and topsoil stripping: Sydney Water to WNSLR Ch 600



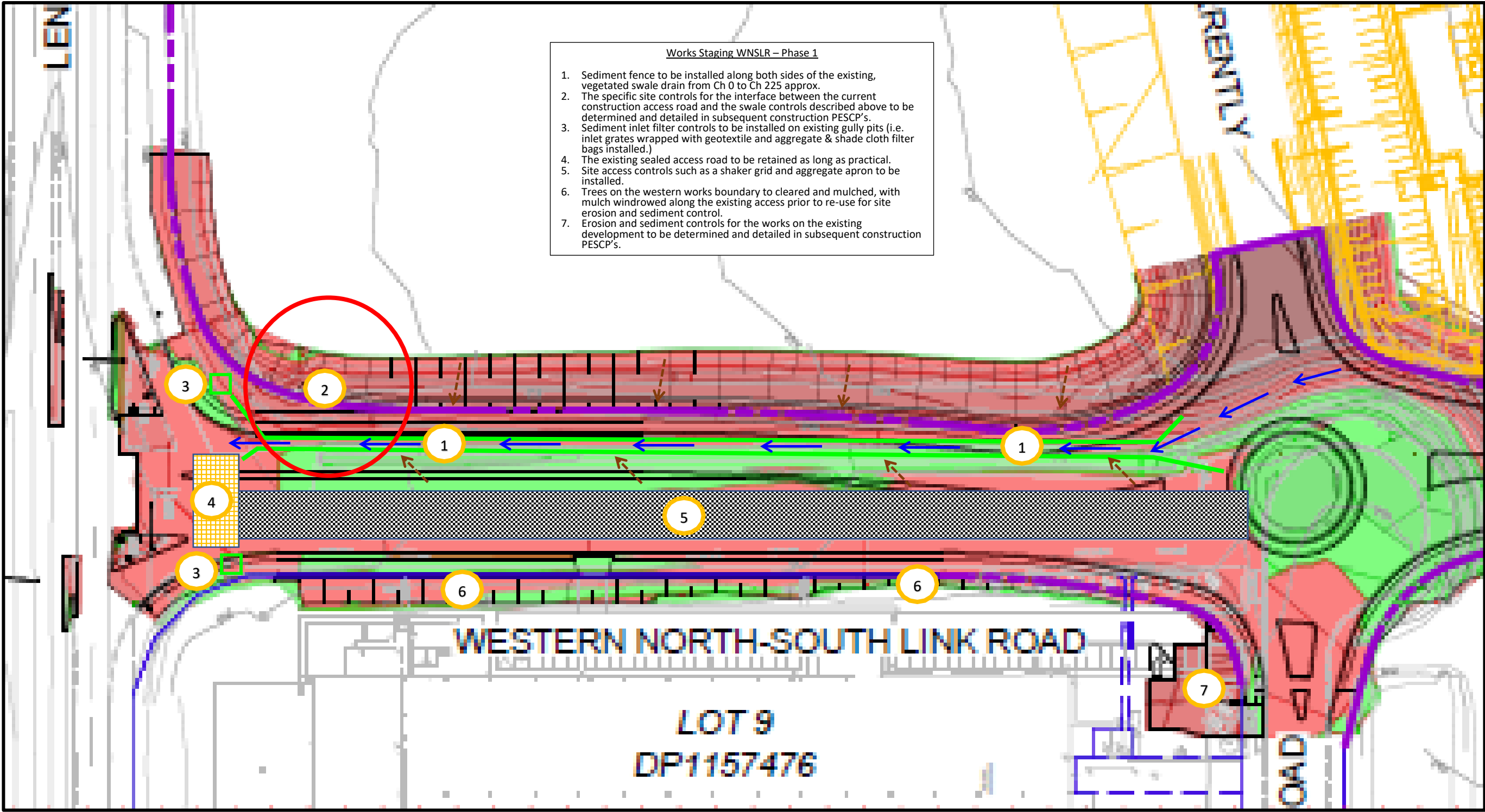
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Stage A, Phase 1 – Clearing, grubbing and topsoil stripping: Ch550 to Lockwood Road Roundabout



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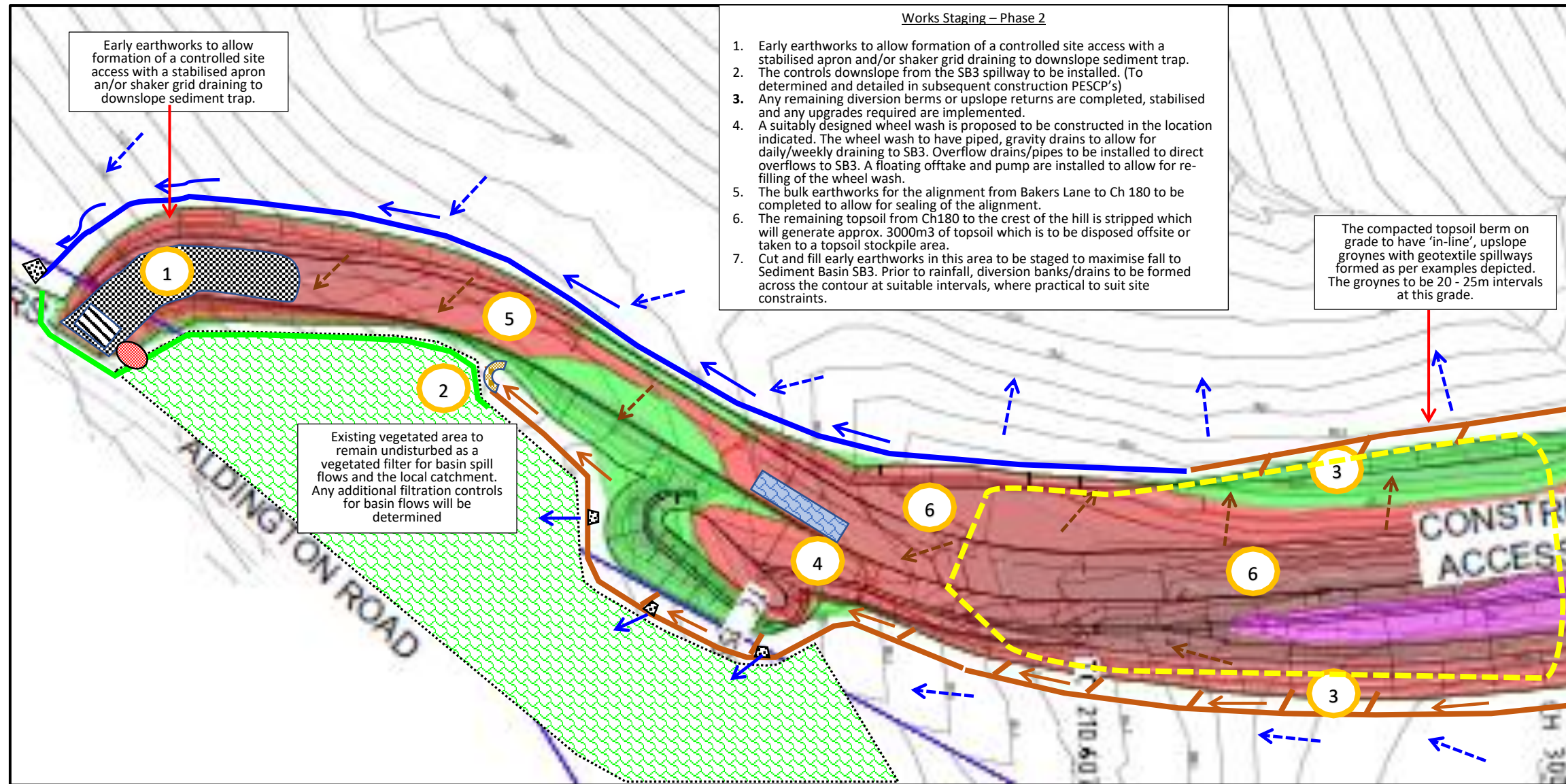
Stage A, Phase 1 – Clearing, grubbing and topsoil stripping: Lockwood Road Roundabout to Lenore Drive



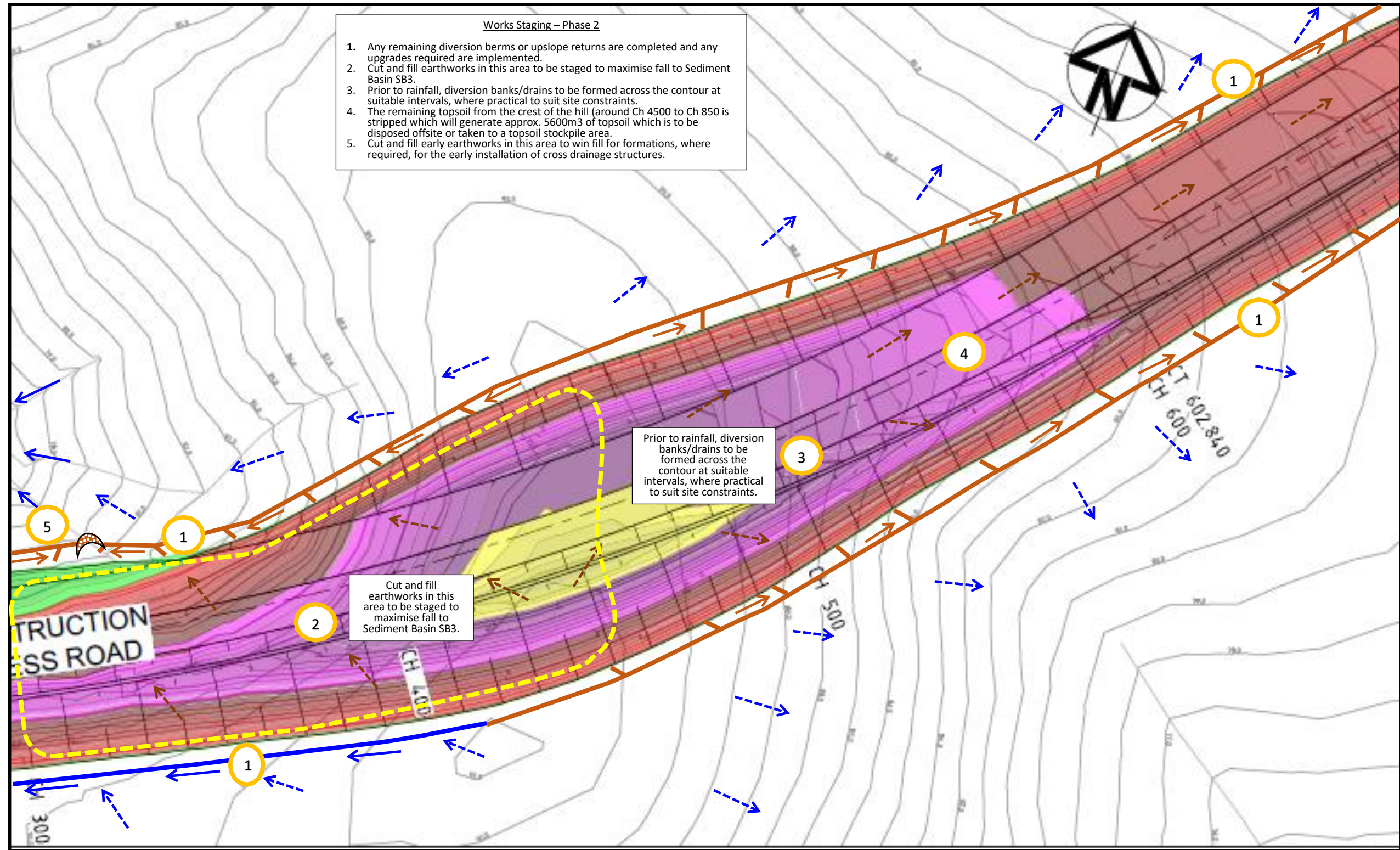
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Stage A, Phase 2 – Topsoil stripping and early earthworks.

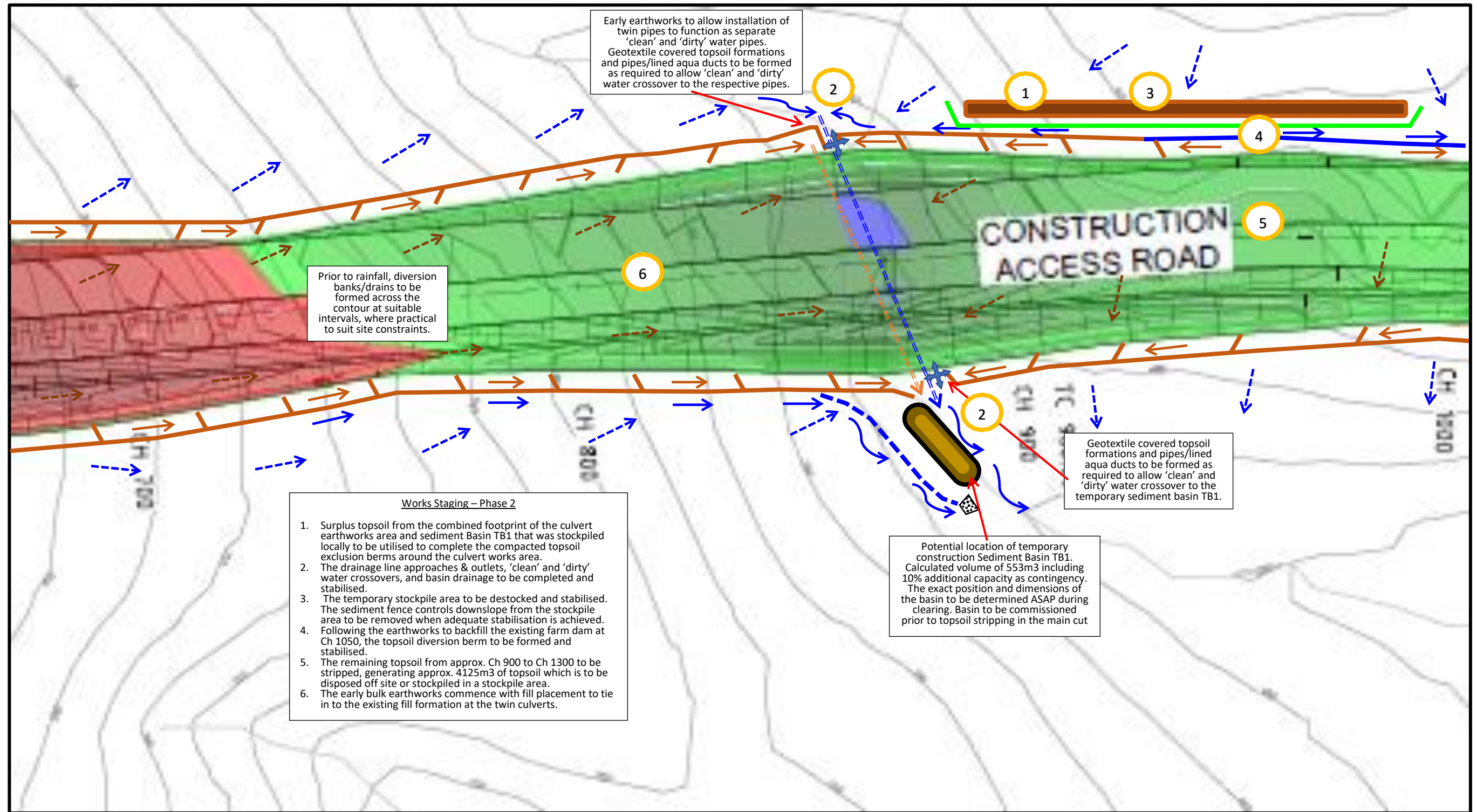
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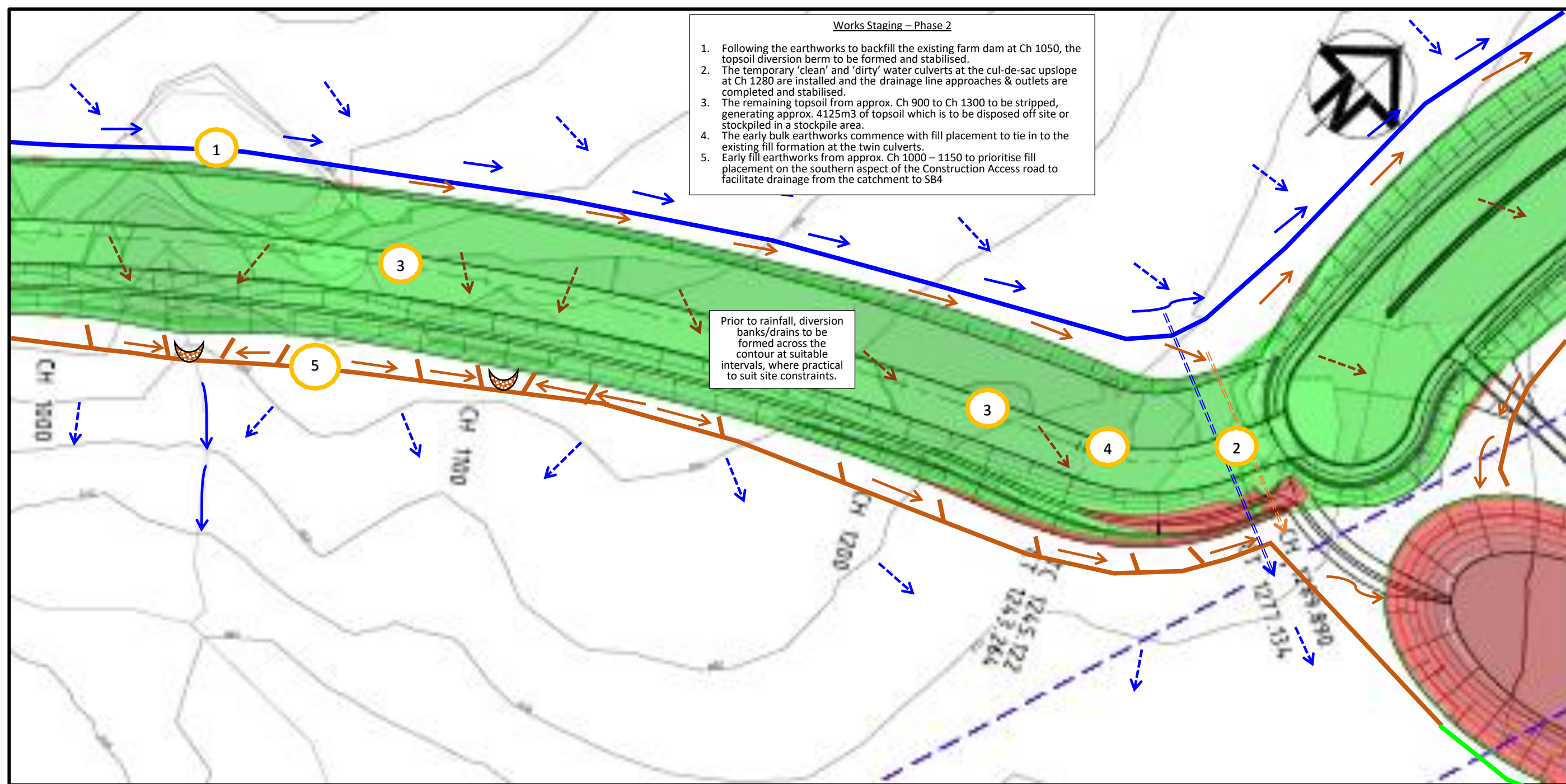
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Stage A, Phase 2 – Topsoil stripping and early earthworks. Chainage 1300 to Sydney Water Pipeline

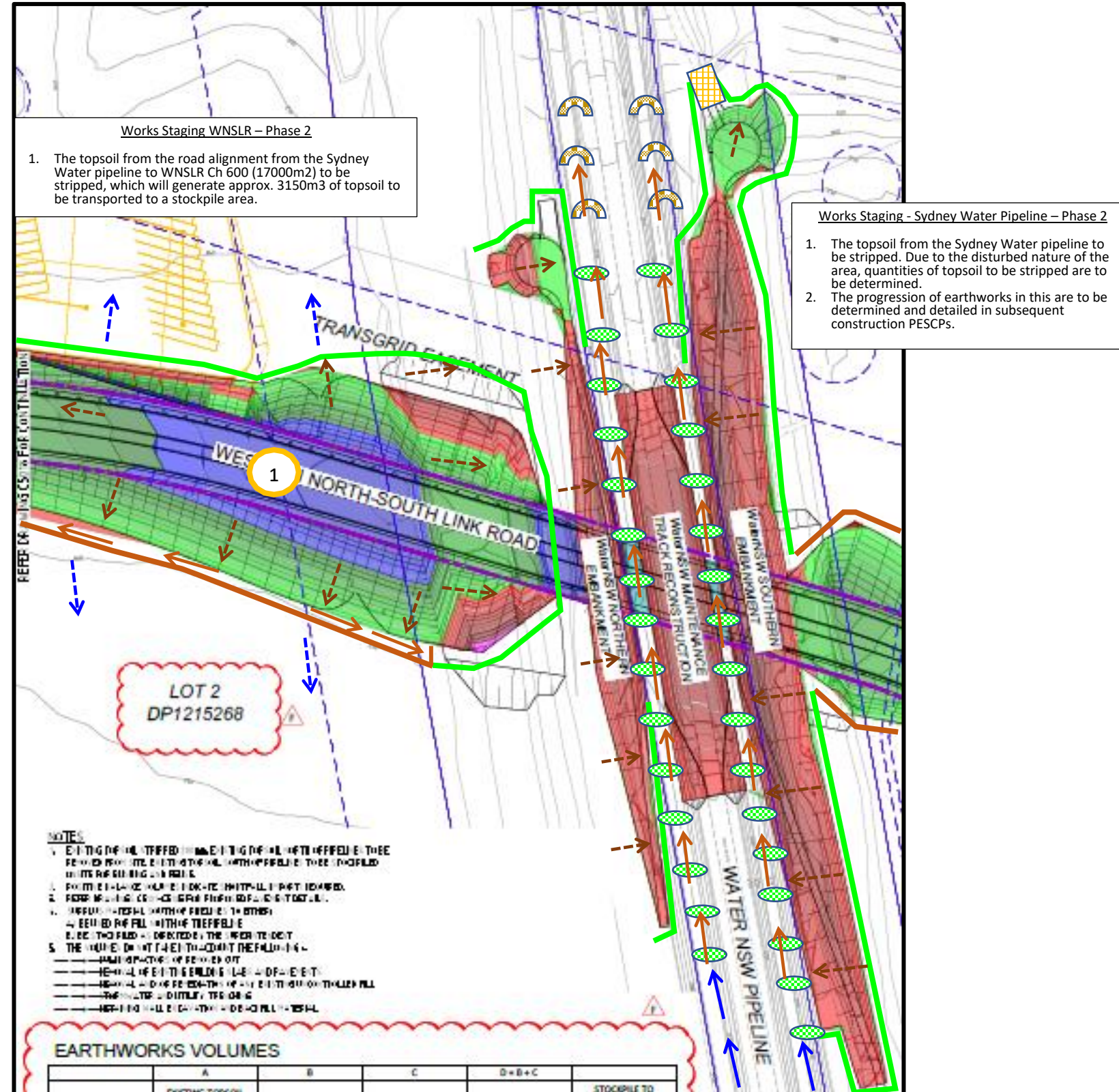
Works Staging – Phase 2

1. Following fill earthworks for;
 - a. The temporary 'clean' and 'dirty' water culverts at the cul-de-sac upslope at Ch 1280, and
 - b. The 'dirty' water culverts in the vicinity of Road No.1 at approx. Ch 980 & 1060
 The culverts are installed and the inlets & outlets are completed and stabilised
2. Following commissioning of sediment basins EWB1 and SB4, the topsoil is stripped from the 12250m² footprint of the Bio Retention Basin No. 1 which will generate approx. 3050m³ of topsoil which will be stockpiled in the stockpile area.
3. The remaining topsoil from the WNSLR from approx. Ch 850 to Ch 1300 to be stripped (22000m² approx.), generating approx. 5500m³ of topsoil which is to be stockpiled in a stockpile area.
4. The earthworks for the Bio Retention Basin No. 1 is completed and the inlets from EWB1 & SB4 installed and stabilised. The outlet swale and associated drainage from the Bio Basin is commissioned and stabilised where required.



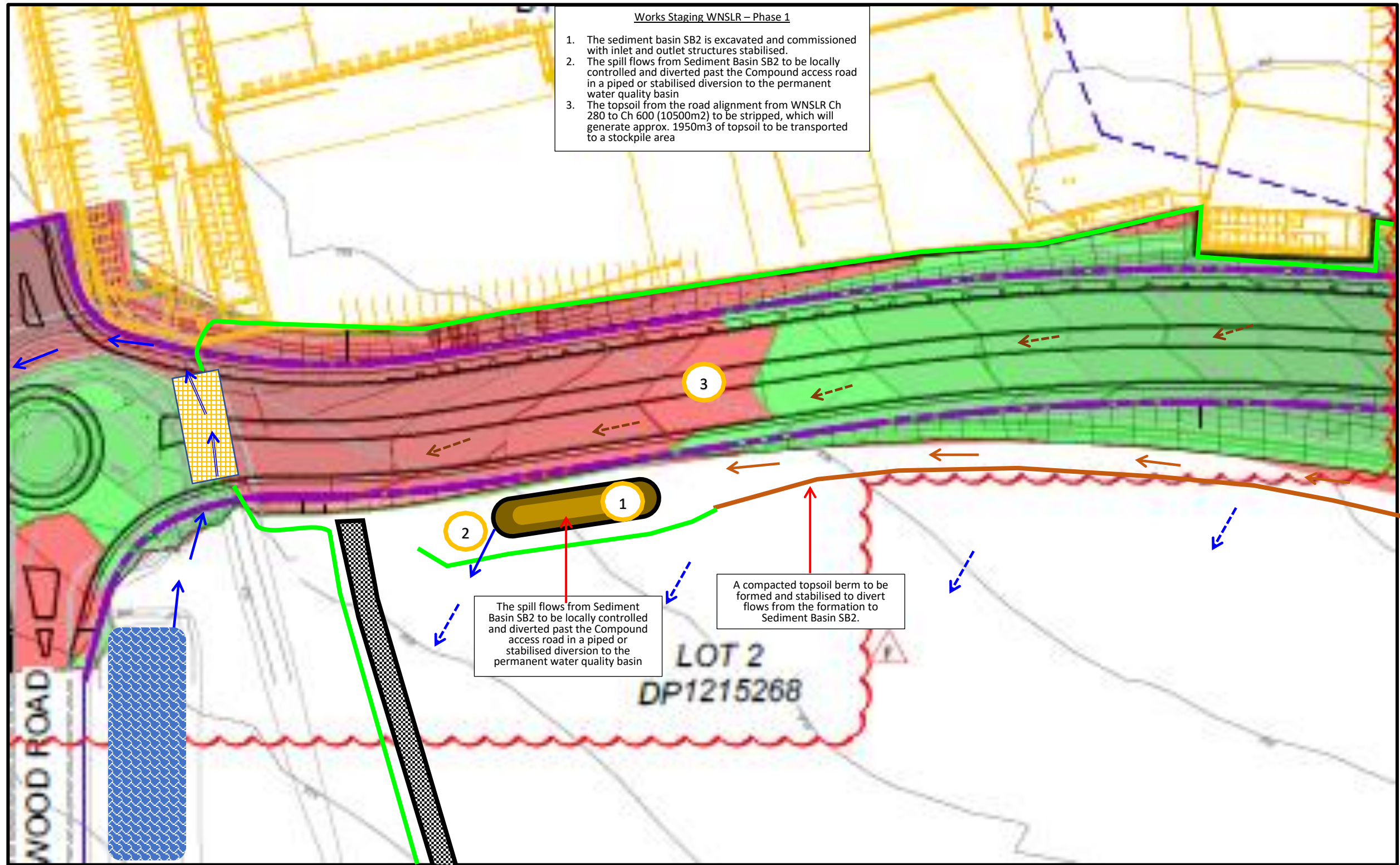
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Stage A, Phase 2 – Topsoil stripping and early earthworks – Sydney Water to WNSLR Ch 600.

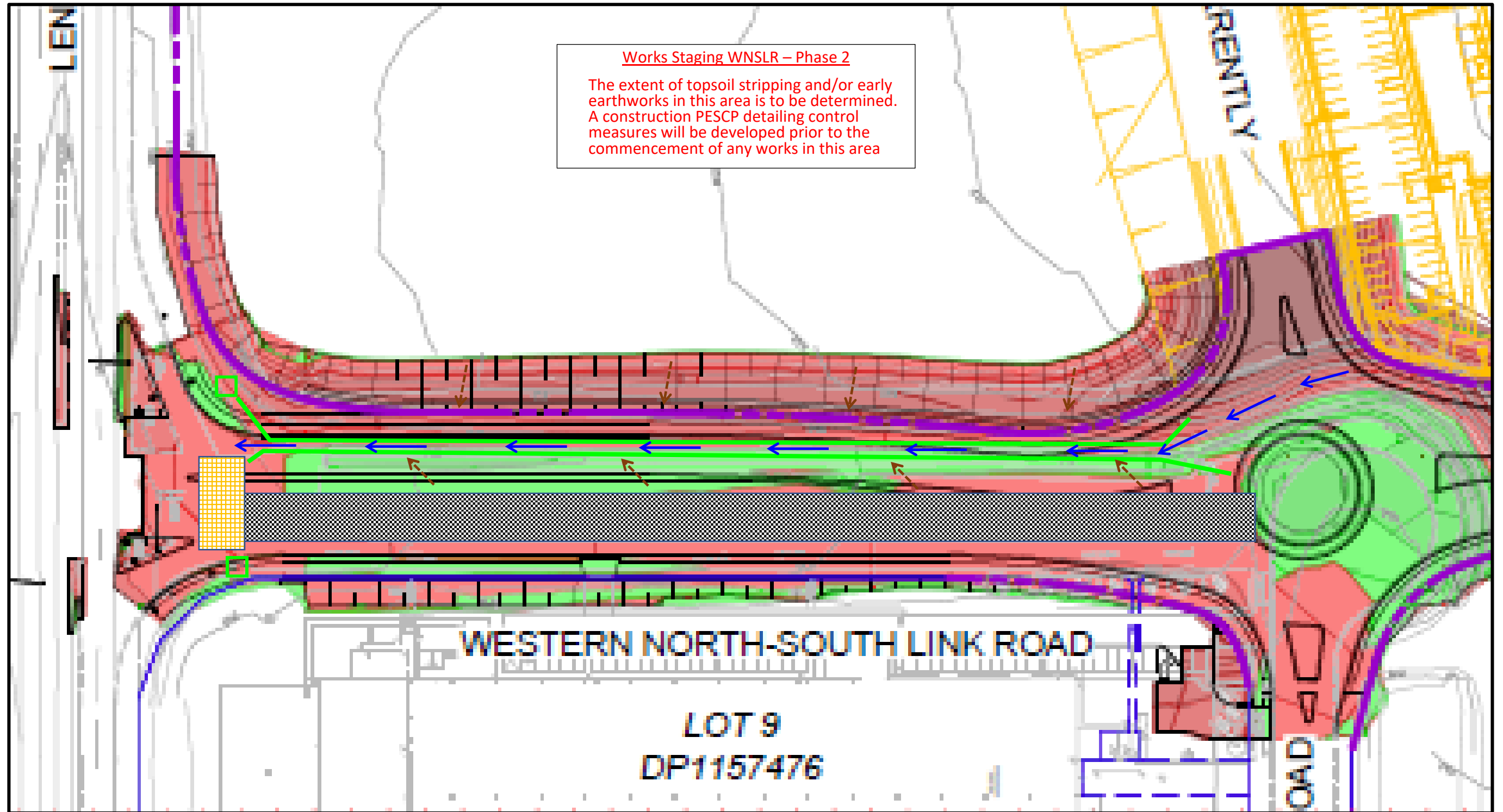


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Stage A, Phase 2 – Topsoil stripping and early earthworks: Ch550 to Lockwood Road Roundabout

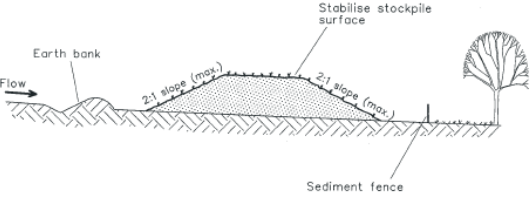
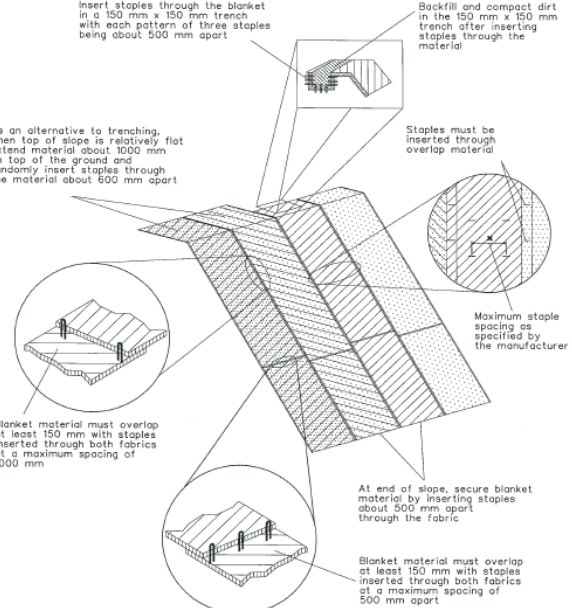
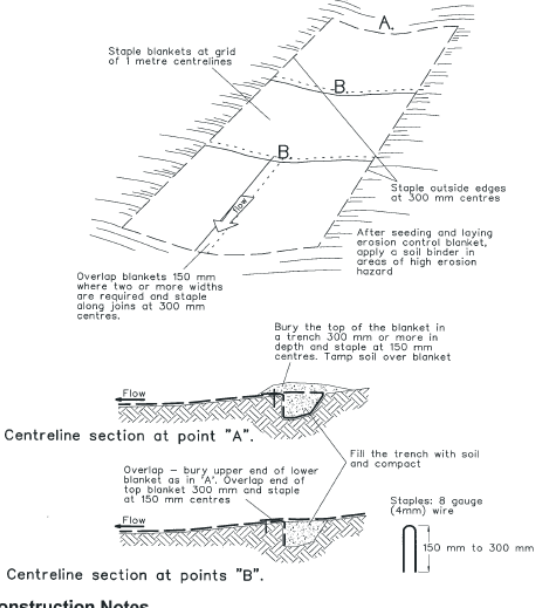
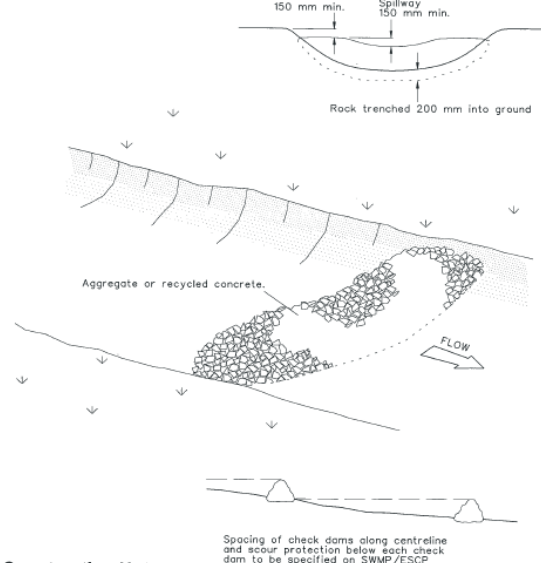
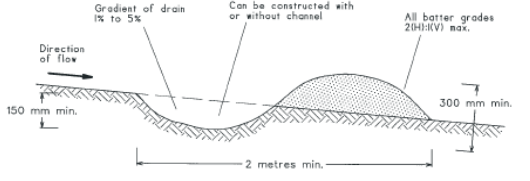
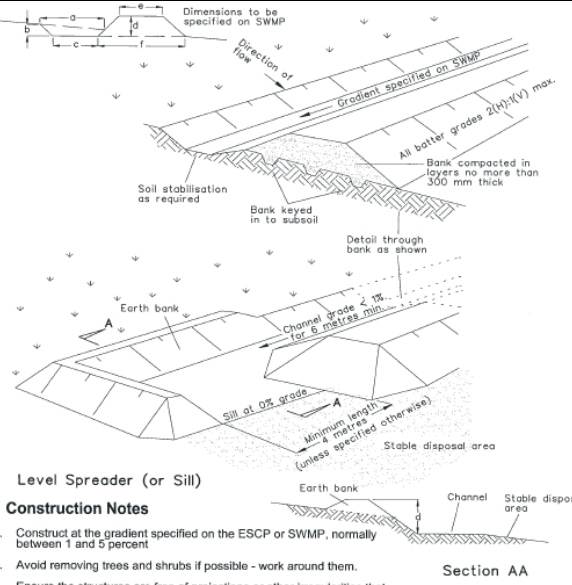
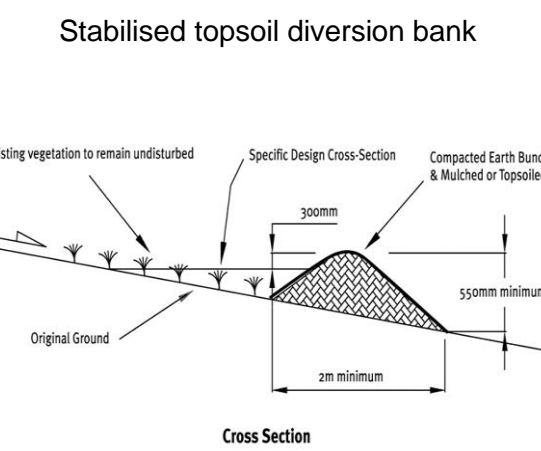
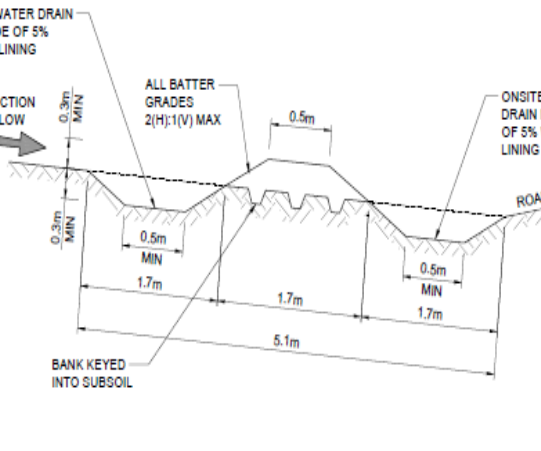


Legend											
Off Site Water – Sheet Flows		Piped Drainage		Stabilised Topsoil Berm (geo/jute/seed)		Sediment basin / large sump		Sediment Fence Geotextile Apron		Vegetated filter	
Off Site Water – Concentrated Flow/Drain		Off-site & onsite water cross-over		Geo-lined drain		Filter bag sediment trap		Mulch bund		Stabilised site access / Shaker / Wheelwash	
On Site Water - Concentrated Flow/Drain		'Off site' water exclusion bank		Rock lined drain		Compacted Mulch / Rock & Geotextile / topsoil sediment trap		Coir Log / Straw bale filter		Stabilised Haul Road/Access Track/ Piling pad/Piped crossing	
On Site Water – Sheet Flows		Level Spreader / Diffuser/ Geo spillway		Coarse rock / sandbag check dam		Excavated sediment trap with spill weir		Filter bag or sediment fence inlet filter		Temporary Traffic Barriers	

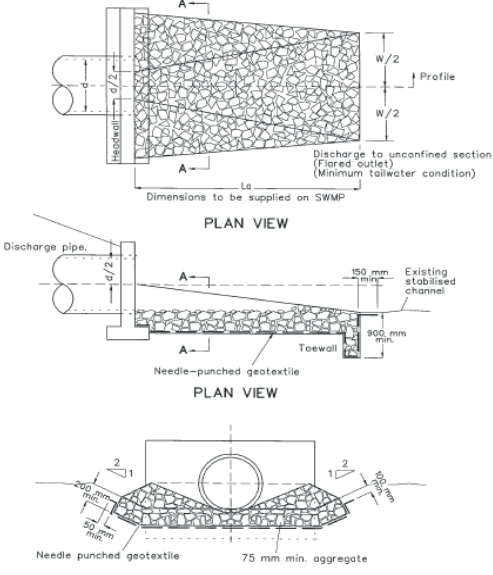
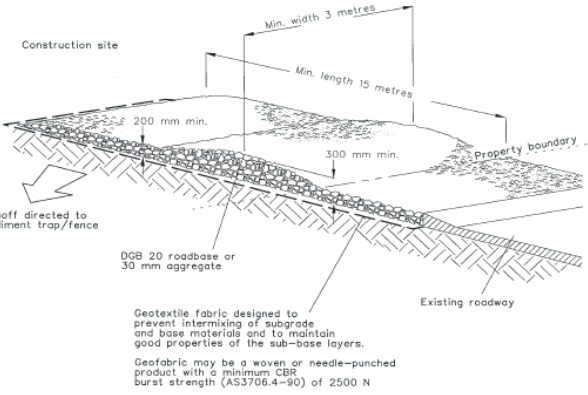
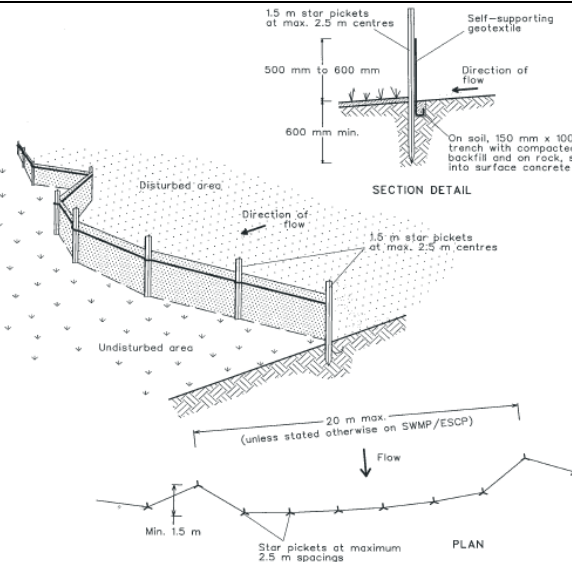
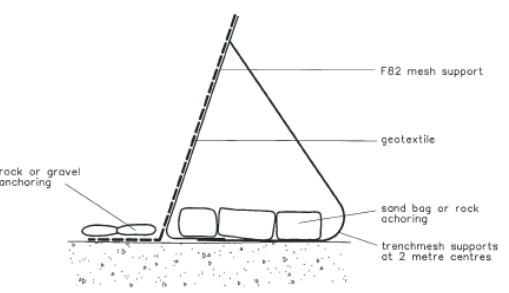
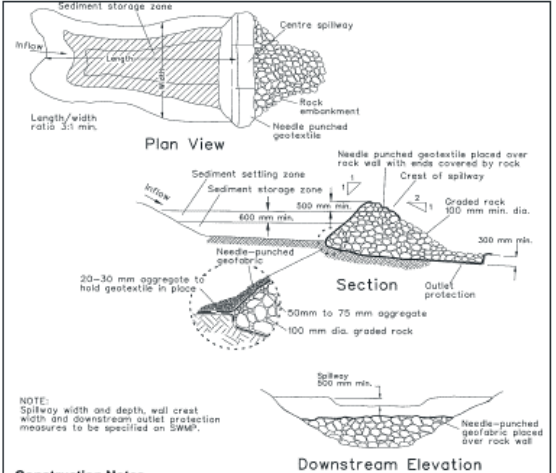
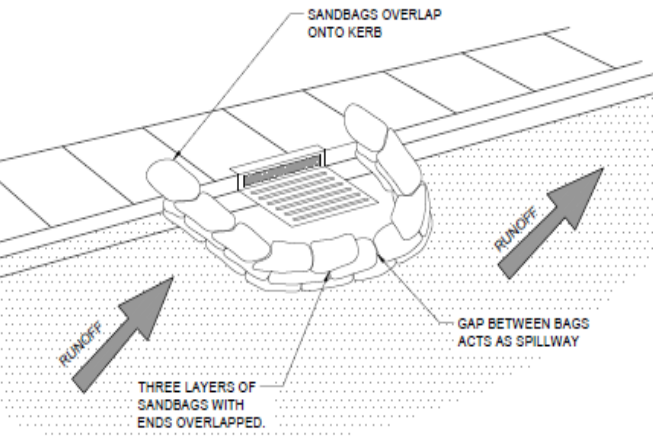
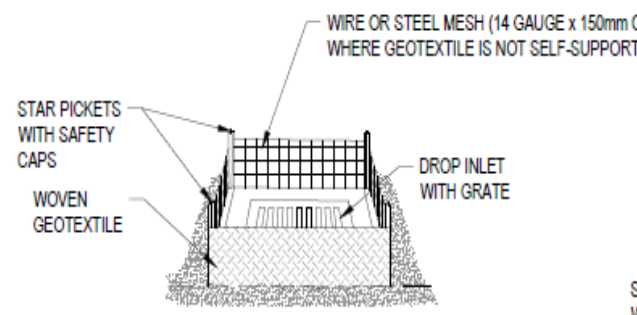
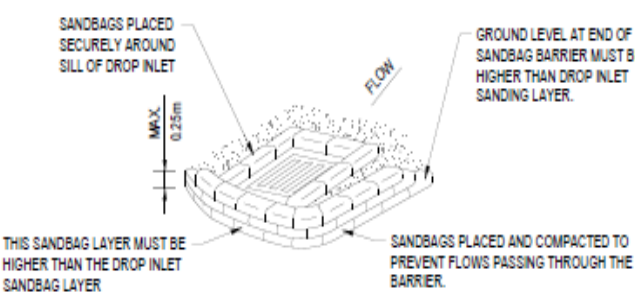


Legend											
Off Site Water – Sheet Flows		Piped Drainage		Stabilised Topsoil Berm (geo/jute/seed)		Sediment basin / large sump		Sediment Fence Geotextile Apron		Vegetated filter	
Off Site Water – Concentrated Flow/Drain		Off-site & onsite water cross-over		Geo-lined drain		Filter bag sediment trap		Mulch bund		Stabilised site access / Shaker / Wheelwash	
On Site Water - Concentrated Flow/Drain		'Off site' water exclusion bank		Rock lined drain		Compacted Mulch / Rock & Geotextile / topsoil sediment trap		Coir Log / Straw bale filter		Stabilised Haul Road/Access Track/ Piling pad/Piped crossing	
On Site Water – Sheet Flows		Level Spreader / Diffuser/ Geo spillway		Coarse rock / sandbag check dam		Excavated sediment trap with spill weir		Filter bag or sediment fence inlet filter		Temporary Traffic Barriers	

Standard Drawings

 <p>Construction Notes</p> <ol style="list-style-type: none"> Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas. Construct on the contour as low, flat, elongated mounds. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope. 	 <p>Construction Notes</p> <ol style="list-style-type: none"> Remove any rocks, clods, sticks or grass from the ground surface before laying the matting. Spread topsoil to at least 75 mm depth. Where appropriate, complete fertilising and seeding on a properly prepared seedbed (Standard Drawing 7-1) before laying the matting. Ensure the fabric can be continuously in contact with the soil by grading the surface carefully first. Lay the matting in "shingle-fashion" with the ends of each upstream roll overlapping the next roll downslope. Ensure sufficient staples are used to maintain a good contact between the soil and the matting. 	 <p>Construction Notes</p> <ol style="list-style-type: none"> Remove any rocks, clods, sticks or grass from the surface before laying matting Ensure that topsoil is at least 75 mm deep. Complete fertilising and seeding before laying the matting. Ensure fabric will be continuously in contact with the soil by grading the surface carefully first. Lay the fabric in "shingle-fashion", with the end of each upstream roll overlapping those downstream. Ensure each roll is anchored properly at its upslope end (Standard Drawing 5-7b). Ensure that the full width of flow in the channel is covered by the matting up to the design storm event, usually in the 10-year ARI time of concentration storm event. Divert water from the structure until vegetation is stabilised properly. 	 <p>Construction Notes</p> <ol style="list-style-type: none"> Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.
<p>STOCKPILES SD 4-1</p>  <p>Construction Notes</p> <ol style="list-style-type: none"> Build with gradients between 1 percent and 5 percent. Avoid removing trees and shrubs if possible - work around them. Ensure the structures are free of projections or other irregularities that could impede water flow. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped. Ensure the banks are properly compacted to prevent failure. Complete permanent or temporary stabilisation within 10 days of construction. 	<p>RECP : SHEET FLOW SD 5-2</p>  <p>Construction Notes</p> <ol style="list-style-type: none"> Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent Avoid removing trees and shrubs if possible - work around them. Ensure the structures are free of projections or other irregularities that could impede water flow. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP. Ensure the banks are properly compacted to prevent failure. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004). Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments. 	<p>RECP : CONCENTRATED FLOW SD 5-7</p> <p>Stabilised topsoil diversion bank</p> 	<p>ROCK CHECK DAM SD 5-4</p>  <p>Construction Notes</p> <ol style="list-style-type: none"> CONSTRUCT WITH GRADIENT OF 1% TO 5%. Avoid removing trees and shrubs if possible - WORK AROUND THEM DRAINS TO BE CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED. EARTH BANK TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE. PERMANENT OR TEMPORARY STABILISATION OF THE EARTH BANK TO BE COMPLETED WITHIN 10 DAYS OF CONSTRUCTION. ALL OUTLETS FROM DISTURBED LANDS ARE TO BE FED INTO A SEDIMENT BASIN OR SIMILAR. DISCHARGE RUNOFF COLLECTION FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL SITE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED. COMPACT BANK WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS. EARTH BANK TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

Standard Drawings

 <p>Construction Notes</p> <ol style="list-style-type: none"> 1. Compact the subgrade fill to the density of the surrounding undisturbed material. 2. Prepare a smooth, even foundation for the structure that will ensure that the needle-punched geotextile does not sustain serious damage when covered with rock. 3. Should any minor damage to the geotextile occur, repair it before spreading any aggregate. For repairs, patch one piece of fabric over the damage, making sure that all joints and patches overlap more than 300 mm. 4. Lay rock following the drawing, according to Table 5.2 of Landcom (2004) and with a minimum diameter of 75 mm. 5. Ensure that any concrete or riprap used for the energy dissipater or the outlet protection conforms to the grading limits specified on the SWMP. <p>ENERGY DISSIPATER SD 5-8</p>	 <p>Construction Notes</p> <ol style="list-style-type: none"> 1. Strip the topsoil, level the site and compact the subgrade. 2. Cover the area with needle-punched geotextile. 3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate. 4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide. 5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence <p>STABILISED SITE ACCESS SD 6-14</p>	 <p>Construction Notes</p> <ol style="list-style-type: none"> 1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event. 2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched. 3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps. 4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory. 5. Join sections of fabric at a support post with a 150-mm overlap. 6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile. <p>SEDIMENT FENCE SD 6-8</p>	 <p>Construction Notes</p> <ol style="list-style-type: none"> 1. Install this type of sediment fence when use of support posts is not desirable or not possible. Such conditions might apply, for example, where approval is granted from the appropriate authorities to place these fences in highly sensitive estuarine areas. 2. Use bent trench mesh to support the F82 welded mesh facing as shown on the drawing above. Attach the geotextile to the welded mesh facing using UV resistant cable ties. 3. Stabilise the whole structure with sandbag or rock anchoring over the trench mesh and the leading edge of the geotextile. The anchoring should be sufficiently large to ensure stability of the structure in the design storm event, usually the 10 year event. <p>ALTERNATIVE SEDIMENT FENCE SD 6-9</p>
 <p>Construction Notes</p> <ol style="list-style-type: none"> 1. Remove all vegetation and topsoil from under the dam wall and from within the storage area. 2. Excavate to 300 mm depth for base of the dam wall. 3. Line the excavation with a needle-punched geotextile allowing sufficient to line below the wall, and over the upstream rock and the spillway to 500 mm below the spillway exit on the downstream face. 4. Make up the wall profile and outlet protection with 100 mm (min.) diameter graded rock. Spread a layer of 50 mm to 75 mm diameter aggregate over the upstream batter for a more even surface, and add 100 mm to 150 mm of 20 mm to 30 mm gravel over the 50 mm to 75 mm diameter aggregate. 5. Lay geotextile over the upstream batter and through the spillway, fixing in place with 100 mm rock. 6. Place a 'Full of Sediment' marker to show when less than design capacity occurs and sediment removal is required. 7. Replace the upstream geotextile layer each time sediment is removed <p>ROCK SEDIMENT BASIN SD 6-1 (APPLIES TO TYPE C SOILS ONLY)</p>	 <p>SANDBAG SEDIMENT TRAP FOR KERB INLET N.T.S.</p>	 <p>GEOTEXTILE INLET FILTER (SD 6-12) - PERSPECTIVE NTS</p>	 <p>SEDIMENT BARRIER (SD 5-4) DETAIL</p>

Standard Drawings

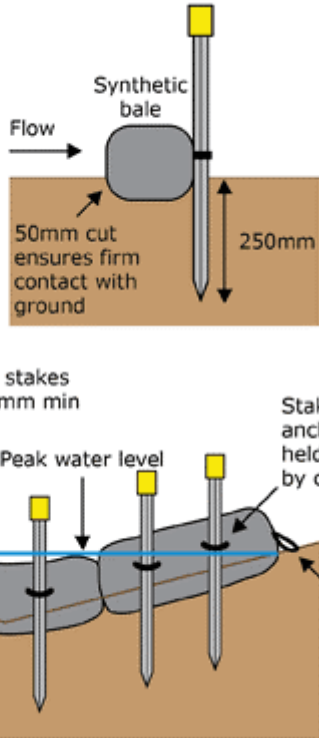
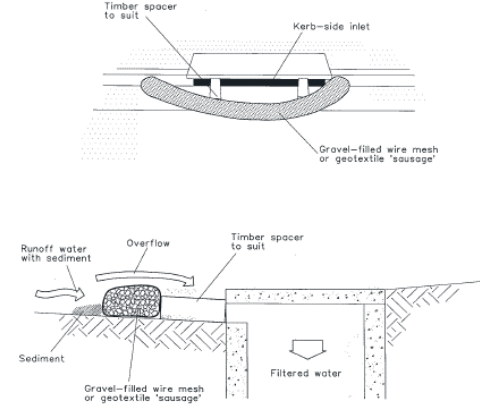
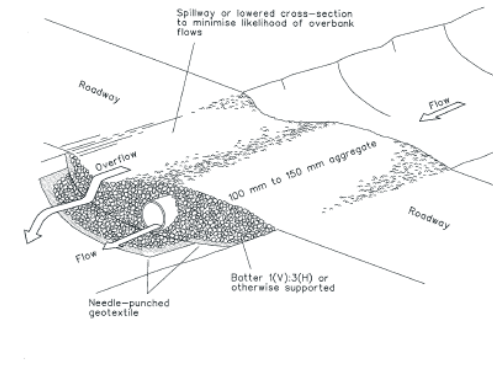
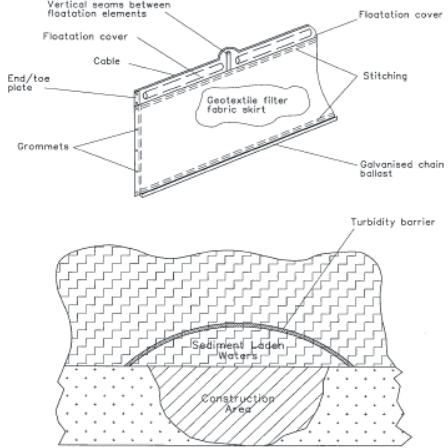
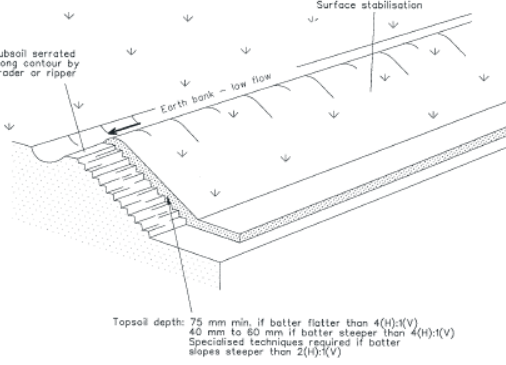
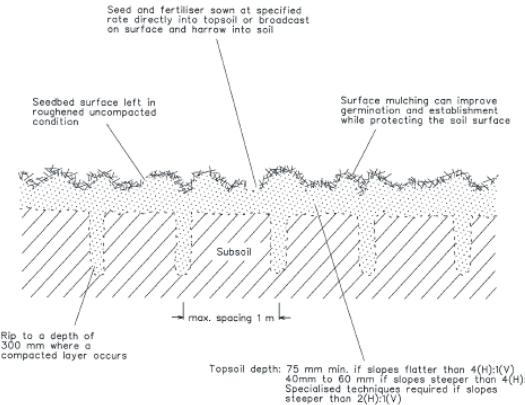
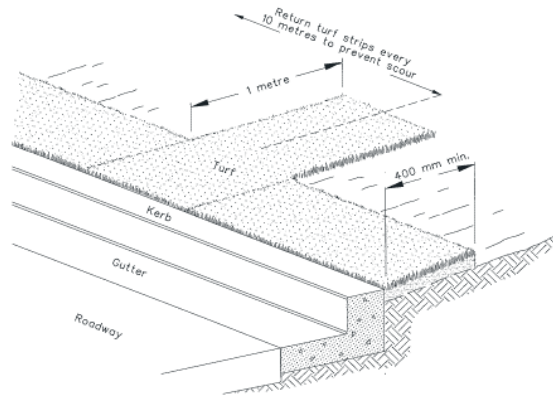
<div><h3>Coir Log Filter</h3><p>Flow</p><p>Synthetic bale</p><p>50mm cut ensures firm contact with ground</p><p>250mm</p><p>Star pickets / wooden stakes 35mm x 38mm x 900mm min Minimum 2 per bale</p><p>Peak water level</p><p>Stakes through anchor straps held in place by cable ties</p><p>Anchor straps pinned to ground with U pins</p><p>Construction Notes</p><ol style="list-style-type: none">1. Construct the straw bale filter as close as possible to being parallel to the contours of the site.2. Place bales lengthwise in a row with ends tightly abutting. Use straw to fill any gaps between bales. Straws are to be placed parallel to ground.3. Ensure that the maximum height of the filter is one bale.4. Embed each bale in the ground 75 mm to 100 mm and anchor with two 1.2 metre star pickets or stakes. Angle the first star picket or stake in each bale towards the previously laid bale. Drive them 600 mm into the ground and, if possible, flush with the top of the bales. Where star pickets are used and they protrude above the bales, ensure they are fitted with safety caps.5. Where a straw bale filter is constructed downslope from a disturbed batter, ensure the bales are placed 1 to 2 metres downslope from the toe.6. Establish a maintenance program that ensures the integrity of the bales is retained - they could require replacement each two to four months.</div> <div><h3>STRAW BALE FILTER</h3><p>SD 6-7</p></div>	<div><p>Timber spacer to suit</p><p>Kerb-side inlet</p><p>Gravel-filled wire mesh or geotextile 'sausage'</p><p>Runoff water with sediment</p><p>Overflow</p><p>Sediment</p><p>Filtered water</p><p>NOTE: This practice only to be used where specified in an approved SWMP/ESCP.</p><p>Construction Notes</p><ol style="list-style-type: none">1. Install filters to kerb inlets only at sag points.2. Fabricate a sleeve made from geotextile or wire mesh longer than the length of the inlet pit and fill it with 25 mm to 50 mm gravel.3. Form an elliptical cross-section about 150 mm high x 400 mm wide.4. Place the filter at the opening leaving at least a 100-mm space between it and the kerb inlet. Maintain the opening with spacer blocks.5. Form a seal with the kerb to prevent sediment bypassing the filter.6. Sandbags filled with gravel can substitute for the mesh or geotextile providing they are placed so that they firmly abut each other and sediment-laden waters cannot pass between.</div> <div><h3>MESH AND GRAVEL INLET FILTER</h3><p>SD 6-11</p></div>	<div><p>Spillway or lowered cross-section to minimise likelihood of overbank flows</p><p>Roadway</p><p>Overflow</p><p>Flow</p><p>100 mm to 150 mm aggregate</p><p>Needle-punched geotextile</p><p>Batter 1(V):3(H) or otherwise supported</p><p>Construction Notes</p><ol style="list-style-type: none">1. Prohibit all traffic until the access way is constructed.2. Strip any topsoil and place a needle-punched textile over the base of the crossing.3. Place clean, rigid, non polluting aggregate or gravel in the 100 mm to 150 mm size class over the fabric to a minimum depth of 200 mm.4. Provide a 3-metre wide carriageway with sufficient length of culvert pipe to allow less than a 3(H): 1 (V) slope on side batters.5. Install a lower section to act as an emergency spillway in greater than design storm events.6. Ensure that culvert outlets extend beyond the toe of fill embankments.</div> <div><h3>TEMPORARY WATERWAY CROSSING</h3><p>SD 5-1</p></div>	
<div><p>Vertical seams between floatation elements</p><p>Floatation cover</p><p>Cable</p><p>End/toe plate</p><p>Geotextile filter fabric skirt</p><p>Stitching</p><p>Grommets</p><p>Galvanised chain ballast</p><p>Turbidity barrier</p><p>Sediment laden Waters</p><p>Construction Area</p><p>Construction Notes</p><ol style="list-style-type: none">1. Use turbidity barriers only where high flows are unlikely to remove accumulated sediment and/or move the curtain significantly.2. Where the barrier is to remain in place for more than one month, ensure the floatation cover is a UV-resistant, durable material.3. Use only closed cell foam or foam-filled PVC piping as floatation elements. Do not use unfilled pipes.4. Use only woven or heat-set non woven geotextiles. Needle-punched, non woven geotextiles can become fouled with debris that fray and delaminate them as they move with the waves or currents.5. Remove captured sediment before the barrier is decommissioned.6. In tidal areas, ensure the barrier can rise and fall without being moved from its position.</div> <div><h3>TURBIDITY BARRIER</h3><p>SD 6-10</p></div>	<div><p>Subsoil serrated along contour by grader or ripper</p><p>Earth bank - low flow</p><p>Surface stabilisation</p><p>Topsoil depth: 75 mm min. if batter flatter than 4(H):3(V) 40 mm to 60 mm if batter steeper than 4(H):1(V) Specialised techniques required if batter slopes steeper than 2(H):1(V)</p><p>Construction Notes</p><ol style="list-style-type: none">1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.2. Add soil ameliorants as required by the ESCP or SWMP.3. Rip to a depth of 300 mm if compacted layers occur.4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.</div> <div><h3>REPLACING TOPSOIL</h3><p>SD 4-2</p></div>	<div><p>Seed and fertiliser sown at specified rate directly into topsoil or broadcast on surface and harrow into soil</p><p>Seedbed surface left in roughened uncompacted condition</p><p>Surface mulching can improve germination and establishment while protecting the soil surface</p><p>Subsoil</p><p>max. spacing 1 m</p><p>Rip to a depth of 300 mm where a compacted layer occurs</p><p>Topsoil depth: 75 mm min. if slopes flatter than 4(H):3(V) 40mm to 60 mm if slopes steeper than 4(H):1(V) Specialised techniques required if slopes steeper than 2(H):1(V)</p><p>Construction Notes</p><ol style="list-style-type: none">1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.3. Avoid cultivation in very wet or very dry conditions.4. Cultivate on or close to the contour where possible, not up and down the slope.</div> <div><h3>SEEDBED PREPARATION</h3><p>SD 7-1</p></div>	<div><p>Return turf strips every 10 metres to prevent scour</p><p>1 metre</p><p>Turf</p><p>Kerb</p><p>Gutter</p><p>Roadway</p><p>400 mm min.</p><p>Construction Notes</p><ol style="list-style-type: none">1. Install a 400-mm minimum wide roll of turf on the footpath next to the kerb and at the same level as the top of the kerb.2. Lay 1.4 metre long turf strips normal to the kerb every 10 metres.3. Rehabilitate disturbed soil behind the</div> <div><h3>KERBSIDE TURF STRIP</h3><p>SD 6-13</p></div>

Photo examples of topsoil sediment traps with geotextile spillways



Stage 1 - Topsoil formed in a compacted formation with spillway cut.



Stage 2 - The topsoil spillway area has been covered with pinned geotextile with plastic underlay, and scour rock.





Appendix B

Water Quality Monitoring Program

NOTE: NO RIVERS OR STREAMS ARE PRESENT WITHIN THE WESTERN NORTH SOUTH LINK PROJECT CORRIDOR. FOR WATER QUALITY MONITORING OF SEDIMENT BASIN DISCHARGES PLEASE REFER TO APPENDIX A EROSION AND SEDIMENT CONTROL PLAN

APPENDIX N

Salinity Management Plan



Our Ref: PSM1541-125L

18 November 2015

Goodman Property Services (Aust) Pty Ltd
Level 17, 60 Castlereagh Street
SYDNEY NSW 2000

ATTENTION: KYM DRACOPOULOS
kym.dracopoulos@goodman.com

Dear Kym

RE: OAKDALE WEST PRECINCT – SALINITY MANAGEMENT PLAN

1 INTRODUCTION

This letter presents a Salinity Management Plan (SMP) prepared by Pells Sullivan Meynink (PSM) for Oakdale West Precinct. This was prepared to accompany our salinity investigation in accordance with our proposal (ref. PSM1541-116L Rev1 dated 9 October 2015).

The aim of the SMP is to provide controls for the potential impacts of the proposed development on site salinity and has been prepared in accordance with WSROC Salinity Code of Practice (2004) salinity management guidelines.

2 DOCUMENTS RELIED UPON

In preparing the SMP, we have taken into consideration:

1. The results of the salinity assessment completed by PSM and presented in our letter (Ref. PSM 1541-125L).
2. Details of the proposed developments as presented in the “*Oakdale West Optimised Masterplan Cut/Fill Plan*” by AT&L (ref. SKC051 15-272 issue P1 dated 2 June 2015).
3. WSROC Salinity Code of Practice (2004) salinity management guidelines.

3 OBJECTIVE OF SMP

The objective of this SMP is to effectively manage site salinity, to minimise the effect of the proposed development on the salinity processes and to protect the proposed development from salinity damage.

4 SALINITY ASSESSMENT

The PSM salinity assessment noted that:

1. The soils present on site are sodic to highly sodic.
2. The soils present on site are non-saline to slightly saline.

5 RECOMMENDATIONS

5.1 Development components

This SMP addresses the components of the proposed development at both the construction stage and for the permanent works. Recommendations regarding the following development components are provided in the following sections:

1. Earthworks
2. Gardens and landscaped areas
3. Roads, footpaths and hardstand areas
4. Surface water, stormwater and drainage
5. Detention basins
6. Durability of concrete structures in contact with the ground
7. Masonry structures
8. Groundwater management.

5.2 Earthworks

We understand that the development will be sympathetic to the site topography and the environment and thus aim to minimise the cut and fill. The design and construction of the earthworks should consider the following recommendations:

1. Vegetation cover should be established and maintained on permanent batters as soon as practical upon completion to control erosion.
2. The final surface of all areas of the development should be graded to prevent the ponding of surface water.
3. Subsoil drainage should be considered for areas where the designer considers accumulation of groundwater may occur. We do not consider that any significant such areas are likely at this site.
4. Erosion control of temporary batters, stockpiles and disturbed areas should be planned prior to undertaking the earthworks and implemented during the earthworks. Consideration should be given to:
 - a. Grading and sealing partially completed surfaces.
 - b. Installation of clearly visible fencing and traffic control measures to prevent unnecessary trafficking of areas and ensuing site disturbance.
 - c. Establishing set vehicular access points and roads.
 - d. Protecting stockpiles (temporary vegetation or mulching) where these are to be left in place for long durations.
5. Sediment control shall be implemented by means of sediment traps and silt fencing where considered necessary.
6. Where for landscaping purposes or erosion control the designer requires gypsum or lime stabilisation, these should be planned to be undertaken as part of the initial earthworks.

5.3 Gardens and landscaped areas

The proposed development will result in the majority of the site comprising roads, footpaths, and hardstand areas. Garden and landscaped areas are likely to be of limited extent. The design and construction of the gardens and landscaped areas should consider the following recommendations:

1. Where possible areas of established vegetation, particularly large trees, should be retained.
2. Selection of plant species should consider the soil conditions, including moderate salinity, relatively poor fertility and clayey low permeability soil profiles. Promotion of successful revegetation is likely to require use of nutrient rich topsoil. Saline topsoils should not be imported to site.

3. Recharge of groundwater and potential for water logging should be minimised by:
 - a. Adopting plant species with minimal watering requirements.
 - b. Adopting 'waterwise' gardening principles.
 - c. Minimising use of potable water in landscaped areas.
 - d. Properly designed and implemented irrigation systems.
 - e. Establishment of perennial species and deep rooted trees.

5.4 Roads, footpaths and hardstand areas

As stated, the proposed development will result in the majority of the site comprising roads, footpaths, and hardstand areas. The design and construction of roads, footpaths and hardstand areas should consider the following recommendations:

1. Roads, footpath and hardstand surfaces should be graded and the grades maintained at all times to prevent ponding of surface water at locations where this can result in infiltration into the underlying soils (e.g. pavement joints).
2. Connections between the roads, footpath and hardstand surfaces and the surface water and stormwater drainage infrastructure should be designed, constructed and maintained to restrict infiltration into underlying soils.
3. Services that are to be located below the roads, footpath and hardstand surfaces should be installed, where practical, at the time of construction.

5.5 Surface water, stormwater and drainage

Surface water, stormwater and drainage design should aim at restricting infiltration into the ground resulting in groundwater recharge. The design and construction of surface water, stormwater and drainage measures should thus consider the following recommendations:

1. Disturbance of natural drainage patterns should be reduced. Where these are disturbed or altered appropriate artificial drainage should be installed.
2. Stormwater and surface water should be managed to restrict infiltration.
3. Temporary water retaining structures used during construction should be managed to restrict infiltration.
4. Stormwater and surface water infrastructure should be designed and constructed to minimise the likelihood of leakage.
5. Guttering and down pipes should be connected and maintained.
6. Surface water runoff should be directed around all exposed surfaces, temporary stockpiles and landscaped areas.

5.6 Detention basins

Detention basins should be designed such that recharge into the groundwater system is controlled. On this basis, the design of temporary and permanent on site detention will need to consider the requirement to line the basin with an impermeable liner (clay layer or synthetic liner) or simply vegetate the exposed base.

In assessing the above requirement the design will need to consider the proposed basin location, the subsurface conditions at the basin, the proximity of the basin to other structures, the proposed storage volume and storage depth and the likely duration of water storage.

In saline environments reducing the water infiltration into the soil and groundwater recharge is considered desirable. On this site, the majority of the site is to be developed with roads and paved areas thus significantly reducing surface water infiltration. The amount of infiltration that can be tolerated at the detention basins will need to be assessed in terms of the overall water balance on site.

Where ponds intended to be permanently full are proposed, such as recreational or aesthetic ponds or fountains, it is recommended that the base of the permanent pond be lined with an impermeable liner. The liner to be adopted (clay or synthetic) shall be a matter of design.

5.7 Durability of concrete structures in contact with the ground

In designing structural concrete elements in contact with the ground the design should consider the results of the salinity, sulphate, chloride and pH testing on the soil and groundwater and the durability requirements in AS2159:2009 and AS3600:2009.

Both these standards provide guidance on minimum concrete grade/strength and minimum cover requirements.

Based on the results of the salinity assessments it is recommended that:

1. The design of structural concrete members in contact with the ground (excluding piles) adopt an A2 exposure classification as defined in AS3600:2009.
2. The design of concrete cast in situ piles adopt a mild classification as defined in AS2159:2009.

5.8 Masonry structures

Having given consideration to the very low to moderate soil salinity on site, the relatively deep water table, and the low permeability soils present on site it is considered that the design and construction of masonry structures including damp proof courses, moisture barriers and selection of brick and construction materials should be undertaken in accordance with the relevant building industry standard. We do not expect special attention to salinity will be required.

5.9 Groundwater management

The intention of groundwater maintenance at this site is to reduce the likelihood of recharge of the groundwater resulting in rising of the groundwater table to near the ground surface.

The very low to moderate soil salinity on site, the relatively deep water table, and the low permeability soils combine to reduce the likelihood of a rising groundwater table. Further, the development involves a very significant reduction in infiltration over the site.

Furthermore, the recommendations in Section 5.3 to 5.6 regarding gardens and landscaped areas, roads, footpaths and hardstand areas, surface water, stormwater and drainage and detention basins are aimed at reducing the potential for groundwater recharge.

In addition to these recommendations, use of infiltration pits to disperse surface water should be avoided.

5.10 Importation of soil

It may be required to import topsoil or other soil onto site. Materials to be imported to site should be assessed for suitability for the intended use. Saline or contaminated soils should not be imported to site.

6 SIGN OFF

We recommend the following:

The designer and contractor responsible for construction of the various development components be required to sign-off their design and the as built, certifying that:

“The works have been designed/constructed having given appropriate consideration to the recommendations in the SMP (Ref. PSM1541-125L dated xxx)”.

The designer and contractors should contact PSM during the works if they have any queries with regards to the requirements in the SMP or if conditions significantly differ from those described in this SMP.

Please do not hesitate to contact the undersigned if you have any queries.

For and on behalf of
PELLS SULLIVAN MEYNINK



CHRISTOPHER FERNANDEZ
Geotechnical Engineer



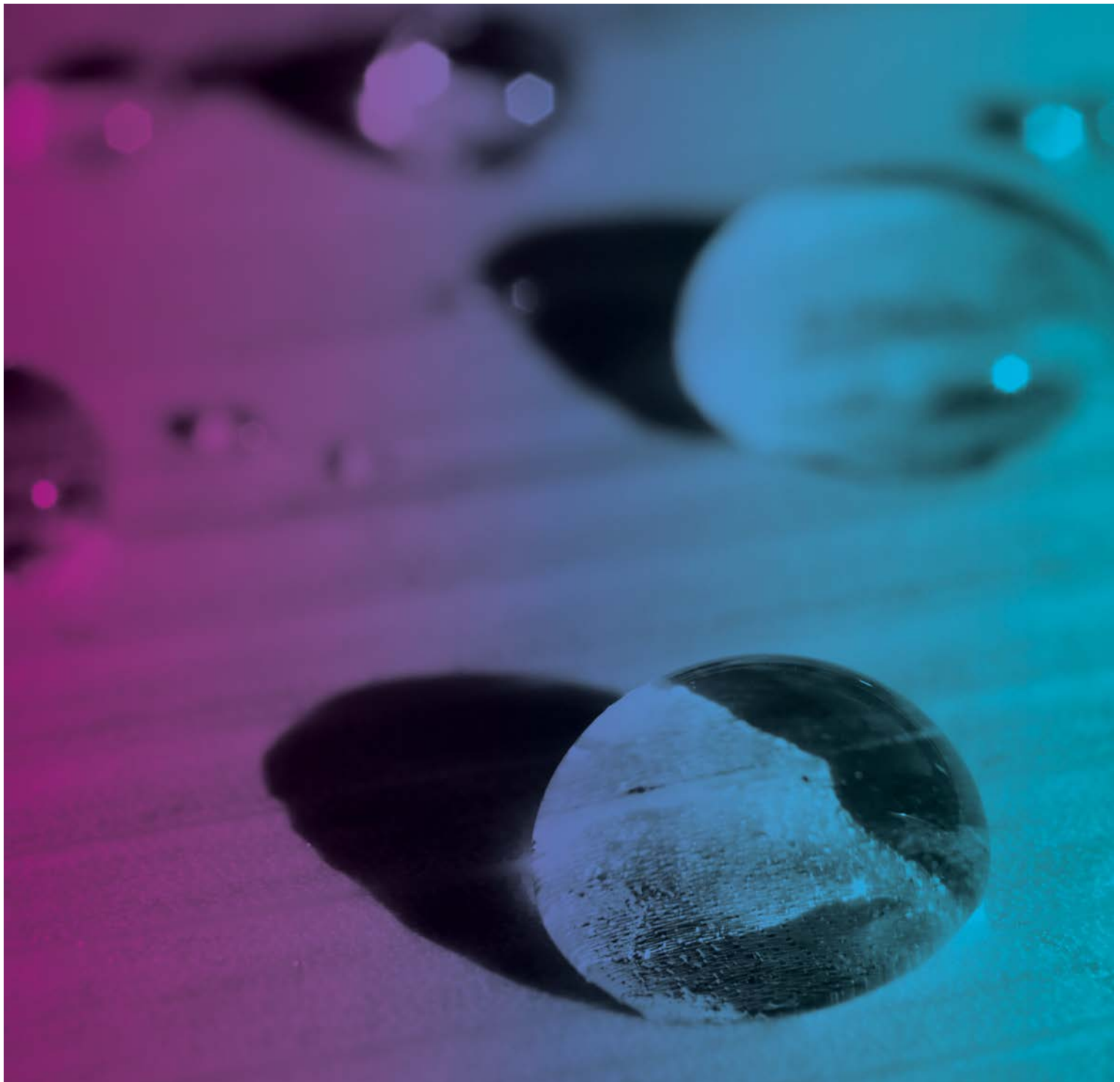
GARRY MOSTYN
Chief Engineer

APPENDIX O

Fill Importation Protocol

Fill Importation Protocol

Oakdale, Western North South Link Road



Fill Importation Protocol

Oakdale, Western North South Link Road

Client: Goodman Property Services (Aust) Pty Ltd

ABN: 40 088 981 793

Prepared by

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Quality Information

Document Fill Importation Protocol

Ref 60441214

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Prepared by Alex Latham

Reviewed by Clayton Cowper

Revision History


Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
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Glossary

General Terms	
ACM	Asbestos Containing Material
ASC NEPM	Assessment of Site Contamination National Environment Protection Measure (2013)
ASS / PASS	Acid Sulfate Soil / Potential Acid Sulfate Soil
BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
CEMP	Construction Environmental Management Plan
CoPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DQI	Data Quality Indicators
DQO	Data Quality Objectives
EC	Earthworks Contractor
ENM	Excavated Natural Material
EPA	Environment Protection Authority
FIP	Fill Importation Protocol
HIL	Health Investigation Level
HSL	Health Screening Level
LOR	Limit of Reporting
m bgs	Metres below ground surface
mg/kg	milligrams/kilogram
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
OCP	Organochlorine Pesticides
OPP	Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PID	Photoionisation detector
POEO	Protection of the Environment Operations (Regulation)
Priority metals	Arsenic, cadmium, copper, chromium, lead, mercury, nickel, zinc
QA/QC	Quality Assurance/Quality Control
RRO	Resource Recovery Order
TPH/TRH	Total Petroleum Hydrocarbons/Total Recoverable Hydrocarbons
UST/UPSS	Underground Storage Tank/Underground Petroleum Storage System
VENM	Virgin Excavated Natural Material
VHC	Volatile Halogenated Compound (or Chlorinated Hydrocarbons [CHC])
VOC	Volatile Organic Compound

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by Goodman Property Services (Aust) Pty Ltd (Goodman) to prepare this Fill Importation Protocol (FIP) for the Western North South Link Road (WNSLR)(the Site) at the Oakdale development, Horsley Park/Kemps Creek, NSW.

Goodman propose to construct the WNSLR under State Significant Development Application 7348 (SSDA 7348).

1.1 SSD Conditions of Consent

The SSD Conditions of Development Consent were issued to Goodman on 13 September 2019. With respect to soil contamination, these are summarised in the following table:

Table 1 Consent Requirements

Condition Requirement	Section / Comment
D79. The Applicant must prepare a Fill Importation Protocol for Stage 1. The protocol must form part of the CEMP required by condition D119 and must detail the measures to:	
a) Ensure only VENM, ENM, or other material approved in writing by EPA is brought onto the site;	Sections 1.2 to 1.6. Sections 2.1 to 2.9
b) Keep accurate records of the volume and type of fill to be used; and	Section 3.0 and completed in CEMP
c) make these records available to the Department on request	Section 3.0 and completed in CEMP
Management Plan Requirement	Section / Comment
D118. Management plans required under this consent must be prepared in accordance with relevant guidelines and include:	
a) details of: <ul style="list-style-type: none"> i. the relevant statutory requirements (including any relevant approval, licence or lease conditions); ii. any relevant limits or performance measures and criteria; and iii. the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; 	Sections 1.2 to 1.6. Sections 2.1 to 2.9
b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Sections 2.1 to 2.9
c) a program to monitor and report on the: <ul style="list-style-type: none"> i. impacts and environmental performance of Stage 1; and ii. effectiveness of the management measures set out pursuant to paragraph (b) above; 	Section 2.7 and Section 3
d) 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;	The protocols in this FIP apply. Should testing data indicate that any materials that are imported to Site are not suitable for use, the Earthworks Contractor (or entity responsible for the importation) will be responsible for the removal of the material from site.

Condition Requirement	Section / Comment
e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time;	Completed in CEMP
f) a protocol for managing and reporting any: <ul style="list-style-type: none"> i. incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); ii. complaint; iii. failure to comply with statutory requirements; and 	Completed in CEMP
g) a protocol for periodic review of the plan.	Completed in CEMP
D119. The Applicant must prepare a CEMP for Stage 1, including the WNSLR, in accordance with the requirements of Condition D118 and to the satisfaction of the Planning Secretary	This FIP will be incorporated into the Construction Environmental Management Plan prepared by SLR Consulting Australia Pty Ltd.

Goodman requires the implementation of a FIP to comply with the Conditions of Development Consent and to ensure that materials imported to the Site are suitable for use in a roadway, assumed to be consistent with commercial/industrial land use. It is understood that the WNSLR will be dedicated to Penrith City Council (PCC). Therefore, any materials imported to Site must also meet any additional requirements stipulated by PCC.

Condition of Consent D79 states that materials imported to Site must be any of the following:

- Excavated Natural Material (ENM).
- Virgin Excavated Natural Material (VENM).
- Other material approved in writing by EPA. AECOM note that this may include:
 - Recycled concrete aggregate that meet the requirements of the NSW EPA Resource Recovery Order under part 9, clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – the Recovered Aggregate Order 2014.
 - Basalt fines (maximum particle size of 9.5 mm) that meet the requirements of the NSW EPA Resource Recovery Order under part 9, clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – the Basalt Fines Order 2014.
 - Recycled glass sands that meet the requirements of the NSW EPA Resource Recovery Order under part 9, clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – the Recovered Glass Sand Order 2014.

1.2 ENM

ENM is defined in the Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – The excavated natural material order 2014 - as naturally occurring rock and soil that has:

- Been excavated from the ground, and
- Contains at least 98% (by weight) natural material, and
- Does not meet the definition of Virgin Excavated Natural Material in the Act.

ENM **does not include:**

- Material located in a hotspot.
- Material that has been processed.
- Material that contains asbestos, acid sulfate soil (ASS), potential acid sulfate soil (PASS) or sulfidic ores.

The ENM Order is provided in **Appendix A**.

1.3 VENM

The Protection of the Environment Operations Act 1997 (POEO Act) defines VENM as natural material that:

- Has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities.
- Does not contain any sulfidic ores or soils or any other waste.
- Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.

To be classified as VENM, materials must satisfy all aspects of the above definition.

1.4 Recovered Aggregate Order

The requirements of the Recovered Aggregate Order 2014 apply to the supply of recovered (i.e. recycled) aggregate for application to land as road making material, or in building, landscaping or construction works.

In the Recovered Aggregate Order 2014, recovered aggregate means material comprising of concrete, brick, ceramics, natural rock and asphalt processed into an engineered material. This does not include refractory materials, or asphalt that contains coal tar.

The Recovered Aggregate Order 2014 is provided in **Appendix A**.

1.5 Basalt Fines Order

The requirements of the Basalt Fines Order 2014 apply to the supply of basalt fines for application to land for building or maintaining railway infrastructure, for road making activities, or as a soil amendment.

In the Basalt Fines Order 2014, basalt fines means a material comprising of naturally excavated basalt with a maximum particle size of 9.5 mm, that is derived from the processing of basalt or the recycling of railway ballast.

The Basalt Fines Order 2014 is provided in **Appendix A**.

1.6 Glass Sand Order

The requirements of the Recovered Glass Sand Order 2014 apply to the supply of recovered glass sand for application to land for the purpose of pipe bedding, drainage or for road making activities.

In the Recovered Glass Sand Order 2014, recovered glass sand means recovered glass that has been processed to produce a 'sand-like' glass material with a particle size diameter generally less than 5 mm and that contains at least 98% recovered glass.

The Recovered Glass Sand Order 2014 is provided in **Appendix A**.

2.0 Assessment Requirements

2.1 ENM

To assess that materials meet the ENM classification, the requirements presented in **Appendix A** shall apply. In summary, the following are applicable.

Table 2 Chemicals & Concentrations

Attributes	Maximum Average Concentration (mg/kg)	Absolute Maximum Concentration (mg/kg)
1. Mercury	0.5	1
2. Cadmium	0.5	1
3. Lead	50	100
4. Arsenic	20	40
5. Chromium (total)	75	150
6. Copper	100	200
7. Nickel	30	60
8. Zinc	150	300
9. Electrical conductivity	1.5 dS/m	3 dS/m
10. pH	5 to 9	4.5 to 10
11. Total Polycyclic aromatic hydrocarbons (PAH)	20	40
12. Benzo(a)pyrene	0.5	1
13. Benzene	NA	0.5
14. Toluene	NA	65
15. Ethylbenzene	NA	25
16. Xylene	NA	15
17. Total petroleum hydrocarbons C10-C36	250	500
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05 %	0.1 %
19. Asbestos	Not detected	Not detected

Notes:

Items 1 to 18 sourced from **Table 4** in the ENM exemption (refer **Appendix A**).

Item 19 added by AECOM.

Tests must be undertaken by NATA accredited methods and as specified in **Table 4** in the ENM exemption.

An assessment for ASS/PASS is also required, refer to **Table 6** (second line item).

Sampling Requirements

Stockpiled excavated natural materials must be sampled as per the requirements in **Table 3** below. The following also applies:

- Composite sampling must be undertaken for analysis of Attributes 1 to 10 and 18 in **Table 2** above. Discrete sampling must be undertaken for analysis of Attributes 11 to 17 and 19.
- One composite sample comprises 5 sub-samples of equal size.
- Sampling must be undertaken in a manner that ensures representative materials of the whole stockpile are assessed.
- For stockpiles greater than 4000 tons, the number of samples in **Table 3** (below) must be repeated.

Table 3 Sampling Stockpiled Soils

Quantity (tons)	Number samples	Validation
<500	3	Required (test results comply with the conditions of the ENM exemption prior to the material being supplied to Site)
500-1000	4	
1000-2000	5	
2000-3000	7	
3000-4000	10	

In-situ material must be sampled by collecting discrete samples as per **Tables 4 and 5** below. For source sites larger than 50 000 m², these should be subdivided into smaller areas and sampled as per **Table 4** (below).

Table 4 In-Situ Sampling at Surface

Size of In-Situ area (m ²)	Number of Systematic sampling points	Validation
500	5	Required (test results comply with the conditions of the ENM exemption prior to the material being supplied to Site)
1000	6	
2000	7	
3000	9	
4000	11	
5000	13	
6000	15	
7000	17	
8000	19	
9000	20	
10 000	21	
15 000	25	
20 000	30	
25 000	35	
30 000	40	
35 000	45	
40 000	50	
45 000	52	
50 000	55	

Table 5 In-Situ Sampling at Depth

Sampling Requirements	Validation
1 soil sample at 1 m below ground level from each surface sampling point followed by 1 soil sample for every metre thereafter. From 1 m below ground level, sample at 1 m intervals until the proposed depth of excavation of the material is reached (refer Appendix A for further detail).	Required if the depth of excavation is equal to or greater than 1 m below ground level.

The sampling rates exclude field quality control (QC) samples. Field QC samples should be collected and analysed, including rinsates (where sampling tools have been utilised), inter and intra-laboratory duplicates and trip blanks.

2.2 VENM

The definition of VENM is provided in Section 1.3. No sampling is required for assessing if materials meet the VENM classification however, the following must be undertaken:

Table 6 VENM Assessment

Item/Consideration	VENM	Course of Action
Are manufactured chemicals or process residues present	A material can only be VENM if it has been excavated from an area that is not contaminated with manufactured chemicals or process residues as a result of industrial, commercial, mining or agricultural activities	Undertake land-use history appraisal of proposed source site. This must include at a minimum: <ul style="list-style-type: none"> Review of current and historical aerial photographs, to confirm no previous industrial land uses. Review of historical certificates of title, to assess previous owners and potential land use. Review NSW EPA website to assess if the source site and/or nearby properties have been notified under section 58 of the Contaminated Land Management Act 1997. Review the Department of Defence website for Unexploded Ordnance records. Review geological and soil maps to evaluate anticipated subsurface conditions. Inspection of the source site to ascertain current conditions, with photographic records to be provided as a line of evidence.
Are sulfidic ores or soils present	VENM cannot contain sulfidic ores or soils	<ul style="list-style-type: none"> Review acid sulfate soil risk maps Material cannot be classified as VENM if the acid sulfate soil risk maps identify a high probability of occurrence of acid sulfate soil (ASS) or potential acid sulfate soil (PASS). If the acid sulfate soil risk maps identify a high probability of ASS or PASS, chemical assessment will be required as per the Acid Sulfate Soils Assessment Guidelines and up-dated ASS laboratory method Guidelines Version 2.1 (June 2004).
Are naturally occurring asbestos soils present	VENM cannot contain naturally occurring asbestos	<ul style="list-style-type: none"> Review the applicable naturally occurring asbestos risk maps, available on WorkCover NSW website (see note below). If the maps indicate a medium/high probability of naturally occurring asbestos, sampling and analysis would be required to demonstrate that the material does not contain asbestos¹.

¹ It is recommended that these potential source sites are not considered further. If assessment and analysis is contemplated, the requirements of the ASC NEPM 2013 and Guidelines for the Assessment, Remediation and Management of Asbestos-contaminated Sites in Western Australia (May 2009) would apply.

Item/ Consideration	VENM	Course of Action
Is there any other waste present	VENM cannot contain any waste	<ul style="list-style-type: none"> Inspection of source site Interviews with personnel at source site Supplier to provide VENM certificate (refer Appendix A)
Is chemical assessment necessary	Yes, if material is potentially contaminated with manufactured chemicals or process residues and/or if ASS/PASS may be present	<ul style="list-style-type: none"> Analysis for chemicals or process residues will depend on the potential contaminant sources. If uncertainty exists, all samples should be analysed for the contaminants noted in Table 2 and TRH C6-C40, OCP, OPP, PCB and VHC (refer to Glossary for definitions) Analysis for ASS/PASS as per the relevant Guideline documents

Note: <http://www.workcover.nsw.gov.au/health-safety/safety-topics-a-z/asbestos/naturally-occurring-asbestos>

2.2.1 VENM Sampling Rates

Where required (i.e. if material is potentially contaminated with manufactured chemicals or process residues), materials being assessed as VENM should be sampled and analysed at:

- A minimum of 3 samples per source site will be required.
- Source site volumes are less than 1000 m³: 1 sample per 100 m³.
- Source site volumes greater than 1000 m³: 1 per 1000 m³. Lower rates may be applicable where site history/background data indicates a low contamination potential however, the Contractor is to provide justification for a lower sampling rate to the Superintendent prior to importing material to Site.

The sampling rates exclude field QC samples. Field QC samples should be collected and analysed, including rinsates (where sampling tools have been utilised), inter and intra-laboratory duplicates and trip blanks.

2.2.2 VENM Assessment Criteria

Where chemical testing is undertaken to assess if the material is potentially contaminated with manufactured chemicals or process residues, the results must be compared to:

- The Health Investigation Level (HIL) and Health Screening Level (HSL) presented in the ASC NEPM 2013. Exposure scenario A applicable to residential with garden accessible soil land use should be utilised.
- Analysis results for organics (i.e. TRH, BTEX, PAH, OCP, OPP, PCB and VHC) should be below the laboratory limit of reporting (LOR). Any results above LOR should be assessed on a case by case basis before allowing material on Site.
- Analysis results for metals should indicate background concentrations.

If asbestos is identified, materials will not be acceptable for use at the Site.

2.2.3 Residential Source Sites

AECOM notes that the NSW EPA stipulates that a material can only be VENM if it has been excavated from an area that is not contaminated with manufactured chemicals or process residues as a result of industrial, commercial, mining or agricultural activities. Depending on interpretation, this may or may not include residential sites subject to redevelopment.

AECOM notes that residential properties may have potential contamination sources (e.g. demolition spoil, application of pesticides beneath buildings, fuel storage, workshops/garages) or be affected by contaminants derived from off-site sources.

Residential source sites will therefore require the same level of assessment noted in **Table 6**.

Where residential redevelopment sites have been assessed to be an ENM or VENM source site and the consultant's report identifies that waste materials (i.e. overburden) will be stripped and disposed to

land fill separately, the subject site must be inspected by a Goodman representative or appointed representative. The inspection result must prove that waste material (or overburden) have been completely removed prior to importation of underlying materials to the subject Site.

2.3 Recovered Aggregates

To assess that materials meet the Recovered Aggregate classification, the requirements presented in **Appendix A** shall apply. In summary, the following are applicable.

Table 7 Recovered Aggregates, Chemicals & Concentrations

Column 1	Column 2	Column 3	Column 4
Chemicals/Attributes	Max' Average Concentration for Characterisation ⁽¹⁾	Max' Average Concentration for Routine Testing ⁽¹⁾	Absolute Maximum Concentration ⁽¹⁾
1. Mercury	0.5	Not required	1
2. Cadmium	0.5	0.5	1.5
3. Lead	75	75	150
4. Arsenic	20	Not required	40
5. Chromium (total)	60	60	120
6. Copper	60	60	150
7. Nickel	40	Not required	80
8. Zinc	200	200	350
9. Electrical conductivity	1.5 dS/m	1.5 dS/m	3 dS/m
10. Metal	1 %	1 %	2 %
11. Plaster	0.25 %	0.25 %	0.5 %
12. Rubber, plastic, paper, cloth, paint, wood and other vegetable matter	0.2 %	0.2 %	0.3 %
13. Asbestos ⁽²⁾	Not detected	Not detected	Not detected

Notes:

(1) = mg/kg 'dry weight'

(2) = added by AECOM

The absolute maximum concentration or other value of that attribute in any recovered aggregate supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 4.

2.4 Basalt Fines

To assess that materials meet the Basalt Fines classification, the requirements presented in **Appendix A** shall apply. In summary, the following are applicable.

Table 8 Basalt Fines, Chemicals & Concentrations

Column 1	Column 2	Column 3	Column 4
Chemicals/Attributes	Max' Average Concentration for Characterisation ⁽¹⁾	Max' Average Concentration for Routine Testing ⁽¹⁾	Absolute Maximum Concentration ⁽¹⁾
1. Mercury	0.5	Not required	1
2. Cadmium	0.5	0.5	1
3. Lead	50	50	100
4. Arsenic	15	15	30

Column 1	Column 2	Column 3	Column 4
5. Chromium (total)	25	Not required	50
6. Copper	25	Not required	50
7. Nickel	25	Not required	50
8. Zinc	75	75	150
9. Electrical conductivity	1 dS/m	1 dS/m	2 dS/m
10. Metal, glass, asphalt, ceramics and slag	2.5 %	Not required	5 %
11. Plaster, clay lumps and other friable materials	0.25 %	Not required	0.5 %
12. Rubber, plastic, bitumen, paper, cloth, paint, wood and other vegetable matter	0.05 %	Not required	0.1 %
13. Asbestos ⁽²⁾	Not detected	Not detected	Not detected

Notes:

(1) = mg/kg 'dry weight'

(2) = added by AECOM

The absolute maximum concentration or other value of that attribute in any recovered aggregate supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 4.

2.5 Glass Sand

To assess that materials meet the Recovered Glass Sand classification, the requirements presented in **Appendix A** shall apply. In summary, the following are applicable.

Table 9 Recovered Glass Sand, Contaminants & Concentrations

Column 1	Column 2	Column 3	Column 4
Chemicals/Attributes	Max' Average Concentration for Characterisation ⁽¹⁾	Max' Average Concentration for Routine Testing ⁽¹⁾	Absolute Maximum Concentration ⁽¹⁾
1. Mercury	0.5	Not required	1
2. Cadmium	0.5	0.5	1.5
3. Lead	50	50	100
4. Arsenic	10	Not required	20
5. Chromium (total)	20	Not required	40
6. Copper	40	Not required	120
7. Molybdenum	5	Not required	10
8. Nickel	10	Not required	20
9. Zinc	100	100	300
10. Total Organic Carbon	1 %	Not required	2 %
11. Electrical conductivity	1 dS/m	1 dS/m	2 dS/m
12. Metals	0.25 %	0.25 %	0.5 %
13. Plaster, clay lumps and other friable materials	0.25 %	0.25 %	0.5 %
14. Rubber, plastic, bitumen, paper, cloth, paint, wood and other vegetable matter	0.3 %	0.3 %	0.5 %

Column 1	Column 2	Column 3	Column 4
15. Asbestos ⁽²⁾	Not detected	Not detected	Not detected

Notes:

(1) = mg/kg 'dry weight'

(2) = added by AECOM

The absolute maximum concentration or other value of that attribute in any recovered aggregate supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 4.

2.6 Consultants' Assessment Reports

A report will be required for each potential VENM or ENM source site. Each report must be prepared by an appropriately qualified consultant and include:

- All applicable ENM and/or VENM assessment requirements noted in this document.
- Identifiers for the source site (i.e. street address and suburb and Lot and Deposited Plan numbers).
- A Figure showing the location of the source site.
- The anticipated volume of material to be imported to the subject site.
- A description of the material to be imported to the subject site.
- Site inspection observations, including neighbouring properties.
- Photographs showing site conditions.
- Copies of NATA stamped laboratory analysis certificates, including chain of custody documentation, sample receipt acknowledgement forms, quality assurance/quality control (QA/QC) data.
- Analysis results for field QA/QC samples (e.g. equipment rinsate blanks, field duplicates etc). AECOM recommends that split field duplicate samples are analysed by a secondary laboratory, so that an assessment of the precision of the primary laboratory data can be made. QA/QC evaluation should be undertaken with reference to the ASC NEPM 2013.
- Evaluation of the analysis data reliability and useability.
- A conclusion (i.e. does the material meet the classification of either ENM or VENM).

2.7 Review of Consultants Assessment Reports

Goodman or Goodmans' appointed representative(s) should be provided a copy of each Assessment Report for review purposes. An appropriate report, addressing all items in Section 2.6, must be sighted prior to the importation of material to the Site.

In the event that the review indicates insufficient assessment data, no materials shall be imported to the Site until the Consultant has satisfactorily addressed the identified data gaps.

Goodman or Goodmans' appointed representative(s) should retain a copy of each Assessment Report. This includes source sites not deemed to be an acceptable source of ENM or VENM or reports lacking sufficient data, so that an "Exclusion Register" can be maintained and tracked.

2.8 POEO (Waste) Regulation 2014 Documentation

For any materials imported to Site under the applicable Resource Recovery Order (RRO), the following shall apply:

- The commercial supplier of the material must provide a letter stating that the material was generated under the applicable RRO. At least one letter per material type will be required.
- The commercial supplier must provide copies of test results, confirming contaminant concentrations meet the applicable 'Absolute maximum concentrations'.

Should either of these conditions not be met, the Goodman appointed Principal Contractor must ensure that testing and analysis is undertaken to ensure suitability of the materials for use at the Site.

2.9 On-Site Inspections

During importation of materials, the Earthworks Contractor will undertake inspections of vehicles entering the Site. The following information should be noted and recorded:

- Vehicle registration (license plate) number.
- Location of source site.
- Contact name at source site.
- Time left source site and time of arrival at Site.
- Contents of truck and are they similar to the expected contents.
- Inspection of materials when deposited from truck.
- GPS truck-tracking data (if applicable).

Where suspicious loads and/or evasive answers and/or incomplete vehicle tracking data are apparent, permission to unload should not be granted.

Where contaminants or suspected contaminants are observed in imported material during tipping, the truck will be reloaded and be sent back to the source site. Cartage from the source site shall cease and will only recommence when the Earthworks Contractor is satisfied that the issue has been addressed.

3.0 Materials Tracking Register

A Materials Tracking Register (MTR) must be implemented by the Earthworks Contractor, to ensure that only 'approved' material is imported to the Site. At a minimum, the MTR should include the following:

- Location of source site, expected volume of material and description and reference to a Consultant's Assessment Report.
- Log of vehicles leaving source site, to be provided by the source site each morning, including license plate details. The source site should also provide an indication of the number of truck loads expected each day.
- All trucks arriving at Site must possess a loading docket from the source site. If a truck does not possess a loading docket, it will not be allowed to unload at the Site. The loading docket must identify the source site and time the truck left the source site.
- A Spotter (or Spotters) will be at Site, to meet all trucks. The Spotter(s) will:
 - Log all vehicles entering the Site, including license plate details and 'time in'.
 - Check the loading docket, including time left source site and time-in at Site. Any discrepancies in times will be discussed. Trucks with significant time discrepancies may be refused entry to the Site.
 - Description of materials imported (e.g. clay, shale, sandstone etc.).
 - Location materials deposited at Site.
 - When tipping, the Spotter will check material for unexpected contaminants (odours, staining, waste materials etc.).

When the Spotter(s) is/are satisfied, they will sign the loading docket and keep a copy for records. All records will be retained by the contractor and are to be available to the Department of Planning upon request

An example pro-forma is included in **Appendix B**.

Appendix A

POEO (Waste)
Regulation, Orders &
Exemptions



Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The excavated natural material order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of excavated natural material to which 'the excavated natural material exemption 2014' applies. The requirements in this order apply in relation to the supply of excavated natural material for application to land as engineering fill or for use in earthworks.

1. Waste to which this order applies

- 1.1. This order applies to excavated natural material. In this order, excavated natural material means naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:
- a) been excavated from the ground, and
 - b) contains at least 98% (by weight) natural material, and
 - c) does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

2. Persons to whom this order applies

- 2.1. The requirements in this order apply, as relevant, to any person who supplies excavated natural material, that has been generated, processed or recovered by the person.
- 2.2. This order does not apply to the supply of excavated natural material to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

- 3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Generator requirements

The EPA imposes the following requirements on any generator who supplies excavated natural material.

Sampling requirements

- 4.1. On or before supplying excavated natural material, the generator must:
 - 4.1.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for the excavated natural material.
 - 4.1.2. Undertake sampling and testing of the excavated natural material as required under clauses 4.2, 4.3, and 4.4 below. The sampling must be carried out in accordance with the written sampling plan.
- 4.2. The generator must undertake sampling and analysis of the material for ASS and PASS, in accordance with the NSW Acid Sulfate Soil Manual, Acid Sulfate Soils Management Advisory Council, 1998 and the updated Laboratory Methods Guidelines version 2.1 – June 2004 where:
 - 4.2.1. the pH measured in the material is below 5, and/or
 - 4.2.2. the review of the applicable Acid Sulfate Soil Risk Maps (published by the former Department of Land and Water Conservation and available at <http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm>) indicates the potential presence of ASS.
- 4.3. For stockpiled material, the generator must:
 - 4.3.1. undertake sampling in accordance with Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent);
 - 4.3.2. undertake characterisation sampling by collecting the number of samples listed in Column 2 of Table 1 with respect to the quantity of the waste listed in Column 1 of Table 1 and testing each sample for the chemicals and other attributes listed in Column 1 of Table 4. For the purposes of characterisation sampling the generator must collect:
 - 4.3.2.1. composite samples for attributes 1 to 10 and 18 in Column 1 of Table 4.
 - 4.3.2.2. discrete samples for attributes 11 to 17 in Column 1 of Table 4.
 - 4.3.2.3. The generator must carry out sampling in a way that ensures that the samples taken are representative of the material from the entire stockpile. All parts of the stockpile must be equally accessible for sampling.
 - 4.3.2.4. for stockpiles greater than 4,000 tonnes the number of samples described in Table 1 must be repeated.
 - 4.3.3. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 1

Sampling of Stockpiled Material		
Column 1	Column 2	Column 3
Quantity (tonnes)	Number of samples	Validation
<500	3	Required
500 – 1,000	4	
1,000 – 2,000	5	
2,000 – 3,000	7	
3,000 – 4,000	10	

4.4. For in situ material, the generator must:

- 4.4.1. undertake sampling by collecting discrete samples. Compositing of samples is not permitted for in-situ materials.
- 4.4.2. undertake characterisation sampling for the range of chemicals and other attributes listed in Column 1 of Table 4 according to the requirements listed in Columns 1, 2 and 3 of Table 2. When the ground surface is not comprised of soil (e.g. concrete slab), samples must be taken at the depth at which the soil commences.
- 4.4.3. undertake sampling at depth according to Column 1 of Table 3.
- 4.4.4. collect additional soil samples (and analyse them for the range of chemicals and other attributes listed in Column 1 of Table 4), at any depth exhibiting discolouration, staining, odour or other indicators of contamination inconsistent with soil samples collected at the depth intervals indicated in Table 3.
- 4.4.5. segregate and exclude hotspots identified in accordance with Table 2, from material excavated for reuse.
- 4.4.6. subdivide sites larger than 50,000 m² into smaller areas and sample each area as per Table 2.
- 4.4.7. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 2

<i>In Situ Sampling at surface</i>				
Column 1	Column 2	Column 3	Column 4	Column 5
Size of <i>in situ</i> area (m ²)	Number of systematic sampling points recommended	Distance between two sampling points (m)	Diameter of the hot spot that can be detected with 95% confidence (m)	Validation
500	5	10.0	11.8	Required
1000	6	12.9	15.2	
2000	7	16.9	19.9	
3000	9	18.2	21.5	
4000	11	19.1	22.5	
5000	13	19.6	23.1	
6000	15	20.0	23.6	
7000	17	20.3	23.9	
8000	19	20.5	24.2	
9000	20	21.2	25.0	
10,000	21	21.8	25.7	
15,000	25	25.0	28.9	
20,000	30	25.8	30.5	
25,000	35	26.7	31.5	
30,000	40	27.5	32.4	
35,000	45	27.9	32.9	
40,000	50	28.3	33.4	
45,000	52	29.3	34.6	
50,000	55	30.2	35.6	

Table 2 has been taken from NSW EPA 1995, *Contaminated Sites Sampling Design Guidelines*, NSW Environment Protection Authority.

Table 3

<i>In Situ Sampling at Depth</i>	
Column 1	Column 2
Sampling Requirements *	Validation
<p>1 soil sample at 1.0 m bgl from each surface sampling point followed by 1 soil sample for every metre thereafter.</p> <p>From 1.0 m bgl, sample at the next metre interval until the proposed depth of excavation of the material is reached. If the proposed depth of excavation is between 0.5 to 0.9 m after the last metre interval, sample at the base of the proposed depth of excavation.</p>	Required if the depth of excavation is equal to or greater than 1.0 m bgl

* Refer to Notes for examples

Chemical and other material requirements

- 4.5. The generator must not supply excavated natural material waste to any person if, in relation to any of the chemical and other attributes of the excavated natural material:
- 4.5.1. The chemical concentration or other attribute of any sample collected and tested as part of the characterisation of the excavated natural material exceeds the absolute maximum concentration or other value listed in Column 3 of Table 4:
 - 4.5.2. The average concentration or other value of that attribute from the characterisation of the excavated natural material (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 4.
- 4.6. The absolute maximum concentration or other value of that attribute in any excavated natural material supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 4

Column 1	Column 2	Column 3
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	1
2. Cadmium	0.5	1
3. Lead	50	100
4. Arsenic	20	40
5. Chromium (total)	75	150
6. Copper	100	200
7. Nickel	30	60
8. Zinc	150	300
9. Electrical Conductivity	1.5 dS/m	3 dS/m
10. pH *	5 to 9	4.5 to 10
11. Total Polycyclic Aromatic Hydrocarbons (PAHs)	20	40
12. Benzo(a)pyrene	0.5	1
13. Benzene	NA	0.5
14. Toluene	NA	65
15. Ethyl-benzene	NA	25
16. Xylene	NA	15
17. Total Petroleum Hydrocarbons C ₁₀ -C ₃₆	250	500
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.10%

* The ranges given for pH are for the minimum and maximum acceptable pH values in the excavated natural material.

Test methods

- 4.7. The generator must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.
- 4.8. The generator must ensure that the chemicals and other attributes (listed in Column 1 of Table 4) in the excavated natural material it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.
 - 4.8.1. Test methods for measuring the mercury concentration.
 - 4.8.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated absolute maximum concentration in Column 3 of Table 2 (i.e. < 0.20 mg/kg dry weight).
 - 4.8.1.2. Report as mg/kg dry weight.
 - 4.8.2. Test methods for measuring chemicals 2 to 8.
 - 4.8.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils (or an equivalent analytical method).
 - 4.8.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of the stated absolute maximum concentration in Column 3 of Table 2, (e.g. 10 mg/kg dry weight for lead).
 - 4.8.2.3. Report as mg/kg dry weight.
 - 4.8.3. Test methods for measuring electrical conductivity and pH.
 - 4.8.3.1. Sample preparation by mixing 1 part excavated natural material with 5 parts distilled water.
 - 4.8.3.2. Analysis using Method 103 (pH) and 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 4.8.3.3. Report electrical conductivity in deciSiemens per metre (dS/m).
 - 4.8.4. Test method for measuring Polynuclear Aromatic Hydrocarbons (PAHs) and benzo(a)pyrene.
 - 4.8.4.1. Analysis using USEPA SW-846 Method 8100 Polynuclear Aromatic Hydrocarbons (or an equivalent analytical method).
 - 4.8.4.2. Calculate the sum of all 16 PAHs for total PAHs.
 - 4.8.4.3. Report total PAHs as mg/kg dry weight.
 - 4.8.4.4. Report benzo(a)pyrene as mg/kg.

- 4.8.5. Test method for measuring benzene, toluene, ethylbenzene and xylenes (BTEX).
- 4.8.5.1. Method 501 (Volatile Alkanes and Monocyclic Aromatic Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
- 4.8.5.2. Report BTEX as mg/kg.
- 4.8.6. Test method for measuring Total Petroleum Hydrocarbons (TPH).
- 4.8.6.1. Method 506 (Petroleum Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
- 4.8.6.2. Report as mg/kg dry weight.
- 4.8.7. Test method for measuring rubber, plastic, bitumen, paper, cloth, paint and wood.
- 4.8.7.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Concrete (or an equivalent method).
- 4.8.7.2. Report as percent.

Notification

- 4.9. On or before each transaction, the generator must provide the following to each person to whom the generator supplies the excavated natural material:
- a written statement of compliance certifying that all the requirements set out in this order have been met;
 - a copy of the excavated natural material exemption, or a link to the EPA website where the excavated natural material exemption can be found; and
 - a copy of the excavated natural material order, or a link to the EPA website where the excavated natural material order can be found.

Record keeping and reporting

- 4.10. The generator must keep a written record of the following for a period of six years:
- the sampling plan required to be prepared under clause 4.1.1;
 - all characterisation sampling results in relation to the excavated natural material supplied;
 - the volume of detected hotspot material and the location;
 - the quantity of the excavated natural material supplied; and
 - the name and address of each person to whom the generator supplied the excavated natural material.
- 4.11. The generator must provide, on request, the characterisation and sampling results for that excavated natural material supplied to the consumer of the excavated natural material.

5. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

Bgl means below ground level, referring to soil at depth beneath the ground surface.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply excavated natural material to land.

discrete sample means a sample collected and analysed individually that will not be composited.

generator means a person who generates excavated natural material for supply to a consumer.

hotspot means a cylindrical volume which extends through the soil profile from the ground surface to the proposed depth of excavation, where the level of any contaminant listed in Column 1 of Table 2 is greater than the absolute maximum concentration in Column 3 of Table 2.

in situ material means material that exists on or below the ground level. It does not include stockpiled material.

in situ sampling means sampling undertaken on *in situ* material.

N/A means not applicable.

stockpiled material means material that has been excavated from the ground and temporarily stored on the ground prior to use.

systematic sampling means sampling at points that are selected at even intervals and are statistically unbiased.

transaction means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of excavated natural material that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of excavated natural material, the first supply of excavated natural material as required under the arrangement.

Manager Waste Strategy and Innovation
Environment Protection Authority
(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on ' www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies excavated natural material should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of excavated natural material remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.

Examples

In situ sampling at depth

Example 1.

If the proposed depth of ENM excavation is between 1 m bgl and 1.4 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- No further depth sampling after 1 m bgl, unless required under section 4.4.4.

Example 2.

If the proposed depth of ENM excavation is at 1.75 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 1.75 m bgl.
- No further depth sampling after 1.75 m bgl, unless required under section 4.4.4.

Example 3.

If the proposed depth of ENM excavation is at 2.25 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 2 m bgl.
- No further depth sampling after 2 m bgl, unless required under section 4.4.4.



Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014

The excavated natural material exemption 2014

Introduction

This exemption:

- is issued by the Environment Protection Authority (EPA) under clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation); and
- exempts a consumer of excavated natural material from certain requirements under the *Protection of the Environment Operations Act 1997* (POEO Act) and the Waste Regulation in relation to the application of that waste to land, provided the consumer complies with the conditions of this exemption.

This exemption should be read in conjunction with 'the excavated natural material order 2014'.

1. Waste to which this exemption applies

- 1.1. This exemption applies to excavated natural material that is, or is intended to be, applied to land as engineering fill or for use in earthworks.
- 1.2. Excavated natural material is naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:
 - a) been excavated from the ground, and
 - b) contains at least 98% (by weight) natural material, and
 - c) does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

2. Persons to whom this exemption applies

- 2.1. This exemption applies to any person who applies or intends to apply excavated natural material to land as set out in 1.1.

3. Duration

- 3.1. This exemption commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Premises to which this exemption applies

- 4.1. This exemption applies to the premises at which the consumer's actual or intended application of excavated natural material is carried out.

5. Revocation

- 5.1. 'The excavated natural material exemption 2012' which commenced 19 October 2012 is revoked from 24 November 2014.

6. Exemption

- 6.1. Subject to the conditions of this exemption, the EPA exempts each consumer from the following provisions of the POEO Act and the Waste Regulation in relation to the consumer's actual or intended application of excavated natural material to land as engineering fill or for use in earthworks at the premises:
- section 48 of the POEO Act in respect of the scheduled activities described in clauses 39 of Schedule 1 of the POEO Act;
 - Part 4 of the Waste Regulation;
 - section 88 of the POEO Act; and
 - clause 109 and 110 of the Waste Regulation.
- 6.2. The exemption does not apply in circumstances where excavated natural material is received at the premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal' (thermal treatment) of Schedule 1 of the POEO Act.

7. Conditions of exemption

The exemption is subject to the following conditions:

- 7.1. At the time the excavated natural material is received at the premises, the material must meet all chemical and other material requirements for excavated natural material which are required on or before the supply of excavated natural material under 'the excavated natural material order 2014'.
- 7.2. The excavated natural material can only be applied to land as engineering fill or for use in earthworks.
- 7.3. The consumer must keep a written record of the following for a period of six years:
- the quantity of any excavated natural material received; and
 - the name and address of the supplier of the excavated natural material received.
- 7.4. The consumer must make any records required to be kept under this exemption available to authorised officers of the EPA on request.
- 7.5. The consumer must ensure that any application of excavated natural material to land must occur within a reasonable period of time after its receipt.

8. Definitions

In this exemption:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

consumer means a person who applies, or intends to apply excavated natural material to land.

**Manager Waste Strategy and Innovation
Environment Protection Authority
(by delegation)**

Notes

The EPA may amend or revoke this exemption at any time. It is the responsibility of the consumer to ensure they comply with all relevant requirements of the most current exemption. The current version of this exemption will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this exemption, the EPA is not in any way endorsing the use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this exemption are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this exemption nor the accompanying order guarantee that the environment, human health or agriculture will not be harmed.

The consumer should assess whether or not the excavated natural material is fit for the purpose the material is proposed to be used for, and whether this use will cause harm. The consumer may need to seek expert engineering or technical advice.

Regardless of any exemption provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The receipt of excavated natural material remains subject to other relevant environmental regulations in the POEO Act and the Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of having an exemption, is guilty of an offence and subject to prosecution.

This exemption does not alter the requirements of any other relevant legislation that must be met in utilising this material, including for example, the need to prepare a Safety Data Sheet (SDS).

Failure to comply with the conditions of this exemption constitutes an offence under clause 91 of the Waste Regulation.

Certification: Virgin excavated natural material



1. I [full name]

of [organisation
and address]

certify that the waste as set out in section 2 of this notice is Virgin Excavated Natural Material (VENM) as defined in Schedule 1 of the *Protection of the Environment Operations Act 1997*.

This certification is made on behalf of the waste generator [fill out if applicable]

being [full name]

of [organisation
and address]

2. The waste was generated at:

Street address:

Title reference (Lot/DP, etc.):

The amount of waste
(by volume or weight) is:

3. I have made the determination that the waste is VENM because:

- ☐ I have assessed the historical and current land use of the site at which the waste was generated.
- ☐ The waste is not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities.
- ☐ The waste does not contain any sulfidic ores or soils.
- ☐ The waste does not contain any other waste.
- ☐ The waste does not contain asbestos in any form.

Note: that all sections of this form must be completed including all boxes checked in Section 3 above and signed below for any material to be certified as VENM.

Signature(s)

.....

Name(s) (printed)

Date

Warning: There are significant penalties under s.144AA of the *Protection of the Environment Operations Act 1997* for a person who supplies (whether knowingly or not) information that is false or misleading in a material respect about waste.

This certificate is intended to assist waste generators, contractors and/or receivers of VENM to have confidence that a range of relevant factors have been considered in the classification of a waste material as VENM.

Published by:

Environment Protection Authority, 59–61 Goulburn Street, Sydney South 1232

Ph: 131 555. TTY users: phone 133 677, then ask for 131 555

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Email: info@environment.nsw.gov.au; Web: www.epa.nsw.gov.au

Report pollution and environmental incidents: Environment Line: 131 555 (NSW only)

EPA 2013/0693; September 2013



Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The recovered aggregate order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of recovered aggregate to which 'the recovered aggregate exemption 2014' applies. The requirements in this order apply in relation to the supply of recovered aggregate for application to land as a road making material, or in building, landscaping or construction works.

1. Waste to which this order applies

- 1.1. This order applies to recovered aggregate. In this order, recovered aggregate means material comprising of concrete, brick, ceramics, natural rock and asphalt processed into an engineered material. This does not include refractory bricks or associated refractory materials, or asphalt that contains coal tar.

2. Persons to whom this order applies

- 2.1. The requirements in this order apply, as relevant, to any person who supplies recovered aggregate that has been generated, processed or recovered by the person.
- 2.2. This order does not apply to the supply of recovered aggregate to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

- 3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Processor requirements

The EPA imposes the following requirements on any processor who supplies recovered aggregate.

Sampling requirements

- 4.1. On or before supplying recovered aggregate, the processor must:
 - 4.1.1. Prepare a written sampling plan which includes a description of sample

preparation and storage procedures for the recovered aggregate.

- 4.1.2. Undertake sampling and testing of the recovered aggregate as required under clauses 4.2 and 4.3 below. The sampling must be carried out in accordance with the written sampling plan and Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent).
- 4.2. Where the recovered aggregate is generated as part of a continuous process, the processor must undertake the following sampling:
 - 4.2.1. Characterisation of the recovered aggregate by collecting 20 composite samples of the waste and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of characterisation. Characterisation must be conducted for recovered aggregate generated and processed every year following the commencement of the continuous process; and
 - 4.2.2. Routine sampling of the recovered aggregate by collecting either 5 composite samples from every 4,000 tonnes (or part thereof) processed or 5 composite samples every 3 months (whichever is the lesser); and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1 other than those listed as 'not required' in Column 3. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of routine sampling. However, if characterisation sampling occurs at the same frequency as routine sampling, any sample collected and tested for the purposes of characterisation under clause 4.2.1 may be treated as a sample collected and tested for the purposes of routine sampling under clause 4.2.2.
- 4.3. Where the recovered aggregate is not generated as part of a continuous process, the processor must undertake one-off sampling of a batch, truckload or stockpile of the recovered aggregate, by collecting 10 composite samples from every 4,000 tonnes (or part thereof) processed and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1. The test results for each composite sample must be validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 1 and the absolute maximum concentration or other value listed in Column 4 of Table 1 prior to the supply of the recovered aggregate.

Chemical and other material requirements

- 4.4. The processor must not supply recovered aggregate to any person if, in relation to any of the chemical and other attributes of the recovered aggregate:
 - 4.4.1. The concentration or other value of that attribute of any sample collected and tested as part of the characterisation, or the routine or one-off sampling, of the recovered aggregate exceeds the absolute maximum concentration or other value listed in Column 4 of Table 1, or
 - 4.4.2. The average concentration or other value of that attribute from the characterisation or one-off sampling of the recovered aggregate (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 1, or
 - 4.4.3. The average concentration or other value of that attribute from the routine sampling of the recovered aggregate (based on the arithmetic mean) exceeds the maximum average concentration or other value

listed in Column 3 of Table 1.

- 4.5. The absolute maximum concentration or other value of that attribute in any recovered aggregate supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 4 of Table 1.

Table 1

Column 1	Column 2	Column 3	Column 4
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Maximum average concentration for routine testing (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	Not required	1
2. Cadmium	0.5	0.5	1.5
3. Lead	75	75	150
4. Arsenic	20	Not required	40
5. Chromium (total)	60	60	120
6. Copper	60	60	150
7. Nickel	40	Not required	80
8. Zinc	200	200	350
9. Electrical Conductivity	1.5 dS/m	1.5dS/m	3 dS/m
10. Metal	1%	1%	2%
11. Plaster	0.25%	0.25%	0.5%
12. Rubber, plastic, paper, cloth, paint, wood and other vegetable matter	0.2%	0.2%	0.3%

Test methods

- 4.6. The processor must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.
- 4.7. The processor must ensure that the chemicals and other attributes (listed in Column 1 of Table 1) in the recovered aggregate it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.
- 4.7.1. Test method for measuring the mercury concentration:
- 4.7.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated maximum average concentration in Table 1, Column 2 (i.e. < 0.1 mg/kg dry weight).
- 4.7.1.2. Report as mg/kg dry weight.
- 4.7.2. Test methods for measuring chemicals 2 - 8:

- 4.7.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils.
- 4.7.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of stated maximum concentration in Table 1, Column 2 (i.e. 1 mg/kg dry weight for lead).
- 4.7.2.3. Report as mg/kg dry weight.
- 4.7.3. Test methods for measuring the electrical conductivity:
 - 4.7.3.1. Sample preparation by mixing 1 part recovered aggregate with 5 parts distilled water.
 - 4.7.3.2. Analysis using Method 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 4.7.3.3. Report deciSiemens per metre (dS/m).
- 4.7.4. Test method for measuring the attributes 10 - 12:
 - 4.7.4.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Aggregate (or an equivalent method), for the materials listed in 10 - 12 of Column 1, Table 1.
 - 4.7.4.2. Report as %

Notification

- 4.8. On or before each transaction, the processor must provide the following to each person to whom the processor supplies the recovered aggregate:
 - a written statement of compliance certifying that all the requirements set out in this order have been met;
 - a copy of the recovered aggregate exemption, or a link to the EPA website where the recovered aggregate exemption can be found; and
 - a copy of the recovered aggregate order, or a link to the EPA website where the recovered aggregate order can be found.

Record keeping and reporting

- 4.9. The processor must keep a written record of the following for a period of six years:
 - the sampling plan required to be prepared under clause 4.1.1;
 - all characterisation, routine and/or one-off sampling results in relation to the recovered aggregate supplied;
 - the quantity of the recovered aggregate supplied; and
 - the name and address of each person to whom the processor supplied the recovered aggregate.
- 4.10. The processor must provide, on request, the most recent characterisation and sampling (whether routine or one-off or both) results for recovered aggregate supplied to any consumer of the recovered aggregate.
- 4.11. The processor must notify the EPA within seven days of becoming aware that it has not complied with any requirement in clause 4.1 to 4.7.

5. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply, recovered aggregate to land.

continuous process means a process that produces recovered aggregate on an ongoing basis.

processor means a person who processes, mixes, blends, or otherwise incorporates recovered aggregate into a material in its final form for supply to a consumer.

transaction means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of recovered aggregate that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of recovered aggregate the first supply of recovered aggregate as required under the arrangement.

Manager Waste Strategy and Innovation

Environment Protection Authority

(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies recovered aggregate should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of recovered aggregate remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.



Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The basalt fines order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of basalt fines to which 'the basalt fines exemption 2014' applies. The requirements in this order apply in relation to the supply of basalt fines for application to land for building or maintaining railway infrastructure, for road making activities, or as a soil amendment.

1. Waste to which this order applies

- 1.1. This order applies to basalt fines. In this order, basalt fines means a material comprising of naturally excavated basalt with a maximum particle size of 9.5 mm, that is derived from the processing of basalt or the recycling of railway ballast.

2. Persons to whom this order applies

- 2.1. The requirements in this order apply, as relevant, to any person who supplies basalt fines that has been generated, processed or recovered by the person.
- 2.2. This order does not apply to the supply of basalt fines to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

- 3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Processor requirements

The EPA imposes the following requirements on any processor who supplies basalt fines.

Sampling requirements

- 4.1. On or before supplying basalt fines the processor must:
 - 4.1.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for the basalt fines.
 - 4.1.2 Undertake sampling and testing of the basalt fines as required under

clauses 4.2 and 4.3 below. The sampling must be carried out in accordance with the written sampling plan and Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent).

- 4.2. Where the basalt fines are generated as part of a continuous process, the processor must undertake the following sampling:
 - 4.2.1. Characterisation of the basalt fines by collecting 20 composite samples of the waste and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of characterisation. Characterisation must be conducted for basalt fines generated and processed during each 2-year period following the commencement of the continuous process; and
 - 4.2.2. Routine sampling of basalt fines by collecting either 5 composite samples from every 10,000 tonnes (or part thereof) processed or 5 composite samples every 3 months (whichever is the lesser); and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1 other than those listed as 'not required' in Column 3. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of routine sampling. However, if characterisation sampling occurs at the same frequency as routine sampling, any sample collected and tested for the purposes of characterisation under clause 4.2.1 may be treated as a sample collected and tested for the purposes of routine sampling under clause 4.2.2.
- 4.3. Where the basalt fines are not generated as part of a continuous process, the processor must undertake one-off sampling of a batch, truckload or stockpile of the basalt fines, by collecting 10 composite samples from every 4,000 tonnes (or part thereof) processed and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1. The test results for each composite sample must be validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 1 and the absolute maximum concentration or other value listed in Column 4 of Table 1 prior to the supply of the basalt fines.

Chemical and other material requirements

- 4.4. The processor must not supply basalt fines to any person if, in relation to any of the chemical and other attributes of the basalt fines:
 - 4.4.1. The concentration or other value of that attribute of any sample collected and tested as part of the characterisation or the routine or one-off sampling of the basalt fines exceeds the absolute maximum concentration or other value listed in Column 4 of Table 1, or
 - 4.4.2. The average concentration or other value of that attribute from the characterisation or one-off sampling of the basalt fines (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 1, or
 - 4.4.3. The average concentration or other value of that attribute from the routine sampling of the basalt fines (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 3 of Table 1.

- 4.5. The absolute maximum concentration or other value of that attribute in any basalt fines supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 4 of Table 1.

Table 1

Column 1	Column 2	Column 3	Column 4
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Maximum average concentration for routine testing (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	Not required	1
2. Cadmium	0.5	0.5	1
3. Lead	50	50	100
4. Arsenic	15	15	30
5. Chromium (total)	25	Not required	50
6. Copper	25	Not required	50
7. Nickel	25	Not required	50
8. Zinc	75	75	150
9. Electrical Conductivity	1 dS/m	1 dS/m	2 dS/m
10. Metal, glass, asphalt, ceramics and slag	2.5%	Not required	5%
11. Plaster, clay lumps and other friable materials	0.25%	Not required	0.5%
12. Rubber, plastic, bitumen, paper, cloth, paint, wood and other vegetable matter	0.05%	Not required	0.1%

Test methods

- 4.6. The processor must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.
- 4.7. The processor must ensure that the chemicals and other attributes (listed in Column 1 of Table 1) in the basalt fines it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.
- 4.6.1 Test methods for measuring the mercury concentration:
- 4.6.1.1 Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated absolute maximum average concentration in Table 1, Column 4 (i.e. <0.2mg/kg dry weight of mercury).
- 4.6.1.2 Report as mg/kg dry weight.

- 4.6.2 Test methods for measuring chemicals 2 - 8:
 - 4.6.2.1 Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils.
 - 4.6.2.2 Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of the stated absolute maximum concentration in Table 1, Column 4 (i.e. <10 mg/kg dry weight for lead).
 - 4.6.2.3 Report as mg/kg dry weight.
- 4.6.3 Test methods for measuring the electrical conductivity:
 - 4.6.3.1 Sample preparation by mixing 1 part basalt fines with 5 parts distilled water.
 - 4.6.3.2 Analysis using Method 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 4.6.3.3 Report in deciSiemens per metre (dS/m).
- 4.6.4 Test method for measuring the attributes 10 - 12:
 - 4.6.4.1 NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Concrete (or an equivalent method) and modified to use a 2.36mm sieve.
 - 4.6.4.2 Report as %.

Notification

- 4.8. On or before each transaction, the processor must provide the following to each person to whom the processor supplies the basalt fines:
 - a written statement of compliance certifying that all the requirements set out in this order have been met;
 - a copy of the basalt fines exemption, or a link to the EPA website where the basalt fines exemption can be found; and
 - a copy of the basalt fines order, or a link to the EPA website where the basalt fines order can be found.

Record keeping and reporting

- 4.9. The processor must keep a written record of the following for a period of six years:
 - the sampling plan required to be prepared under clause 4.1.1;
 - all characterisation, routine and/or one-off sampling results in relation to the basalt fines supplied;
 - the quantity of the basalt fines supplied; and
 - the name and address of each person to whom the processor supplied the basalt fines.
- 4.10. The processor must provide, on request, the most recent characterisation and sampling (whether routine or one-off or both) results for basalt fines supplied to any consumer of the basalt fines.
- 4.11. The processor must notify the EPA within seven days of becoming aware that it has not complied with any requirement in clause 4.1 to 4.7.

5. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply, basalt fines to land.

continuous process means a process that produces basalt fines on an ongoing basis.

processor means a person who processes, mixes, blends, or otherwise incorporates basalt fines into a material in its final form for supply to a consumer.

transaction means:

- in the case of a one-off supply, the supply of basalt fines, the supply of a batch, truckload or stockpile of basalt fine that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of basalt fines, the first supply of basalt fines as required under the arrangement.

Manager Waste Strategy and Innovation

Environment Protection Authority

(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor and to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies basalt fines should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of basalt fines remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.



Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The recovered glass sand order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of recovered glass sand to which 'the recovered glass sand exemption 2014' applies. The requirements in this order apply in relation to the supply of recovered glass sand for application to land for the purpose of pipe bedding, drainage or for road making activities.

1. Waste to which this order applies

- 1.1. This order applies to recovered glass sand. In this order, recovered glass sand means recovered glass that has been processed to produce a 'sand-like' glass material with a particle size diameter generally less than 5 mm, and that contains at least 98% recovered glass.

2. Persons to whom this order applies

- 2.1. The requirements in this order apply, as relevant, to any person who supplies recovered glass sand that has been generated, processed or recovered by the person.
- 2.2. This order does not apply to the supply of recovered glass sand to a consumer for land application at the premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal' (thermal treatment) of Schedule 1 of the POEO Act.

3. Duration

- 3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Processor requirements

The EPA imposes the following requirements on any processor who supplies recovered glass sand.

Sampling requirements

- 4.1. On or before supplying recovered glass sand the processor must:
 - 4.1.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for the recovered glass sand.
 - 4.1.2. Undertake sampling and testing of the recovered glass sand as required under clauses 4.2 and 4.3 below. The sampling must be carried out in accordance with Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent).
- 4.2. Where the recovered glass sand is generated as part of a continuous process, the processor must undertake the following sampling:
 - 4.2.1. Characterisation sampling of recovered glass sand by collecting 20 composite samples of the waste and testing each sample for the chemical and other attributes listed in Column 1 of Table 1. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of characterisation. Where there is a change in inputs that is likely to affect the properties of the recovered glass sand, characterisation must be repeated. Characterisation samples can be used for routine testing and subsequent calculations. Characterisation must be conducted for recovered glass sand generated and processed during each 2-year period following the commencement of the continuous process; and
 - 4.2.2. Routine sampling of the recovered glass sand by collecting either 5 composite samples from every 4,000 tonnes (or part thereof) processed or 5 composite samples every 3 months (whichever is the lesser); and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1 other than those listed as 'not required' in Column 3. Each composite sample must be taken from a batch, truckload or stockpile that has not been previously sampled for the purposes of routine sampling. However, if characterisation sampling occurs at the same frequency as routine sampling, any sample collected and tested for the purposes of characterisation under clause 4.2.1 may be treated as a sample collected and tested for the purposes of routine sampling under clause 4.2.2.
- 4.3. Where the recovered glass sand is not generated as part of a continuous process, the processor must undertake one-off sampling of a batch, truckload or stockpile of the recovered glass sand, by collecting 10 composite samples from every 4,000 tonnes (or part thereof) processed and testing each sample for the chemicals and other attributes listed in Column 1 of Table 1. The test results for each composite sample must be validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 1 and the absolute maximum concentration or other value listed in Column 4 of Table 1 prior to the supply of the recovered glass sand.

Chemical and other material requirements

- 4.4. The processor must not supply recovered glass sand to any person if, in relation to any of the chemical and other attributes of the recovered glass sand:

- 4.4.1. The concentration or other value of that attribute of any sample collected and tested as part of the characterisation, or the routine or one-off sampling, of the recovered glass sand exceeds the absolute maximum concentration or other value listed in Column 4 of Table 1, or
- 4.4.2. The average concentration or other value of that attribute from the characterisation or one-off sampling of the recovered glass sand (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 1, or
- 4.4.3. The average concentration or other value of that attribute from the routine sampling of the recovered glass sand (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 3 of Table 1.
- 4.5. The absolute maximum concentration or other value of that attribute in any recovered glass sand supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 4 of Table 1.

Table 1

Column 1	Column 2	Column 3	Column 4
Chemicals and other attributes	Maximum average concentration for characterisation (mg/kg 'dry weight' unless otherwise specified)	Maximum average concentration for routine testing (mg/kg 'dry weight' unless otherwise specified)	Absolute maximum concentration (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	Not required	1
2. Cadmium	0.5	0.5	1.5
3. Lead	50	50	100
4. Arsenic	10	Not required	20
5. Chromium (total)	20	Not required	40
6. Copper	40	Not required	120
7. Molybdenum	5	Not required	10
8. Nickel	10	Not required	20
9. Zinc	100	100	300
10. Total Organic Carbon	1.0%	Not required	2.0%
11. Electrical Conductivity	1 dS/m	1 dS/m	2 dS/m
12. Metals	0.25%	0.25%	0.50%
13. Plaster, clay lumps and other friable materials	0.25%	0.25%	0.50%
14. Rubber, plastic, bitumen, paper, cloth, paint, wood and other vegetable matter	0.3%	0.3%	0.5 %

Test methods

- 4.6. The processor must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.
- 4.7. The processor must ensure that the chemicals and other attributes (listed in Column 1 of Table 1) in the recovered glass sand it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.
 - 4.7.1. Test methods for measuring the mercury concentration:
 - 4.7.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated absolute maximum concentration in Table 1, Column 4 (i.e. 0.2 mg/kg dry weight).
 - 4.7.1.2. Report as mg/kg dry weight.
 - 4.7.2. Test methods for measuring chemicals 2 - 9:
 - 4.7.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils.
 - 4.7.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of the stated absolute maximum concentration in Table 1, Column 4, (i.e. 0.15 mg/kg dry weight for cadmium).
 - 4.7.2.3. Report as mg/kg dry weight.
 - 4.7.3. Test methods for measuring the total organic carbon content:
 - 4.7.3.1. Method 105 (Organic Carbon) and using a 2 gram sample in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 4.7.3.2. Reporting as % total organic carbon.
 - 4.7.4. Test methods for measuring the electrical conductivity:
 - 4.7.4.1. Sample preparation by mixing 1 part recovered aggregate 'as received' with 5 parts distilled water.
 - 4.7.4.2. Analysis using Method 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).
 - 4.7.4.3. Report in deciSiemens per metre (dS/m).

4.7.5. Test method for measuring the attributes 12 - 14:

4.7.5.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Aggregate (or an equivalent method), for the materials listed in 12 - 14 of Column 1, Table 1.

4.7.5.2. Report as %.

Notification

4.8. On or before each transaction, the processor must provide the following to each person to whom the processor supplies the recovered glass sand:

- a written statement of compliance certifying that all the requirements set out in this order have been met;
- a copy of the recovered glass sand exemption, or a link to the EPA website where the recovered glass sand exemption can be found; and
- a copy of the recovered glass sand order, or a link to the EPA website where the recovered glass sand order can be found.

Record keeping and reporting

4.9. The processor must keep a written record of the following for a period of six years:

- the sampling plan required to be prepared under clause 4.1.1;
- all characterisation, routine and/or one-off sampling results in relation to the recovered glass sand supplied;
- the quantity of the recovered glass sand supplied; and
- the name and address of each person to whom the processor supplied the recovered glass sand.

4.10. The processor must provide, on request, the most recent characterisation and sampling (whether routine or one-off or both) results for recovered glass sand supplied to any consumer of the recovered glass sand.

4.11. The processor must notify the EPA within seven days of becoming aware that it has not complied with any requirement in clause 4.1 to 4.7.

5. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply, recovered glass sand to land.

continuous process means a process that produces recovered glass sand on an ongoing basis.

processor means a person who processes, mixes, blends, or otherwise incorporates recovered glass sand into a material in its final form for supply to a consumer.

recovered glass is glass sourced from the collection of domestic or commercial waste. This includes glass collected from domestic commingled recycling collections. This does not include glass recovered from the sorting or processing of:

- mixed municipal waste, or
- mixed commercial and industrial waste, or
- construction and demolition waste, or
- Cathode Ray Tubes, or
- other glass recovered from electrical equipment, or
- fluorescent or incandescent lights.

transaction means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of recovered glass sand that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of recovered glass sand the first supply of recovered glass sand as required under the arrangement.

Manager Waste Strategy and Innovation

Environment Protection Authority

(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies recovered glass sand should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of recovered glass sand remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet.

Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.

Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014

The recovered glass sand exemption 2014

Introduction

This exemption:

- is issued by the Environment Protection Authority (EPA) under clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation); and
- exempts a consumer of recovered glass sand from certain requirements under the *Protection of the Environment Operations Act 1997* (POEO Act) and the Waste Regulation in relation to the application of that waste to land, provided the consumer complies with the conditions of this exemption.

This exemption should be read in conjunction with 'the recovered glass sand order 2014'.

1. Waste to which this exemption applies

- 1.1. This exemption applies to recovered glass sand that is, or is intended to be, applied to land for the purpose of pipe bedding, drainage or for road making activities.
- 1.2. Recovered glass sand means recovered glass that has been processed to produce a 'sand-like' glass material with a particle size diameter generally less than 5 mm, and that contains at least 98% recovered glass.

2. Persons to whom this exemption applies

- 2.1. This exemption applies any person who applies, or intends to apply, the recovered glass sand to land as set out in 1.1.

3. Duration

- 3.1. This exemption commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Premises to which this exemption applies

- 4.1. This exemption only applies to the premises at which the consumer's actual or intended application of recovered glass sand is carried out.

5. Revocation

- 5.1. 'The recovered glass sand exemption 2010' which commenced on 14 June 2010 is revoked from 24 November 2014.

6. Exemption

- 6.1. Subject to the conditions of this exemption, the EPA exempts each consumer from the following provisions of the POEO Act and the Waste Regulation in relation to the consumer's actual or intended application of recovered glass sand to land as pipe bedding, drainage or for road making activities at the premises:
- section 48 of the POEO Act in respect of the scheduled activities described in clauses 39 and 42 of Schedule 1 of the POEO Act;
 - Part 4 of the Waste Regulation;
 - section 88 of the POEO Act; and
 - clause 109 and 110 of the Waste Regulation.
- 6.2. The exemption does not apply in circumstances where recovered glass sand is received at the premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

7. Conditions of exemption

The exemption is subject to the following conditions:

- 7.1. At the time the recovered glass sand is received at the premises, the material must meet all chemical and other material requirements for recovered glass sand which are required on or before the supply of recovered glass sand under 'the recovered glass sand order 2014'.
- 7.2. The recovered glass sand can only be applied to land for the purpose of pipe bedding, drainage or for road making activities.
- 7.3. The consumer must keep a written record of the following for a period of six years:
- the quantity of any recovered glass sand received; and
 - the name and address of the supplier of the recovered glass sand received.
- 7.4. The consumer must make any records required to be kept under this exemption available to authorised officers of the EPA on request.
- 7.5. The consumer must ensure that any application of recovered glass sand to land must occur within a reasonable period of time after its receipt.

8. Definitions

In this exemption:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

consumer means a person who applies, or intends to apply, recovered glass sand to land.

recovered glass is glass sourced from the collection of domestic or commercial waste. This includes glass collected from domestic commingled recycling collections. This does not include glass recovered from the sorting or processing of:

- mixed municipal waste, or
- mixed commercial and industrial waste, or
- construction and demolition waste, or
- Cathode Ray Tubes or other glass recovered from electrical equipment, or fluorescent or incandescent lights.

Manager Waste Strategy and Innovation
Environment Protection Authority
(by delegation)

Notes

The EPA may amend or revoke this exemption at any time. It is the responsibility of the consumer to ensure they comply with all relevant requirements of the most current exemption. The current version of this exemption will be available on www.epa.nsw.gov.au

In gazetting or otherwise issuing this exemption, the EPA is not in any way endorsing the use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this exemption are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this exemption nor the accompanying order guarantee that the environment, human health or agriculture will not be harmed.

The consumer should assess whether or not the recovered glass sand is fit for the purpose the material is proposed to be used for, and whether this use will cause harm. The consumer may need to seek expert engineering or technical advice.

Regardless of any exemption provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The receipt of recovered glass sand remains subject to other relevant environmental regulations in the POEO Act and the Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of having an exemption, is guilty of an offence and subject to prosecution.

This exemption does not alter the requirements of any other relevant legislation that must be met in utilising this material, including for example, the need to prepare a Safety Data Sheet (SDS).

Failure to comply with the conditions of this exemption constitutes an offence under clause 91 of the Waste Regulation.

Appendix B

Materials Tracking Register Proforma

Materials Tracking Record

[illegible]

APPENDIX P

Waste Management Plan



global environmental solutions

Goodman Property Services
Oakdale West Estate
Waste Management Plan

Report Number 610.15612-R1

23 March 2017

Goodman Property Services

Level 17

60 Castlereagh St

Sydney NSW 2000

Australia

Version: v1.1

Goodman Property Services

Oakdale West Estate

Waste Management Plan

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This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. 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 Goodman Property Services. 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 SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR Consulting) was commissioned by Goodman Property Services to prepare a Waste Management Plan (WMP) for the construction and operation of warehouse and distribution facilities located at Oakdale West, Horsley Park, NSW, as part of Stage 1 Development Application works.

The WMP has been undertaken in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for the State Significant Development (SSD 15_7348) application.

1.1 Scope

This WMP applies to the construction and on-going operation of the proposed development.

The provisions contained in this WMP must be implemented for all stages of the development, and may be subject to review upon expansion or changes in operational procedures.

- See **Section 5** for the Construction WMP.
- See **Section 6** for the Operational WMP.

1.2 Objectives

The principal objective of this WMP is to identify all potential wastes likely to be generated at the site during development and operational phases of the Project, including a description of how waste would be handled, processed and disposed of (or re-used/recycled), in accordance with Council requirements.

The specific objectives of this WMP are as follows:

- to encourage the minimisation of waste production and maximisation of resource recovery;
- to ensure the appropriate management of contaminated/hazardous waste;
- to identify procedures and chain of custody records for waste management; and
- to assist in ensuring that any environmental impacts during the operational life of development comply with Secretary's Environmental Assessment Requirements (SEARs) and the conditions of other relevant regulatory authorities.

2 BETTER PRACTICE FOR WASTE MANAGEMENT AND RECYCLING

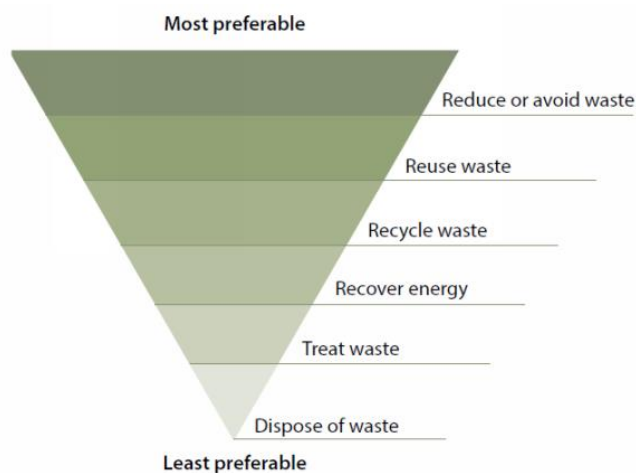
2.1 Waste Management Hierarchy

Where appropriate, this WMP aims to meet the principles of the waste management hierarchy, by promoting waste as a resource through the following in order of preference:

- Waste avoidance through prevention or reduction of waste generation (waste avoidance is best achieved through better design and purchasing choices).
- Waste reuse, without substantially changing the form of waste.
- Waste recycling through the treatment of waste that is no longer usable in its current form to produce new products.
- Energy recovery through thermal treatment of residual waste materials and from green waste processing.
- Waste disposal, in a manner that causes the least harm to the natural environment.

The waste hierarchy pictured below demonstrates a classification of waste management options in order of their environmental impacts, as established under the Waste Avoidance and Resource Recovery Act 2001.

Figure 1 Waste Hierarchy¹



Source: NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (EPA 2011)

2.2 Benefits of Implementing Better Practice for Waste Management and Recycling

The benefits of implementation better practices for waste management and recycling include:

- Enhanced social and environmental reputation of an organisation.
- Reduced costs associated with waste disposal.
- Benefits to all stakeholders and the wider community.
- Improved environmental outcomes.

¹ NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (EPA 2014)

3 WASTE LEGISLATION AND GUIDANCE

The legislation and guidance outlined in **Table 1** below should be referred to during construction and operational phases of the development.

Table 1 Waste legislation and guidance summary

Legislation	Objectives
Secretary Environmental Assessment Requirements (SEARs)	As outlined in SSD 15_7348 – provide a construction and operational waste management plan.
Waste Avoidance and Resource Recovery Act 2001	<p>To promote extended producer responsibility in place of industry waste reduction plans.</p> <p>Specific objectives include:</p> <ul style="list-style-type: none"> To encourage efficient use of resources. To 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. To ensure that industry shares with the community the responsibility for reducing and dealing with waste. To ensure the efficient funding of waste and resource management planning, programs and service delivery.
Protection of the Environment Operations Act (POEO) 1997 & Amendment Act 2011	<p>Administered by the NSW Environmental Protection Authority (EPA) to enable the Government to establish instruments for setting environmental standards, goals, protocols and guidelines.</p> <p><i>Important Note: The owner of a premises, the employer or any person carrying on the activity which causes a pollution incident is to immediately notify the relevant authorities when material harm to the environment is caused or threatened.</i></p> <p>A list of each relevant authority is provided in the POEO Amendment Act and will be noted in the site's incident register.</p>
POEO (Waste) Regulation 2014	Contains provisions relating to the waste levy, waste tracking, management requirements for certain waste types, payment schemes for councils, consumer packaging recycling and other miscellaneous provisions.
NSW EPA's Waste Classification Guidelines (Part 1) 2014	To assist waste generators to effectively classify, manage, treat and dispose of waste to ensure the environmental and human health risks associated with waste are managed appropriately and in accordance with the POEO Act and its associated regulations.
Building Code of Australia (BCA) and relevant Australian Standards	The BCA has the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently.
Council's Waste Management Planning Requirements	<p>To promote responsible waste disposal/recycling options by providing information and advice on waste services available in the area.</p> <p>Information available to contractors includes the Western Sydney Recycling Directory with details of waste contractor services and the materials they will accept for recycling/disposal.</p>
EPA's Waste Avoidance and Resource Recovery (WARR) Strategy 2014-21	A key component of the State Government's vision for the environmental and economic future of the state that will be supported financially by the <i>Waste Less, Recycle More</i> funding initiative providing long-term targets for 6 key result areas including reduced illegal dumping.
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	The EPA's Better Practice Guidelines (2012) encourage efficient waste minimisation and resource recovery for commercial and industrial facilities and is used as a benchmark document when assessing waste production rates within Australia and details a range of waste management provisions.
Australian Packaging Covenant	<p>Each building should be encouraged to establish an Action Plan to demonstrate their contribution to the achievement of the Australian Packaging Covenant's (APC) goals.</p> <p>The three main performance goals of the APC are:</p> <ul style="list-style-type: none"> Design: Optimise packaging to use resources efficiently and reduce environmental impact without compromising product quality/safety. Recycling: Efficiently collect and recycle packaging. Product Stewardship: Demonstrate commitment of all signatories.

4 PROJECT DESCRIPTION

Goodman Property Services (Aust) Pty Ltd is developing the Oakdale West site (Lot 11 in DP 1178389) at Erskine Park for the purposes of providing a warehouse and distribution complex. The Oakdale West site is a portion within the wider Oakdale Estate development and forms part of a progressive development designed to make Oakdale a regional distribution park of warehouses, distribution centres and freight logistics facilities.

The Oakdale West project is a staged development which includes bulk earthworks, civil works and the construction of infrastructure and stormwater management.

4.1 Overview of Proposed Development

The overall Oakdale West Estate is a 154 hectare (ha) site located within the Oakdale Estate, a 421 ha area of land within the Western Sydney Employment Area. Oakdale West Estate is the third of four stages of the broader Oakdale Estate under the management of Goodman Limited.

Oakdale West is essentially a greenfield site at present which has been used for stock grazing. The surrounding areas are primarily rural in nature, but, the area to the north is becoming more industrial. Land uses in the surrounding area include:

- Rural (grazing, market gardens, etc) and rural residential to the south-east, south and west.
- Sydney Water Pipeline and industrial land to the north (industrial zones at Eastern Creek to the north and Erskine Park to the north-west).
- To the west land uses include a number of sensitive uses such as an aged care facility (Catholic Health Care) and three schools: Mamre Anglican School, Emmaus Catholic College and Trinity Primary School. Other land uses include recreational and sporting facilities.

Oakdale West Estate will be developed as five separate precincts, commencing with Precinct 1. Development of Precinct 1 will involve:

- Bulk earthworks.
- Installation of trunk infrastructure.
- Landscaping and public domain works.
- Development (comprising the construction and operation) of three warehouse and distribution facilities in Precinct 1 (Warehouses 1A, 1B and 1C).

The Precinct 1 development area comprises 22.41 ha. An overview of the site is provided in **Figure 2** to **Figure 5** overleaf. Building areas are outlined in **Table 2**.

Figure 2 Overview of the Oakdale West Estate showing Precinct 1 Development Area

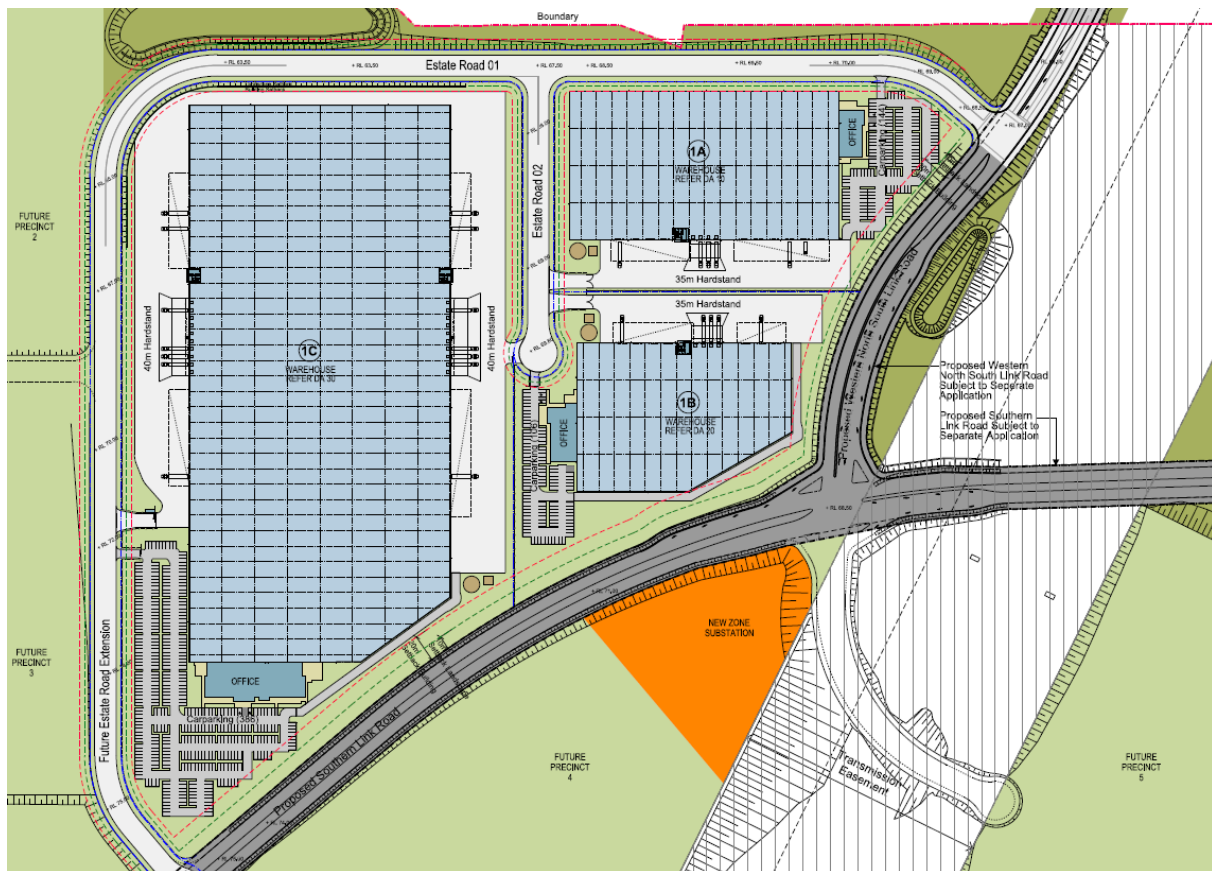


Source: Goodman / SBA Architects (2017)

Table 2 Building Areas

Site Area (m ²)	Lot 1A	Lot 1B	Lot 1C
Warehouse	21,115	15,190	75,255
Office (2 levels)	1,180	800	3,725
Dock office (2 levels)	190	190	380
Total Building Area	22,485	16,180	79,360
Awning	1,985	1,410	4,850
Hardstand area	6,773	6,055	27,980
Light duty area	4,425	2,832	9,994
Car parking	144	106	386

Figure 3 Oakdale West Estate, Horsley Park – Lot Warehouses 1A, 1B and 1C



Source: Goodman / SBA Architects (2016)

5 CONSTRUCTION WASTE MANAGEMENT

Construction stages of developments have the greatest potential for waste minimisation.

Key construction activities will include:

- construction of new warehouse buildings;
- construction of access ways; and
- construction and modification of entries/exits from main roads and access ramps connecting (not calculated as part of this WMP).

5.1 Targets for Resource Recovery

The performance of each development contributes to overall NSW State recycling targets, which for the construction and demolition (C&D) sector, is 75% (increasing to 80% by the year 2021) of total C&D waste recycled (see NSW WARR Strategy 2014-21).

Waste minimisation measures that can be implemented to assist in achieving this resource recovery target are provided in the following sections. Waste audits will determine the actual percentage of wastes that were recycled and disposed of at landfill during the Project.

5.2 Waste Streams and Classifications

The development is likely to generate the following broad waste streams:

- excavation material;
- construction wastes;
- plant maintenance waste;
- packaging waste;
- packaging waste;
- green waste from site clearing activities;
- work compound (on-site employee) waste; and
- wastewater.

Possible waste types along with their waste classification are provided below in **Table 3**. For further information on how to determine a waste's classification, refer to the EPA's Waste Classification Guidelines (2014).

Table 3 Potential Waste Generation and EPA Classifications (Construction Related)

Waste Types	NSW Classification	Proposed Reuse / Recycling / Disposal Method
Site Preparation, Excavation and Construction		
Sediment fencing, geotextile materials	General solid (non-putrescible) waste	Reuse at other sites where possible or disposal to landfill
Concrete (solids and washouts) and asphalt	General solid (non-putrescible) waste	Reuse at other sites where possible or disposal to landfill
Steel reinforcing, other metal (e.g. wire mesh)	General solid (non-putrescible) waste	Off-site recycling
Conduits and pipes	General solid (non-putrescible) waste	Off-site recycling
Timber formwork	General solid (non-putrescible) waste	Reuse on-site or off-site recycling
Metals and bulk electrical cabling	General solid (non-putrescible) waste	Off-site recycling

Waste Types	NSW Classification	Proposed Reuse / Recycling / Disposal Method
Plasterboard	General solid (non-putrescible) waste	Off-site recycling or disposal
Bricks	General solid (non-putrescible) waste	Off-site recycling
Glass	General solid (non-putrescible) waste	Off-site recycling
Light bulbs	Hazardous waste	Off-site recycling
Plant Maintenance		
Tyres	Special waste	Off-site recycling or disposal
Empty oil and other drums / tins (e.g. fuel, chemicals, paints, spill clean ups)	Hazardous waste if the containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and from which residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if the containers have been cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility. (Note: Discharge to sewer subject to Trade Waste Agreement with local Council.) 1
Air and oil filters and rags	General solid (non-putrescible) waste	General solid (non-putrescible) waste
Batteries	Hazardous waste	Off-site recycling
Packaging		
Packaging materials, including wood, plastic (including stretch wrap or LLPE), cardboard and metals	General solid (non-putrescible) waste	Off-site recycling
Wooden crates	General solid (non-putrescible) waste	Reused for similar projects, returned to suppliers, or off-site recycling
Work Compound and Associated Offices		
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid (non-putrescible) waste	Co-mingled recycling at off-site licensed facility
Clean paper and cardboard	General solid (non-putrescible) waste	Paper and cardboard recycling at off-site licensed facility
General domestic waste generated by workers (soiled paper and cardboard, food stuffs, polystyrene)	General solid (non-putrescible) waste mixed with putrescible waste	Disposal at landfill
Pump-out waste and septage (sewage)	Liquid (trade) waste	Off-site disposal at licensed facility or disposal direct to sewer where arranged with Council

5.3 Waste Generation Rates

The Construction Site Manager will need to specify the types and quantities of wastes produced during construction and on this basis, the numbers and capacity of skip bins can be determined.

A guide/estimate of the potential waste percentages is provided based on published waste generation rates for construction and demolition projects, as indicated in **Table 4**.

Table 4 Guideline to Waste Composition and Volumes – Construction of General Buildings

Material	Split of Waste % (General Building)	Conversion Factors (tonnes per m ³)
Hard material	32%	1.20
Timber	24%	0.34
Plasterboard	15%	0.33
Concrete	9%	1.27
Metals	6%	0.42
Plastics	6%	0.25
Cardboard	4%	0.20
Green waste	3%	0.15
Soil	1%	1.20
Other	0.3%	0.30

Source: UK WRAP 2014

The UK Department for Environment, Food and Rural Affairs (Defra) and the UK Building Research Establishment (BRE) have developed a number of benchmark indicators to help determine approximate tonnages of waste produced during various construction projects including civil engineering and commercial retail works. The benchmarks include Environmental Performance Indicators (EPI) which measure the volume (m³) of waste produced per 100 m².

The EPI indicators provided in **Table 5** below have been used for the purposes of this WMP to estimate the amounts of demolition and construction wastes generated by the Project.

Table 5 Environmental Performance Indicator for Waste Volumes from New Developments

Project Type	Average Volume (m ³) of Waste per 100m ²
Industrial Buildings	14.0
Civil Engineering	28.1

5.3.1 Estimation of Waste Volumes

The estimated waste volumes for the warehouse and office space areas are presented below in **Table 6**, **Table 7** and **Table 8**. The waste arisings are based on the EPI estimates presented above in **Table 5**.

Actual waste tonnage and composition will vary however this estimate is provided so that the Construction Site Manager can make provision for on-site or off-site re-use and recycling opportunities.

Table 6 Estimated Waste Volumes and Materials for Lot 1A

Material	Split %	Waste (m ³)	Conversion Factor	Waste (tonnes)
Hard material	40%	2,154	1.20	2,585
Timber	16%	862	0.34	293
Plasterboard	7%	377	0.33	94
Concrete	10%	539	1.27	269
Metals	14%	754	0.42	151
Plastics	8%	431	0.25	181
Cardboard	2%	108	0.20	43
Greenwaste	2%	108	0.15	16
Soil	0%	0	1.20	0
Chemicals / paint	1%	54	0.30	16
TOTAL	100%	5,386	-	3,649

Table 7 Estimated Waste Volumes and Materials for Lot 1B

Material	Split %	Waste (m ³)	Conversion Factor	Waste (tonnes)
Hard material	40%	1,601	1.2	1,921
Timber	16%	640	0.34	218
Plasterboard	7%	280	0.33	70
Concrete	10%	400	1.27	200
Metals	14%	560	0.42	112
Plastics	8%	320	0.25	134
Cardboard	2%	80	0.2	32
Greenwaste	2%	80	0.15	12
Soil	0%	0	1.2	0
Chemicals / paint	1%	40	0.3	12
TOTAL	100%	4,002	-	2,711

Table 8 Estimated Waste Volumes and Materials for Lot 1C

Material	Split %	Waste (m³)	Conversion Factor	Waste (tonnes)
Hard material	40%	7,301	1.2	8,761
Timber	16%	2,920	0.34	993
Plasterboard	7%	1,278	0.33	319
Concrete	10%	1,825	1.27	913
Metals	14%	2,555	0.42	511
Plastics	8%	1,460	0.25	613
Cardboard	2%	365	0.2	146
Greenwaste	2%	365	0.15	55
Soil	0%	0	1.2	0
Chemicals / paint	1%	183	0.3	55
TOTAL	100%	18,251	-	12,365

5.4 Waste Avoidance Measures

The Construction Site Manager will identify opportunities for waste avoidance by:

- applying practical building designs and construction techniques;
- appropriate sorting and segregation of demolition and construction wastes to ensure efficient recycling of wastes;
- selecting construction materials taking into consideration to their long lifespan and potential for reuse;
- ordering materials to size and ordering pre-cut and prefabricated materials;
- reuse of formwork;
- planned work staging;
- use of naturally ventilating buildings to reduce ductwork;
- use of prefabricated components for internal fit outs;
- reducing packaging waste on-site by returning packaging to suppliers where possible and practicable, purchasing in bulk, requesting cardboard or metal drums rather than plastics, requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
- careful on-site storage and source separation;
- subcontractors informed of site waste management procedures; and
- co-ordination and sequencing of various trades.

The Construction Site Manager should also advise on material selection for the reduction of embodied energy and resource depletion. This includes the use of recycled concrete and steel, the reduction of PVC use, the use of low volatile organic compounds (VOC) paints and adhesives, and the use of postconsumer reused timber or Forest Stewardship Council (FSC) certified timber. Designs enabling disassembly and reuse of materials are also desirable.

The following measures will also be completed to improve onsite waste management and to provide more reliable figures:

- record waste generated and disposal methods used during the construction;
- conduct waste audits of current projects;
- compare projected waste quantities with actual waste quantities produced during the construction period;
- review at past waste disposal receipts; and
- record this information to help in waste estimations for future waste management plans.

5.5 Re-use, Recycling and Disposal

Effective management of construction materials and demolition/construction waste, including options for reuse and recycling where applicable and practicable, will be conducted. Only project wastes that cannot be cost effectively reused or recycled are to be sent to landfill or appropriate disposal facilities.

The following procedures are to be implemented:

- all solid waste timber, brick, concrete, rock that cannot be reused or recycled will be taken to an appropriate landfill site and disposed of in an approved manner;
- all metals will be recycled where economically viable;
- waste oil will be recycled or disposed of in an appropriate manner;

- all asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with Workcover Authority and EPA requirements;
- washdown equipment/plant/machinery and concrete delivery trucks within a specified, appropriately bunded, washdown bay or return to the batching plant before washing out. Liquid waste is often produced from the washing down of plant and apparatus. There may be a local sewer that this waste water can be connected to; alternatively, this could be transferred into a localised waste water treatment facility or plant;
- completion of refuelling activities in designated areas with appropriate spill containment measures to avoid overspill to sensitive areas;
- provision of portable, self-contained toilet and washroom facilities at the site ensuring these units are regularly emptied and serviced by a suitably licensed contractor;
- where applicable, provide coloured, clearly labelled coordinated and easily accessible, co-mingled and paper/cardboard recycling bins on-site for employee use nearby common areas for large work compounds/work sites;
- dispose of general waste via a council approved system; and
- investigate any opportunities for materials exportation and reuse with other local construction operations. This will have two benefits: minimising energy through reduction of material reprocessing, encouraging material reuse.

5.5.1 Site Specific Procedures

The Construction Site Manager will also consider implementation of the following procedures:

- all used crates will be stored for reuse unless damaged;
- all cardboard waste is to be recycled via on-site recycling compactors which shall be collected by an appropriate recycling contractor;
- all glass and metals that can be economically recycled will be.
- all re-enforcing mesh to be utilised within the construction stages of the construction;
- colour bond roof material off cuts to be stockpiled on site for reuse or recycling;
- waste concrete will be disposed of at a crushing/recycling plant where practicable;
- waste bricks will be crushed and utilised on site. All half/damaged bricks and blacks will be stored on site to be removed for offsite crushing and recycling;
- excavation material will be reused on-site where possible with all excess reused on other projects or sold;
- All other solid waste including bitumen paving, tile, timber, rock and soil will be taken to an appropriate materials recycling facility/landfill site and processed in an approved manner; and
- All garbage will be disposed of via a council approved system.

5.6 Waste Storage and Servicing

5.6.1 Waste Segregation

The project will be managed ensuring effective source separation and appropriate collection of waste during demolition and construction works to minimise waste and maximise the potential for materials to be re-used and recycled.

For construction stages, consider minimum dedicated skips/bins/stockpiles for these materials:

- timber/wood;
- steel/scrap metal;
- bricks;
- concrete;
- general waste; and
- other waste (i.e. for the collection of materials that may be re-used on future projects).

Where limited room is available for segregation of construction materials, consultation with recycling facilities will be undertaken to determine which materials can be disposed of within the same skip and still be easily sorted post collection.

Separate receptacles for the safe disposal of hazardous waste types (light bulbs, batteries, etc.) will also be provided. Specialised bins for cigarette butts should also be provided to ensure these do not become a potential source of fire if thrown in bins / skips or litter washed into stormwater drains.

5.6.2 Space and Siting Requirements

Waste storage areas will be accessible and allow sufficient space for storage and servicing requirements. The storage areas will also be flexible in order to cater for change of use throughout the Project. Where space is restricted, dedicated stockpile areas are to be delineated on the site, with regular transfers to dedicated skip bins for sorting.

The positions of the designated waste holding areas on site will change according to building works and the progression of the development, but must consider visual amenity, OH&S and accessibility in their selection. Appropriate siting of waste stockpile locations will take into account slope and drainage factors to avoid contamination of stormwater drains during rain events.

All waste placed in skips or bins for disposal or recycling shall be adequately contained to ensure that the waste does not fall, blow, wash or otherwise escape from the site. Waste containers and storage areas are to be kept clean and in a good state of repair. Stockpiles of materials will be managed in accordance with relevant Environmental Guidelines.

5.6.3 Servicing and Transport

The frequency of the waste removal will, in most cases, be dictated by the volume of material being deposited into each of the dedicated skips. Skips/bins are to be checked on a daily basis by the Site Manager to ensure that no overflow occurs. If skips/bins are reaching capacity, removal and replacement should be organised for the next 24 hours. All skips/bins leaving the site will be covered with a suitable tarpaulin to ensure that the spillage of wastes from the skips whilst in transit is eliminated.

All waste collection for construction works are to be conducted between 7am and 7pm Monday to Friday, and between 7am and 1pm on Saturdays, or as per Council requirements. All site generated building waste collected in the skips and/or bins will leave the site and be deposited in the approved and appropriately licensed recycling centre, transfer station or landfill site.

5.6.4 Space and Amenity

Waste storage areas will be accessible and allow sufficient space for storage and servicing requirements. The storage areas will also be flexible in order to cater for change of use throughout the Project.

Where space is restricted, dedicated stockpile areas are to be delineated on the site, with regular transfers to dedicated skip bins for sorting. The positions of the designated waste holding areas on site will change according to building works and the progression of the development, but must consider visual amenity, OH&S and accessibility in their selection.

All waste placed in stockpile areas/skips for disposal or recycling shall be adequately contained to ensure that the waste does not fall, blow, wash or otherwise escape from the site. Appropriate siting of waste stockpile locations will take into account slope and drainage factors to avoid contamination of stormwater drains during rain events.

Waste containers are to be kept clean and in a good state of repair.

5.6.5 Contaminated / Hazardous Waste

During the construction phases of the development, there must be a commitment to engage qualified and certified contractors to remove all contaminated/hazardous materials (e.g. asbestos) and dispose of all contaminated/hazardous waste at an appropriately licenced facility, where applicable.

In the event that any contaminated or hazardous materials are unexpectedly uncovered during demolition or excavation works, the Construction Site Manager is to stop work immediately and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.

Contaminated material stockpiled on site will be minimised as far as possible and should be stored on HD polythene liner, in a bunded location which is protected from inclement weather. Sediment fences should also be installed around the base of stockpiles and the stockpiles should be covered. Where excavated material requires validations, samples should be taken for NATA laboratory testing as per the requirements of the contamination assessment prior to restoration works, backfilling exercises and disposal.

Any trucks carrying contaminated materials should be securely and completely covered immediately after loading the materials, to prevent windblown emissions and spillage.

Decontamination of all equipment prior to demobilisation from the site is important in order that contaminated materials are not spread off-site. This should be achieved using dry cleaning methods as far as practicable and collection of material for disposal. The following additional measures should be employed on site:

- as far as possible, all tracked surfaces to be kept free of contaminated material; and
- all equipment should be cleaned in an area contained contaminated soils so that they remain within the area, or on a lined surface and collected spoil should be treated as contaminated material.

5.6.6 Liquid Waste / Stormwater / Wastewater Management

Any liquid wastes or dangerous goods wastes generated by the construction activities (e.g. due to damage or leakage of containment) will be disposed of by a suitably qualified contractor to an appropriately licensed disposal facility.

Wastewater storage tanks (where applicable) will be carefully monitored to ensure overflow does not occur and no liquid wastes or wash down waters will be disposed of via the stormwater drainage system.

5.6.7 Spills Management

Spills on the worksite are most likely to involve fuel, hydraulic oil or engine oil spilled from plant items, and paints and solvents.

If a spillage occurs, site staff will immediately identify the spilled materials and notify the Construction Site Manager. Then contain the spill as soon as possible so it doesn't spread.

Containment measures for spillages will be provided at appropriate locations and in close proximity to staff car park areas, dangerous goods stores areas and main Project work areas (e.g. a spill kit containing non-combustible absorbent material).

Material Safety Data Sheets (MSDS) will also be located nearby spill kit areas for advice on spillage clean-up and disposal.

5.7 Signage

Standard signage will be posted in all storage/waste collection areas and all skips/drums/bins are required to be labelled correctly and clearly to identify materials stored within.

Where applicable, general and co-mingled recycling bins placed nearby staff tearoom/break areas will be colour coded with clear labels.

Refer to the EPA's website under 'waste tools' for construction waste and recycling signs.

Figure 4 Australian Standard Signs



Source: <http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm>

5.8 Training and Awareness

All staff (including sub-contractors and site staff) employed during the construction phases of the development must undergo induction training regarding waste management for the development site.

Induction training is to cover, as a minimum, an outline of the WMP including:

- legal obligations;
- emergency response procedures on site;
- waste storage locations and separation of waste;
- implications of poor waste management practices;
- correct use of General Purpose Spill Kit; and
- details of responsibility and reporting (including identification of personnel responsible for waste management and individual responsibilities).

It is the responsibility of the Construction Site Manager or Environmental Management Representative (EMR) to notify Council of the appointment of waste removal, transport or disposal contractors.

5.9 Monitoring and Reporting

Records of waste volumes recycled, reused or contractor removed are to be maintained and reported to the Principal Contractor on a quarterly basis. Additionally, dockets/receipts verifying recycling/disposal in accordance with the WMP must be kept and presented to Council when required.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists/logs recorded for reporting to the Construction Site Manager or EMR on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits are to be carried out by the EMR to gauge the effectiveness and efficiency of waste segregation procedures and recycling/reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training will be undertaken and signage re-examined.

All environmental incidents are to be dealt with promptly to minimise potential impacts. An incident register must be maintained on-site at all times and include the contact details of the 24 hour EPA Pollution line. Likely incidents to occur during the construction phase of the Project may involve fuel or chemical spills, seepage or mishandling of hazardous waste, or unlicensed discharge of pollutants to environment.

5.10 Incident Response

Likely incidents to occur during the construction phase of the Project may involve fuel or chemical spills, seepage or mishandling of hazardous waste, or unlicensed discharge of pollutants to the environment.

All environmental incidents are to be dealt with promptly to minimise potential impacts. An incident register must be maintained on-site at all times and include the contact details of the 24 hour EPA Pollution line.

5.11 Roles and Responsibilities

All personnel have a responsibility for their own environmental performance and compliance with all legislation. It will be the responsibility of the Contractor to implement the WMP, and an employee responsibility to ensure that they comply with the guideline at all times.

Where possible, an Environmental Management Representative (EMR) should be appointed for the Project. Suggested roles and responsibilities are provided below.

Table 9 Recommended Roles and Responsibilities

Construction Site Manager	Ensuring plant and equipment are well maintained. Ordering only the required amount of materials. Keeping materials segregated to maximise reuse and recycling. Ultimately responsible for routinely check waste sorting and storage areas for cleanliness, hygiene and OH&S issues, contaminated waste materials, and also ensuring that all monitoring and audit results are well documented and carried out as specified in the WMP.
Environmental Management Representative (EMR)	Approaching and establishing the local commercial reuse of materials where reuse on-site is not practical. Establishing separate skips and recycling bins for effective waste segregation and recycling purposes. Training and awareness of the requirements of the WMP and specific waste management strategies adopted for the Project. Contaminated waste management and approval of off-site waste transport, disposal locations and checking licensing requirements. Approval of off-site waste disposal locations and checking licensing requirements. Assessment of suspicious potentially contaminated materials, hazardous materials and liquid wastes. Monitoring, inspection and reporting requirements.

Daily visual inspections of waste storage areas may be delegated to other on site staff. All subcontractors will be responsible for ensuring that their work complies with the WMP through the site induction and contract engagement process.

6 OPERATIONAL WASTE MANAGEMENT

Ineffective waste management for commercial premises can lead to environmental pollution, offensive odours, litter, attraction of vermin and occupational safety and hygiene problems.

Effective waste management reduces costs through the reuse of resources and minimisation of fees associated with removal, transportation and disposal of waste, and improves environmental outcomes locally, regionally and globally.

Effective waste management is achieved through the implementation of a WMP for the operational life of the development.

6.1 Targets for Resource Recovery

The performance of each development contributes to overall NSW State recycling targets, which for the commercial and industrial (C&I) sector, represents 57% (increasing to 70% by 2020-21) of total C&I waste recycled (see NSW WARR Strategy 2014-21).

Waste minimisation measures that can be implemented to assist in achieving this resource recovery target are provided in the following sections. Waste audits will determine the actual percentage of wastes that were recycled and disposed of at landfill during operations.

6.2 Waste Streams and Classifications

The operation of the Project will generate the following broad waste streams:

- employee wastes (i.e. general waste and co-mingled recycling);
- packaging wastes (cardboard, paper, plastic, timber/ pallets, polystyrene);
- office wastes;
- garden organics from landscaped areas;
- bulky waste items such as furniture and e-waste;
- amenity wastes; and
- stores, plant and general maintenance wastes.

Potential waste types along with their waste classification are provided below in **Table 10**. For further information on how to determine a waste's classification, refer to the EPA's Waste Classification Guidelines (2014).

Table 10 Potential Waste Generation and EPA Classifications (Operational)

Waste Types	NSW Classification	Proposed Reuse / Recycling / Disposal Method
General Operations		
General garbage (including non-recyclable plastics)	General solid (putrescible and non-putrescible) waste	Disposal at landfill
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid (non-putrescible) waste	Co-mingled recycling at off-site licensed facility
Clean office paper	General solid (non-putrescible) waste	Paper recycling at off-site licensed facility
Cardboard / Bulk Cardboard	General solid (non-putrescible) waste	Cardboard recycling at off-site licensed facility
Plastic packaging materials (including stretch wrap, polystyrene)	General solid (non-putrescible) waste	Baled and sent for off-site recycling

Waste Types	NSW Classification	Proposed Reuse / Recycling / Disposal Method
Wooden crates / pallets / timber	General solid (non-putrescible) waste	Reused for similar projects, returned to suppliers, or off-site recycling
E-waste, batteries, printer toners and ink cartridges	Hazardous waste	Off-site recycling (free disposal box / bags and pickup service exists for printer toners and ink cartridges)
Wastewater from amenities and kitchens	Liquid waste	Disposal to sewerage
Sanitary waste	General solid (putrescible) waste	Contractor disposal at licensed facility
Maintenance		
Spent smoke detectors ¹	General solid (non-putrescible) waste OR Hazardous waste (some commercial varieties)	Disposal to landfill OR off-site disposal at licensed facility
Light bulbs / fluorescent tubes	Hazardous waste	Off-site recycling
Cleaning chemicals, laundry chemicals (bleach etc.), solvents, area wash downs, empty oil / paint drums / chemical containers	Hazardous waste if containers used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if containers cleaned by washing or vacuuming	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility. (Note: Discharge to sewer subject to Trade Waste Agreement with Sydney Water) ¹
Air-conditioning parts and filters	General solid (non-putrescible) waste	Disposal to landfill
Garden organics / green waste (lawn mowing, tree branches, hedge cuttings, leaves etc.)	General solid (non-putrescible) waste	Option to reuse on site as mulch or to organise collection. Alternatively, contractor/gardener removal for recycling at licensed facility.

Source: <http://www.environment.nsw.gov.au/waste/envguidlns/index.htm>

Note 1: The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) require that when more than 10 smoke alarms (particularly americium-241 sources) are collected for bulk disposal they must be treated as radioactive waste and the requirements of the National Health and Medical Research Council's *Code of practice for the near-surface disposal of radioactive waste in Australia (1992)* must be met. Contact ARPANSA for more information. http://www.arpansa.gov.au/radiationprotection/factsheets/is_smokedetector.cfm

6.2.1 Estimated Waste Generation Rates for Operational Development

Published average waste generation rates have been used to calculate the anticipated waste amounts for the proposed development. The estimated waste generation rates are based on EPA guidance for waste generation in commercial and retail premises as presented below in **Table 11**.

Table 11 Guideline Waste Generation Rates

Type of Premises	Facility Area	General Waste Generation	Recycling Generation ¹
Warehouse	Industrial Storage	30 L/100 m ² /day	30 L/100 m ² /day
Offices	Offices	10 L/100 m ² /day	10 L/100 m ² /day

Source: NSW EPA's Better Practice Guidelines for Waste Management and Recycling in C&I Facilities (2012)

Note 1. Recyclable waste generation includes paper and cardboard waste, as well as mixed recyclables (bottles, cans etc.)

The approximate volumes have been converted into tonnes by applying conversion rates taken from Victoria's Ecorecycle Waste Wise Events toolkit for 'garbage' (0.15 tonnes per 1000 L) and 'co-mingled containers' (0.063 tonnes per 1000 L).

Using the above standard industry waste generation rates in **Table 11** above, the approximate daily waste volumes for each Lot have been calculated and are presented in **Table 12** to Error! Reference source not found..

Table 12 Estimated Annual Waste and Recycling Generation for Lot 1A

Complex	Area Type	Garbage Average L/day	Recycling Average L/day	Garbage Average L/wk	Recycling Average L/wk
Lot 1A	Warehouse	6,335	6,335	31,673	31,673
	Office	137	137	685	685
Total	Volume	6,472	6,472	32,358	32,358
	Tonnes	1.0	0.4	4.9	2.0
Lot 1B	Warehouse	4,557	4,557	22,785	22,785
	Office	99	99	495	495
Total	Volume	4,656	4,656	23,280	23,280
	Tonnes	0.7	0.3	3.5	1.5
Lot 1C	Warehouse	22,577	22,577	112,883	112,883
	Office	411	411	2,053	2,053
Total	Volume	22,987	22,987	114,935	114,935
	Tonnes	3.4	1.4	17.2	7.2

Note: Waste generation rates assume warehousing facilities are operational 5 days per week.

6.3 Waste Storage and Servicing Requirements

A dedicated waste storage area will be identified within each building with enough space to contain all the bins and equipment required for the building. This includes bins of suitable sizes (1000 litre bins or larger front-lift bins) and the installation of a cardboard baler will be reviewed within 12 months of operation. Sufficient clearance has been provided to enable collection vehicles to access the bin storage area.

6.3.1 Space Requirements

Waste/recycling storage areas will be constructed of an adequate size to accommodate all waste and recycling bins associated with the development.

Doors/gates to the storage area will be able to be opened from both the inside and outside and wide enough to allow for easy passage of waste/recycling containers.

Sufficient space will be provided for the segregation and storage of varying waste types including provision for the collection of fluorescent tubes, smoke detectors, e-wastes and other recyclable resources.

Sufficient space will also be provided for reuse items such as crates and pallets for occupational safety purposes.

6.3.2 Waste and Recycling Storage Area

To encourage employee recycling, general landfill waste and comingled recycling bins will be positioned in easily accessible areas for effective recycling results, including along walkways and aisles, inside any food retailer's kitchen area, and at pedestrian entry/exit points to the car park levels to deal with waste management on these levels.

The waste and recycling storage area should also incorporate a number of measures to ensure best practice waste management including:

- Storage of cardboard and paper must be in a dry, vermin-proof area and must not be stored for more than two weeks in order to prevent infestation by pests.
- Provisions must be made for the separation of hazardous materials, cardboard, paper and recyclable plastics at each holding area in addition to the centralised waste storage area.
- Waste and recyclables from each holding area within the premises must be transferred to a centralised waste and recycling storage area.
- Centralised storage areas should be conveniently located for servicing multiple tenants, and loading docks located close to areas requiring waste servicing and garbage chutes/ramps. The construction of additional garbage areas, rooms and equipment are to comply with BCA (Building Code of Australia) requirements and Australian Standards.
- The storage area should be under cover (e.g. awning).
- All waste sorting and storage areas are to be kept clean and odour and vermin free. It is the responsibility of the Operations Manager or equivalent personnel to check each waste sorting and storage areas for cleanliness, hygiene and OH&S issues.

6.3.3 Waste Collection Area

Waste and recyclables will be transported to a designated waste collection area the evening or morning prior to the scheduled collection time. Where possible collection times should not coincide with peak operational delivery schedules however all areas identified will not interfere with operational truck movements.

6.3.4 Bulky / Hazardous Waste Management

Sufficient space will be provided within the development for the storage of large and/or bulky items (eg. broken pallets, broken storage units and e-waste (recyclable electronic equipment, including televisions, batteries, fluorescent tubes and smoke detectors)) that cannot be disposed of in the general or recyclable waste stream.

Space will also be allocated to store reusable items such as crates so that storage in a public place is avoided.

Management may consider organising a skip on a monthly basis or as required to remove bulky waste items, or engage a contractor to collect and transport these items for reuse, recycling or disposal at an EPA licensed facility.

A suitably licensed e-waste recycling contractor will be engaged to collect and recycle all e-waste items generated at the facility.

6.3.5 Liquid Waste

- Liquid, semi-liquids or moist substances will not be placed in waste containers, unless securely wrapped or contained to prevent the substance from leaking.
- Any liquid wastes or dangerous goods wastes generated by the development (e.g. due to damage or leakage of containment) should be disposed of by a suitably qualified contractor to an appropriately licensed disposal facility.
- No liquid wastes or wash down waters should be disposed of via the stormwater drainage system. Wastewater storage tanks (including stormwater collection tanks) should be carefully monitored to ensure overflow does not occur.

6.3.6 Stormwater Treatment

Car parking areas must drain to a stormwater treatment device capable of removing litter, oil, grease and sediment prior to discharge to the stormwater system.

All wastewater and stormwater treatment devices are required to be regularly maintained and cleaned to ensure these devices remain effective, with all solid and liquid wastes collected from these devices disposed of in accordance with this WMP and the POEO Act.

6.3.7 Spills Management

Containment measures for spillages should be provided at appropriate locations and in close proximity to staff car park areas, dangerous goods stores areas and main warehouse operation areas (e.g. a spill kit containing non-combustible absorbent material). Material Safety Data Sheets (MSDS) should also be located nearby spill kit areas for advice on spillage clean up and disposal.

6.4 Waste Avoidance, Reuse and Recycling Measures

Some examples of how the reduction, re-use and recycling of waste can be achieved are listed below.

6.4.1 Waste Avoidance

- provision of take back services to clients to reduce waste further along the supply chain;
- re-work/re-packaging of products prior to local distribution to reduce waste arisings;
- review of packaging design to reduce waste but maintain 'fit for purpose'; and
- investigate leasing office equipment and machinery rather than purchase and disposal.

6.4.2 Re-use

- establish systems with in-house and with supply chain stakeholders to ship products in reusable packaging where possible

6.4.3 Recycling

- development of 'buy recycled' purchasing policy
- flatten or bale cardboard to reduce number of bin lifts required
- provide recycling collections within each of the offices (e.g. plastics, cans and glass)

6.5 Signage

Education and communication must be regular and ongoing to overcome the transient nature of contractors and visiting staff members. The main signage aspects to consider are:

- general waste (garbage) and recycling bins and storage areas must be clearly and correctly labelled / indicated at all times;
- waste storage areas must have clear signage instructing cleaners and tenants how to correctly separate (if required);
- the location of, and directions to, waste storage areas must be well signposted;
- all hazards or potential dangers associated with the waste facilities should be clearly identified, especially those linked to compaction or other waste handling equipment; and
- emergency contact information should be displayed in case there are any issues with the waste and recycling systems/services in the building.

All signage should conform to the relevant Australian Standard and the NSW EPA's standard recycling signs. The design and use of safety signs for waste rooms and enclosures should comply with AS 1319 Safety signs for the occupational environment. Australian Standards are available from the SAI Global Limited website (www.saiglobal.com).

6.6 Communication Strategies

Waste management initiatives and management measures should be clearly communicated to building managers, owners, tenants and cleaners. Benefits of providing this communication include:

- improved satisfaction with services;
- increased ability and willingness to participate in recycling;
- improved amenity and safety;
- improved knowledge and awareness through standardisation of services;
- increased awareness or achievement of environmental goals and targets;
- reduced contamination of recyclables stream;
- increased recovery of recyclables and organics (where implemented) material; and
- greater contribution to state-wide targets for waste reduction and resource recovery.

To realise the above benefits, the following communication strategies should be considered:

- use consistent signage and colour coding throughout the development;
- ensure all staff are trained in correct waste separation and management procedures;
- provide directional signage to show location of and routes to waste storage areas;
- co-mingled and general waste bins should be clearly labelled to ensure no cross contamination;
- general garbage and co-mingled recycling bins should be colour-coded with clear labels identifying the type of waste that may be disposed of in each bin, where applicable;
- any employees / contractors should adhere to the WMP for compliance, in consultation with Management; and
- repair signs and labels promptly to avoid breakdown of communications.

All signage should conform to the relevant Australian Standard and the NSW EPA's standard recycling signs. The design and use of safety signs for waste rooms and enclosures should comply with AS 1319 Safety signs for the occupational environment. Australian Standards are available from the SAI Global Limited website (www.saiglobal.com).

6.7 Contract Clauses

Waste collection contracts and cleaning contracts should include clauses relating to waste servicing requirements. Lease agreements should also outline and enforce proper use of waste facilities.

Refer to Appendix H of the EPA's *Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities* (2012) for example clauses.

6.8 Monitoring and Reporting

Visual assessment of bins prior to collection should be undertaken by Management within the first few months of RACF rooms being occupied to ensure the waste management system is sufficient for the developments' needs, and on a half-yearly basis to ensure employees are disposing of waste and recycling correctly. Where visual audits show that recycling is not carried out effectively, signage should be re-examined.

6.9 Roles and Responsibilities

It should be the responsibility of Management to implement the WMP and a responsibility of the employees/building caretakers/cleaners to ensure that they comply with the guideline at all times.

Management should routinely check waste sorting and storage areas for cleanliness, hygiene and OH&S issues, and also ensure all monitoring and audit results are well documented and carried out as specified in the WMP.

An outline of waste management responsibilities are presented in Error! Reference source not found..

Table 13 Waste Management Responsibility Allocation

Responsible Person	General Tasks
Building Management	Ensure the WMP is implemented throughout the life of the operation.
	Update the WMP on a regular basis (e.g. annually) to ensure the Plan remains applicable.
	Undertake liaison and management of contractor collections.
	Perform a visual waste inspection of bin fullness once RACF rooms have been fully occupied.
	Manage any complaints and non-compliances reported through waste audits etc.
	Perform inspections of all waste storage areas on a regular basis for cleanliness.
	Organise cleaning and maintenance requirements for waste storage areas and bins as required.
	Ensure effective signage, communication and education is provided to alert new residents/cleaners about the provisions of this WMP.
	Monitor and maintain signage to ensure it remains clean, clear and applicable.
Cleaners / Caretaker / Employees	Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.
	Monitor bins to ensure no overfilling occurs.
	Ensure waste and recycling storage areas are kept tidy.
	Ensure segregation of clinical wastes from general waste and recycling.
Gardening Contractor	Transfer of bins to the waste storage area and collection point as required.
	Cleaning of all bins and waste and recycling area as required.
	Collection and removal (as applicable) of all garden organics generated during gardening maintenance activities for recycling or reuse as organic mulch on landscaped gardens.
	Removal of any large garden organics waste materials which are too large to be recycled via contractor collections (if applicable).

APPENDIX Q

Landscape Management Plan



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Western North South Link Road Landscape Management Plan

Prepared by: Scape Design Pty Ltd
Prepared for: Goodman Property Services



Revision Schedule

Revision	Date	Issued by
01	12/06/19	HW & CH
02	25/06/19	MF & CH
03	17/07/19	HW & CH
04	12/08/19	HW & CH
05	20/09/19	MF & CH
06	04/10/19	MF & CH
07	31/10/19	MF & CH
08	14/11/19	MF & CH

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2 CONDITIONS

2.1 TABLE OF CONDITIONS

Visual Amenity			
Condition No.		Condition	Action
D35. Prior to the commencement of construction of Stage 1, the Applicant must prepare a Landscape Management Plan (LMP), to the satisfaction of the Planning Secretary. The plan must form part of the CEMP in accordance with Condition D119 and the OEMP in accordance with Condition D130 and must:	(a)	<i>be prepared in consultation with Council</i>	Refer to Section 3.1.4 for Council Consultation
	(b)	<i>detail procedures for the retention of existing native vegetation in the north-western corner of the Site and protection of this vegetation from construction impacts</i>	Refer to Western North South Link Road - Flora and Fauna Management Plan Refer to Section 4.3.1 of this LMP for species specific vegetation management.
	(c)	<i>include visual impact mitigation measures for construction including but not limited to:</i> <i>(i) the location of site sheds, compounds and machinery parking areas, avoiding the western and southern side boundaries, or other locations highly visible from adjacent residential properties.</i> <i>(ii) procedures for progressive grassing of exposed soil, as soon as reasonably practicable after disturbance, focusing on the areas where building construction will occur at a later stage</i>	(i) Refer to Construction Environmental Management Plan and Section 4.3.2 for location of construction facilities operations. (ii) Refer to Section 4.3.2 of this LMP for procedures of progressive grassing techniques.
	(d)	<i>detail the works required to construct the landscape bund along the western boundary of the Site, as shown on Figure 5 in Appendix 2, including provision for the landscaping to incorporate mature tree (no less than 75 litre pot size)</i>	N/A - Bund Works are only relevant to Oakdale West Estate (OWE) – Refer OWE LMP
	(e)	<i>include a schedule of works which prioritises the construction of the landscape bund along the western boundary of the Site, as shown on Figure 5 in Appendix 2.</i>	N/A - Bund Works are only relevant to Oakdale West Estate (OWE) – Refer OWE LMP

	(f)	<i>include a program for implementing the landscape bund as soon as reasonably practicable, and no later than prior to operation of Stage 1.</i>	N/A - Bund Works are only relevant to Oakdale West Estate (OWE) – Refer OWE LMP
	(g)	<i>describe the integration of landscaping with fixed elements, including retaining walls and noise walls</i>	Refer to Section 4.3.3 of this LMP
	(h)	<i>describe the monitoring and maintenance procedures to ensure the success of the landscaping works over the life of the Development.</i>	Refer to Section 5 of this LMP
D36. The applicant must:	(a)	<i>not commence construction of Stage 1 until the LMP is approved by the Planning Secretary</i>	N/A
	(b)	<i>must implement the most recent version of the LMP approved by the Planning Secretary</i>	Noted
	(c)	<i>include the monitoring and maintenance procedures contained in the LMP within the OEMP required in accordance with Condition D130</i>	N/A
Landscaping			
D37. The Applicant must complete the landscape bund along the western boundary of the Site as shown on Figure 5 in Appendix 2 within six months of commencing any construction including bulk earthworks.	-	-	N/A - Bund Works are only relevant to Oakdale West Estate (OWE) – Refer OWE LMP

D38. The Applicant must maintain all landscaping implemented as part of Stage 1, as shown on Figure 5 in Appendix 2, for the duration of the Development. If the monitoring carried out as part of Condition D35 indicates that any aspect of the landscaping has not been successful, the Applicant must undertake re-planting and rehabilitation works, as soon as reasonably practicable.	-	-	<p>Refer to Section 5 of this LMP for maintenance requirements.</p> <p>Refer to Section 5.3.1 of this LMP for requirements of unsuccessful planting</p>
Management Plan Requirements			
D118. Management plans required under this must be prepared in accordance with relevant guidelines, and include:	(a)	<p>details of:</p> <ul style="list-style-type: none"> (i) the relevant statutory requirements (including any relevant approval, license or lease conditions) (ii) any relevant limits or performance measures and criteria (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures 	<p>(i, ii) In relation to landscape softworks, the following Australian Standards are applicable and have guided all landscape works: AS 4419-1998 Soils for landscaping and garden use, AS 4970-2009 Protection of existing trees on development sites (where not covered by council requirements) and AS 2303-2015 Tree stock for landscape use.</p> <p>(iii) Refer to this LMP for more information.</p>
	(b)	a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria	All landscape works have been designed using relevant Australian Standards as a guiding point. Refer to this LMP for more information.
	(c)	<p>a program to monitor and report on the:</p> <ul style="list-style-type: none"> (i) impacts and environmental performance of Stage 1 (ii) effectiveness of the management measures set 	<p>(i) Refer to Section 6 of this LMP for maintenance and monitoring schedule</p> <p>(ii) Refer to Section 6 of this LMP for maintenance and monitoring schedule</p>

		<i>out pursuant to paragraph (b) above</i>	
	(d)	<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>	Refer to Section 6.5 of this LMP for the contingency management plan
	(e)	<i>a program to investigate and implement ways to improve the environmental performance of Stage 1 over time</i>	Refer to Section 5.3 and Section 6 of this LMP for maintenance and monitoring requirements and schedules
	(f)	<i>a protocol for managing and reporting any:</i> <ul style="list-style-type: none"> <i>(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria)</i> <i>(ii) complaint</i> <i>(iii) failure to comply with statutory requirements</i> 	Completed in CEMP
	(g)	<i>a protocol for periodic review of the plan</i>	Completed in CEMP

3 INTRODUCTION

3.1 GENERAL

3.1.1 GENERAL CONDITIONS

Contract: Western North South Link Road

Local Council(s): Penrith City Council

3.1.2 DRAWING REFERENCE

All landscape plans, details and specifications included in the project documents should be read in conjunction with the Landscape Management Plan. All structural and civil works components of the landscape design should be referenced to engineers' details and specifications. Read the Landscape Management Plan in conjunction with these packages. If in doubt about any details or if conflicts are found in the documents, seek advice.

3.1.3 WORKMANSHIP AND MATERIALS

All landscape works must be carried out by a competent, trained and qualified contractor who is experienced in horticultural practices, landscape construction and planting techniques. The contractor must hold a current Building Contractors License and/or be a financial member of LNA Landscape Association NSW & ACT or equivalent organisations in other states.

3.1.4 COUNCIL CONSULTATION

Queries and consultation with Penrith City Council (PCC) have been resolved as per the table below:
Refer to Section 7.1 - Appendices for original email correspondence.

Query	Penrith City Council (PCC) Advice	Action
Date – 29/10/2018		
1. Along the new road, the concept design indicates clustered planting of native trees with native groundcover, in beds. These beds are spaced fairly evenly along the road verge and are separated from turf with concrete flush kerb. The tree species is <i>Corymbia maculata</i> (spaced min 600 from kerb) and ground cover species is <i>Myoporum parvifolium</i>. <i>Corymbia</i> are used in this fashion elsewhere in the precinct (Penrith LGA) and the client is keen to maintain this language on the streetscape. Are the species, particularly the tree species acceptable to council?	<i>Council does have concerns about <i>Corymbia maculata</i> on the road verges. Around ten years ago, a storm came through Jamisontown and <i>Corymbia maculatas</i> came down with Harris St and McNaughton St being the hardest hit. Following that storm Council went through a program of removing the <i>maculatas</i>. They lifted gutters and roads causing a lot of damage. A lot of the works on the trees needed to be done by contractors because they exceeded the limit of our cherry picker. A smaller tree that can handle clay soils and the extreme heat of Western Sydney may be a better option.</i>	<i>Corymbia maculata</i> replaced with <i>Callistemon viminalis</i>

<p>2. What is council's preferred species of turf for verges? Currently we have specified Zoysia as this is in line with RMS preferences, however the concept plan specifies Couch.</p>	<p>The WNSLR is expected to be a State Road, therefore the turfing is to be in line with RMS preferences/requirements.</p> <p>Note: See 9.1.6 of Council's Construction Specification for Council's requirements. Council will not support the use of Kikuyu grass in any road, drainage or landscaping works adjacent to sensitive areas including national parks and reserves, other bushland area and water ways.</p>	<p>All turfing to be Zoysia 'Nara' Empire and adheres to Specification 9.1.6 of PCC's construction specification.</p>
<p>3. The medians will be planted where width and sightlines permit. At the ends of medians a low groundcover Scaevola is proposed. It has proven to be hardy in other nearby areas.</p> <p>Generally, along planted medians Lomandra 'Veryday' (similar to 'Tanika' is proposed. Is this approach acceptable to council?</p>	<p>A mix of Scaevola with Rhagodia might be better than a monoculture.</p>	<p>Median planting to include: Phormium cookianum Rhagodia spinescens Scaevola albida 'Blue Mist' as per Council instruction to avoid monoculture of Lomandra</p>
<p>4. Roadside batters between the verge and road corridor boundary are proposed to be revegetated using RMS specified techniques. The treatment type is proposed to be hydro seeding over ameliorated site topsoil on prepared batters.</p> <p>The species mix will comprise</p> <ul style="list-style-type: none"> (a) native grasses (b) couch (to ensure a mixture of long term 'pasture' like coverage, in keeping with the general area) (c) cover crop (for initial stabilization and provision of organic matter following the initial growing season). <p>Does council approve this approach and species?</p>	<p>The WNSLR is expected to be a State Road, therefore the roadside batters are to be in line with RMS specified techniques.</p>	<p>All roadside batters drawn and specified in line with RMS techniques.</p>

3.2 DESCRIPTION

3.2.1 SITE LOCATION

The Western North South Link Road is located in the Penrith Local Government Area (LGA) at the far south-western extent of the WSEA. The site is bound to the north by the Water NSW Pipeline and to the east by the Ropes Creek riparian corridor. Land along the eastern boundary of the site is also affected by a transmission easement associated with TransGrid infrastructure.

3.2.2 PURPOSE OF LANDSCAPE MANAGEMENT PLAN

This Landscape Management Plan (LMP) has been developed as per the Development Consent for the Western North South Link Road works specifically.

4 SITE MANAGEMENT

4.1 ENVIRONMENTAL ASPECTS

4.1.1 DESCRIPTION

The Landscape Management plan seeks to manage potential visual impacts as a result of operational activities that may affect local and regional visual receptors. These impacts need to be managed to minimise impacts to sensitive visual receptors, and satisfy the conditions of the DA.

4.2 OBJECTIVES

4.2.1 OBJECTIVES

The objectives of this LMP include:

- *ensuring that the conditions of the DA and Goodman Landscape standards are met*
- *managing the visual impacts of the project to comply with the landscape performance criteria*
- *ensuring the visual and landscape treatments are consistent with the ecological revegetation works described in the Western North South Link Road – Flora & Fauna Management Plan*

4.3 MANAGEMENT ACTIONS

4.3.1 RETENTION OF EXISTING ENVIRONMENT

Existing vegetation retention

Procedures detailing how existing native vegetation in the north western corner of the Site will be protected from construction impacts are provided for in the “Western North South Link Road - Flora and Fauna Management Plan” (écologique, June 2019).

Generally, clearly marked and identified No-Go zones are to be established with star pickets and parawebbing, with site-wide vegetation clearing minimised where possible. Trees that are to be retained are to have a 2x dripline exclusion zone where no motor vehicles are to be operated. Compaction of soil and trampling of tree roots by machinery may lead to the damage and death of retained trees and should be avoided. All site offices, compounds and stockpile areas are to be located within the limits of clearing or otherwise away from No-Go zones. Construction vehicle movements are to be restricted to the haul road network or previously disturbed areas, and should not enter into retained vegetation areas beyond the approved impact areas. At no point is cleared vegetation to be bulldozed into adjacent bushland retained beyond the limits of clearing. These areas will be under the supervision of the project ecologist.

Trees to be Retained and Protected

Refer to *Western North South Link Road - Flora and Fauna Management Plan* for information and requirements relating to existing trees to be protected.

Tree protection measures must be in accordance with Australian Standard AS4970-2009 Protection of trees on development sites.

Any "Site works" including the demolition of existing structures or the entrance onto the site with any machinery for excavation, demolition or large-scale rubbish removal requires protection measures to be installed. These protection measures must be installed prior to the commencement of any site work in accordance with Australian Standard AS4970-2009 Protection of trees on development sites.

- *Identify and mark trees and shrubs to be retained using a suitable non-injurious, easily visible and removable means of identification.*
- *Protect from damage the trees and shrubs to be retained, including those beyond the site area, both above and below the ground.*
- *If a tree becomes damaged during the works or it is proposed to perform work on a tree, give written notice immediately and obtain instructions.*
- *Keep the area of the drip-line free from construction material and debris. Do not place bulk materials and harmful materials under or near trees.*
- *Do not place spoil from excavations against tree trunks.*
- *Prevent wind-blown materials such as cement from harming trees and plants.*
- *Do not remove topsoil from, or add topsoil to, the area within the drip-line of trees.*

Where existing vegetation is to be retained, that vegetation must be protected from soil compaction, root, trunk and limb damage, soil contamination and changes in surface levels that affect the health of the vegetation.

4.3.2 TEMPORARY LANDSCAPE MANAGEMENT

Site compound access must be suitable in all weather conditions. Therefore, the main site compound is located just south of Lockwood Road, with secondary compounds located South of the Water NSW Pipeline and close to Bakers Lane. This compound will be in place until the access road is completed, and then the compound will be relocated further north.

The compound areas are identified below:





Site compounds along the southern site boundary have been offset by 40m to ensure minimal visual impact.



Image 1 – Proposed Compound Location: Taken at the nominated bulk earthworks level looking towards Sensitive Receiver 2 and 3. Existing trees provide visual amenity to the proposed compound location.



Image 2 – Proposed Compound Location: Taken at the nominated bulk earthworks level looking towards sensitive receiver 1. Existing trees provide visual amenity to the proposed compound location.



Image 3 – Proposed Compound Location: Taken at the nominated bulk earthworks level looking towards sensitive receiver 1. Existing trees provide visual amenity to the proposed compound location.



Image 4 – Proposed Compound Location: Taken at the nominated bulk earthworks level looking towards sensitive receiver 1. Existing trees provide visual amenity to the proposed compound location.



Image 5 – Proposed Compound Location: Taken at the nominated bulk earthworks level looking towards sensitive receiver 1. Existing trees provide visual amenity to the proposed compound location.



Image 6 – Proposed Compound Location: Taken from proposed compound location towards Western Boundary. Existing levels are currently higher than the proposed pad bulk level. Landscape Bund to provide visual amenity and reduce the visual impact of works adjacent to school. Further detail of the Landscape Bund is located in the **OWE – LMP**.

As part of the Soil and Water Management measures implemented by Robson, the topsoil that is stripped from the site will be stockpiled adjacent in berms adjacent to the tops/toes of batters. Once the earthworks batters in both cut and fill situations are complete, the topsoil will be placed back on these batters and revegetated as required.

Landscape management actions to mitigate the construction of site sheds, compounds, and machinery parking areas fall into a temporary landscape treatment. The procedures for these treatments require progressive grassing on exposed soils following construction (after disturbance).

Progressive grassing involves seeding, which must be carried out within 2 days of completion of soil preparation, or in the case of inadequate weather conditions, as soon as reasonably practicable after preparation of earthworks. Seed mixture is to be agitated continuously during application, where it is to be applied uniformly over the whole surface. A minimum thickness must be achieved to ensure successful seed germination and growth. Further detail of progressive grassing techniques can be found within the **Landscape Specification and Drawings Packages**.

Refer to Detail 03-01-03 – L.CD.203 for pasture grass revegetation.

Refer to Section 7.2 and 7.3 in Appendices for relevant **Landscape Specification and Drawings**.

4.3.3 PERMANENT LANDSCAPE MANAGEMENT

Integration of landscaping with fixed elements

The Integration of fixed elements and the landscape within the Western North South Link Road includes elements such as:

Bio Basin No.1

Bio Basin is to be entirely vegetated with **PM5** 'Basin Planting' **refer to Landscape detail 03-02-10 on L.CD.203** for further details.

Drainage Swales

All drainage swales are to be vegetated with reinforced turfing (jute net & pins) **refer Landscape detail 03-02-19 on L.CD.203** for further details.

Drainage Culverts

All drainage culverts are to be finished as per the CIVIL ENG. Drawings. When drainage culverts are located within roundabouts **refer to Landscape detail 03-02-23 on L.CD.203** for further details and monitor maintenance requirements at the interface of all drainage culverts & gutters (Section 5 of this LMP).

Fencing & Gates

All fencing and gates are to be finished as per the CIVIL ENG. Drawings. Monitor Maintenance requirements of lawn care with interface elements (Section 5 of this LMP).

Maintenance Tracks

Typically, the maintenance tracks around the Bio Basin are to be revegetated with **RM1B** on the cut batter of the Northern and Eastern side of the track and Turfing or Basin planting on the southern and western side of the track. **Refer to Landscape Drawings L.CD.105 & L.CD.106 and Landscape details 01-05-01, 03-01-03 & 03-02-10 on L.CD.203** for further details

Planted Medians and Verges (Excluding Turfing)

Where road medians and verges are to be planted, **250mm of mulch only** is to be included next to the kerb. **Refer to Landscape Drawings L.CD.201-203**

Retaining Walls

Retaining walls and balustrading are to be finished as per CIVIL ENG. Drawings. **Refer to Landscape Drawing L.CD.202** for adjacent landscape treatments.

Roundabouts

The Western North South Link Road roundabout is inclusive of a number of unique landscape treatments including, sandstone blocks, charcoal ballast rock and low maintenance landscape planting mix **PM4A**. **Refer to drawing L.CD.104** and **Landscape details 03-02-23 and 03-01-23 on L.CD.203** for further details.

Steel Pipe Fauna Crossing

The steel pipe fauna crossing is to include localised tree planting, felled timber logs and mulching at the entry and exit points. **Refer to drawing L.CD.103**

Refer to Section 7.2 in Appendices for relevant landscape drawings.

5 VISUAL AND LANDSCAPE TREATMENTS
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5.1 GENERAL

5.1.1 QUALITY

This section of the Landscape Management Plan describes the procedures to ensure the success of the landscaping work over the life of the development.

All landscaped areas must be maintained to the approval of the principal and landscape architect.

5.1.2 APPROACH

A proactive approach to all landscape tasks must be adopted to ensure that the appearance of the landscape as a whole is highly presentable at all times.

5.1.3 REQUIREMENTS

Contractors must submit annual routine landscape maintenance program to the Project Superintendent, Landscape Manager and/or the Landscape Architect within two weeks of the contract commencement date.

It is the contractor's responsibility to ensure the success of the landscaping work over the establishment period of the development.

5.2 MAINTENANCE PROGRAMS

5.2.1 GENERAL CONDITIONS

The Contractor shall rectify all defects during installation that become apparent in the works during the defect's liability period **(18 months)**.

The Contractor shall maintain the contract areas by the implementation of industry accepted horticultural practices between the date of practical completion and the date of final completion **(18 months)**.

The landscape maintenance works shall include, but not be limited to the following:

- *Replacing failed plants*
- *Pruning*
- *Herbicides/Insect and pest control*
- *Fertilizing*
- *Maintaining mulch*
- *Mowing*
- *Watering/Irrigation*
- *Weeding*
- *Rubbish removal; and Cleaning of the surrounding areas.*
- *Timber stakes and ties*

Ongoing maintenance: Ongoing maintenance facilitated by the Owner's corporation.

Safety: Safety procedures/ plans are to be documented for review by Principal prior to commencement of work.

Failure to maintain the landscape planting in a healthy condition may result in the Principal arranging for the maintenance work to be carried out by others at your expense.

5.2.2 AREAS DEFINED IN LANDSCAPE MAINTENANCE PLAN

Hard and Soft Landscape works to be maintained throughout the maintenance program includes all landscape areas including street trees.

5.2.3 PROTECTION OF PERSONS AND PROPERTY

Temporary works: Provide and maintain required barricades, guards, fencing, shoring, temporary roadways, footpaths, signs, lighting, watching and traffic flagging.

Accessways, services: Do not obstruct or damage roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Determine the location of such services.

Property: Do not interfere with or damage property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees.

5.2.4 RECTIFICATION

Accessways, services: Rectify immediately any obstruction or damage to roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Provide temporary services whilst repairs are carried out.

Property: Rectify immediately any interference or damage to property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees.

5.2.5 EXISTING SERVICES

General: Attend to existing services as follows:

- *If the service is to be continued, repair, divert or relocate. Submit proposals.*
- *If the service crosses the line of a required trench, or will lose support when the trench is excavated, provide permanent support for the existing service. Submit proposals.*
- *If the service is to be abandoned, remove redundant parts, and make safe.*

Proposals: Submit proposals for action to be taken with respect to existing services before starting this work. Minimise the number and duration of interruptions.

5.2.6 ACCESS FOR MAINTENANCE

Requirement: Provide access for maintenance of plants and equipment.

Standards: Conform to the relevant requirements of AS 1470, AS 1657, AS/NZS 1892.1, AS 2865 and AS/NZS 3666.1.

Work Health and Safety: Conform to the requirements of the applicable Work Health and Safety regulations for all temporary and permanent works.

Protection from injury: Protect personnel from injury caused by contact with objects including those that are sharp or protrude at low level.

5.2.7 LOGBOOK

Ensure a Maintenance Logbook is recorded to demonstrate that maintenance work has been undertaken and what materials, including chemical materials, have been used throughout the maintenance and establishment period.

The logbook must include the date of visit, maintenance works completed, maintenance works in progress and maintenance works required. The logbook must give details of damaged, dead or missing plants and show their locations on the relevant sheets of the Drawings.

Use the logbook to identify chemicals used as well as the reason for their use. Submit the initial logbook for inspection prior to Practical Completion and again at the end of the Defects Liability Period as a prerequisite for granting Practical and Final Completion Certificates.

Record all major events and activities in the logbook. Ensure the logbook is available for inspection on request.

5.3 MAINTENANCE WORKS ---

5.3.1 PLANT CARE

Planting: Ensure the general appearance and presentation of the landscape and the quality of plant material at date of practical completion is maintained for the full planting establishment period. Trees, shrubs and groundcovers shall at all times display healthy growth. Spent flower heads or stalks shall be removed immediately following flowering.

All shrubs, hedges, ground covers and trees must be trimmed into shape as required to an acceptable presentation standard.

Excessive foliage impacting onto roads, paths, fencing and lighting must be pruned during all site visits. Leaf litter and or all cuttings should be removed from all gardens and site each visit and disposed of at contractor's cost. Any dead or dying plants/shrubs should be removed and replaced with same or comparable species. The Landscape Manager must be consulted when large trees need to be removed and or replaced. The contractor will maintain each plant in a healthy condition to increase the visual appeal of the gardens.

Replacements: Replace failed, dead and/or damaged plants at maximum 3-week intervals as necessary throughout the full plant establishment period. Replacement plants shall be in a similar size and quality and identical species or variety to the plant that has failed. Replacement of plants shall be at the cost of the Contractor unless advised otherwise. If the cause of the failure is due to a controllable situation then correct the situation prior to replacing plants.

Keep all planting areas as specified and free of grass and weed.

Carry out grass and weed removal at intervals of not more than four (4) weeks and ensure that weeds do not flower to form seed heads.

For those species listed by the relevant local government authority as noxious under the [Biosecurity Act 2015](#) take action as required by that local Government Authority (Penrith City Council). [Refer to](#)

Section 4.3 of the Flora and Fauna Management Plan (FFMP) for further information regarding Weed Management and Mitigation Measures.

5.3.2 PRUNING

General: Prune to the Pruning schedule and AS 4373.

Any pruning requested by the Landscape Architect shall be performed, including any pruning of damaged growth or miscellaneous pruning considered as beneficial to the condition of the plants. All pruning works shall be undertaken in a manner equal to acceptable horticultural practice.

Pruning to ensure pathways, roads, lighting and services such as fire hydrants, overhead services and signs are kept clear from encroaching growth of plant material at all times.

- *Remove all damaged, dead or diseased wood by pruning to the nearest lateral shoot or active bud with a neat clean cut*
- *No more than 40mm - 50mm of new growth present on hedges at any time*
- *Remove all spent or dead flower heads from plants following flowering*
- *Prune young shrubs for shape by pinching out the growing tips to encourage lateral bushy growth*
- *Hedging shall be carried out to appropriate plants within garden beds. This should be carried out on a regular basis so as to avoid cutting back into 'old wood' in order to achieve the desired form.*
- *All existing hedges on site to be maintained*
- *Removal of suckers from base of trunks*
- *Formative pruning of trees to allow effective canopy development and retain natural or desired shape of the tree*
- *Pruning cuts shall be made and close to the bud at a 45° angle to ensure that any water is shed away from the bud*

5.3.3 SPRAYING

Responsibility for insect and disease control: Contractor

Period of treatment: Until the problem has been eliminated.

Chemical spray: Apply outside of normal working hours.

Avoid spraying:

- *whenever possible*
- *in the case of wet weather*
- *if wet weather is imminent*
- *if target plants are still wet after rain*
- *during windy weather*
- *if adjacent desirable species are too close to the target plants to be avoided.*

Do not spray where herbicide could fall into a watercourse or when wind conditions could cause drift outside the area to be treated or onto desirable plants.

After spraying, lop any dead weeds flush with the ground surface and dispose of the cuttings.

Remove by hand any weeds which cannot be controlled by herbicide. Ensure that the entire weed including all roots is removed. Dispose of the weeds off site.

Immediately report to the Project superintendent/landscape manager any evidence of intensive weed infestation, insect attack or disease amongst plant material. Submit all proposals to apply chemicals and obtain approval before starting this work.

When approved, spray with herbicide, insecticide, fungicide as appropriate in accordance with the manufacturers' recommendations. Record in the logbook all relevant details of spraying activities including:

- *Product brand / manufacturer's name*
- *Chemical / product name*
- *Chemical contents*
- *Application quantity and rate*
- *Date of application and location*
- *Results of application*

5.3.4 FERTILISING

Soil tests: Take samples from planting beds areas and conduct tests.

Fertilising: Base the fertilisation program on the soil testing results. Fertilise trees once every two years. Generally, apply an all-purpose fertiliser of N:P: K (nitrogen: phosphorus: potassium) 10:4:6 at recommended rates. Alternatively apply 12-month slow release fertiliser (such as Nutricote) at the manufacturer's recommended rate. Apply all-purpose fertiliser to shrubs annually in two bands and cultivated into the soil 100 mm deep.

Record in the logbook all relevant details of fertilizing including:

- *Product brand / manufacturer's name*
- *Fertilizer / product name*
- *Application quantity and rate*
- *Date of Application and Location*

5.3.5 STAKES, TIES, TREEGUARDS AND ROOT BARRIERS

Stakes

Generally: If plants are unable to be self-supported or if stakes are damaged, stake or restake the plants

Material: Hardwood, straight, free from knots or twists, pointed at one end.

Installation: Drive stakes into the ground at least one third of their length, avoiding damage to the root system.

Stake sizes and quantities:

- *For plants ≥ 2.5 m high: Three 50 x 50 x 2400 mm stakes per plant.*
- *For plants 1 to 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant.*
- *For plants < 1 m high: One 38 x 38 x 1200 mm stake per plant.*

Ties

General: Provide ties fixed securely to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant. Attach ties loosely so as not to restrict plant growth.

Tie types:

- *For plants ≥ 2.5 m high: Two strands of 2.5 mm galvanized wire neatly twisted together, passed through reinforced rubber or plastic hose, and installed around stake and stem in a figure eight pattern.*
- *For plants < 2.5 m high: 50 mm hessian webbing stapled to the stake.*

Marker stakes

Material: Timber offcuts 25 x 25 x 1200 mm. Dip the top 200 mm in white paint.

Installation: Drive firmly into the ground at least 300 mm from the plant. Do not tie to the plant.

Location of marker stakes:

- *Trees in grass: Mark each tree.*
- *Rip line planting areas: Mark each rip line at every fifth plant along the line.*

Trunk protection/Tree guards

Collar guards: 200 mm length of 100 mm diameter agricultural pipe split lengthways.

Removal: If plants are robust with well-developed systems and are strong enough to no longer require support, remove stakes and ties at the end of the planting establishment period (Defects Liability Period).

- *Adjust and replace as required to ensure plants remain correctly staked.*
- *Repair any tree ties that have been broken and replace any missing stakes.*
- *Maintain the tree guards around each plant so that the natural plant growth is not impeded or restricted. Replace damaged and missing tree guards as soon as practicable after being identified.*
- *Remove tree guards progressively as plants mature and where it is deemed that the tree guard provides no further benefit to the establishment of the plant.*

Root Barriers

Type/ location: Street Trees **Refer Detail 08-02-22 on L.CD.203** City Green 'ReRoot' 600mm Depth

Supplier: City Green. Ph: +61 1300 066 949

<https://citygreen.com/products/reroot/>

5.3.6 MULCHED SURFACES

The contractor is required to maintain all areas of mulch cover within garden beds. Displaced mulch should be returned to the garden beds wherever possible. All areas of mulch cover must be packed to a depth of 75mm. If replacement of mulch is required, the contractor must notify the Landscape Manager and provide quotation for approval. Specific mulch must be approved prior to installation.

5.3.7 HYDROMULCHING

General: Maintain temporary and permanent grassing areas.

Weeding: Remove weeds that emerge in newly established hydroseeded/hydromulched areas.

Reseeding: Repair topsoil, supplementing if necessary, to achieve design surface levels. Reseed over the course of the contract to maintain required densities and repair bare patches.

Watering: Until germination, keep the surface damp and the topsoil moist but not waterlogged.

After germination: Water to maintain a healthy condition, progressively hardened off to the ambient climatic conditions

5.3.8 MOWING AND TOPDRESSING

Mow and edge all turf areas and remove all grass clippings. Do not mow if there is litter, roadside rubbish and debris left on the turf as the litter may be transformed into confetti-like pieces after mowing.

Unless directed otherwise, the cut grass height must not be less than 35 mm or greater than 75 mm. Do not remove more than 50% of the height of the uncut grass at any one time. The upper limit may be varied to account for terrain, species of grass and presence of debris.

Clippings may remain where they fall, except for those that fall on road surfaces, line drains, footways or paved areas where they must be swept clear.

Lawn care

Lawn areas, including nature strips must be neatly mown and edged weekly in the high season (summer months), fortnightly in the low season (winter months), or weekly if required due to abnormal weather condition. All clippings must be removed from the site. All lawns must be fertilized once a year with an approved lawn fertilizer.

Interface Issues

Where landscape treatments requiring lawn care interface fixed elements such as signage, fencing and walling ensure optimal care to avoid damaging the fixed element.

5.3.9 IRRIGATION & WATERING

Maintain the irrigation system to ensure that each individual plant receives the required amount of water to maintain healthy growth, adjust and rectify as required.

Provide additional hand watering, if irrigation system fails or is yet to be installed.

Undertake watering at two-day intervals for four weeks after completion of each planting area.

The irrigation system must be fully functional at all times to ensure that all plants, trees and lawns receive adequate water at optimal frequency. The system should be tested during each site visit to ensure proper operation timing is set correctly. Adjustments must be made where necessary.

It is the contractor's responsibility to submit a bi-monthly report throughout the defect's liability period. This report should include a comprehensive report on the operational function of the system.

Notification as to when the system is in need of major repair must be done so immediately as the cost of major repairs to the system can be claimed as variation to the contract price and should be invoiced separately.

When water restrictions prevent the use of the irrigation system, arrangements must be made by the contractor to provide an alternative system of watering. Under no circumstances should plant stock be allowed to perish through lack of water.

Locations of water supply points have been marked indicatively on Landscape Drawings; all irrigation supply conduits are subject to Sydney Water Approval.

5.3.10 EROSION CONTROL MEASURES

Where necessary, maintain the erosion control devices in a tidy and weed free condition and reinstate as necessary to ensure control measures are effective where deemed necessary. [Refer to the Erosion and Sediment Control Plan for erosion control measures.](#)

5.3.11 FINAL CLEANING

Lamp and filter replacement and the like are dealt with in the various SERVICES worksections.

General: Before practical completion, clean throughout, including interior and exterior surfaces exposed to view. Clean debris from the site, roofs, gutters, downpipes and drainage systems. Remove waste and surplus materials.

The contractor shall target weeds that are capable of producing a major infestation of unwanted plants by seed distribution. Whenever possible, time weed removal to precede flowering and seed set.

Samples: Remove non-incorporated samples, prototypes and sample panels.

5.3.12 REINSTATEMENT

General: Before practical completion, clean and repair damage caused by installation or use of temporary work and restore existing facilities used during construction to original condition.

5.3.13 ADJOINING PROPERTY

Evaluation: At practical completion, for properties described in the Adjoining properties to be Recorded schedule inspect the properties with the project superintendent, recording any damage that has occurred since the pre-commencement inspection.

5.3.14 REMOVAL OF PLANT

General: Within 10 working days after practical completion, remove temporary works and construction plant no longer required. Remove the balance before the end of the defect's liability period.

5.3.15 URGENT WORKS

Not with standing anything to the contrary in the Contract, the Project Superintendent may instruct the Contractor to perform urgent maintenance works that place the completed contract works at risk.

If the Contractor fails to carry out the work within seven (7) days of such notice, the Project Superintendent (or representative) reserves the right without further notice to employ others to carry out such urgent and specified work and charge the cost to the Contractor. Such work shall include but not limited to the inspection and clearing of drains in the pavement and gardens.

5.4 COMPLETION

A final inspection shall be made by the Project Superintendent, Contractor and Landscape Architect before the completion of the Plant Establishment Maintenance Period (Defects Liability Period).

Any items requiring rectification shall be repaired before completion of the relevant works and finally approved prior to certification.

Maintenance requirements should extend for a minimum of 18 months after the completion of works (i.e. Practical Completion or PC). Prior to handover, the contractor(s) is/are required to submit all maintenance records, progress reports and a final monitoring report. The final monitoring report shall provide a summary of all works undertaken during the plant establishment period.

6 MAINTENANCE SCHEDULES

The following Maintenance Schedule is only applicable to the 'Defects Liability Period' and/or 'Establishment Period'.

6.1 MAINTENANCE REPORT SCHEDULE

General

Landscape Maintenance Schedule, Landscape Maintenance Procedure Schedule and Landscape Specification are to be read in conjunction with one another

Task	Activity	Frequency						Action
		D	W	F	M	3-6M	Y	
1	Logbook				x		x	<p>Complete a logbook entry when at site and at a minimum every two weeks.</p> <p>Upon request, make the logbook available for inspection. Submit copies of new entries in the logbook to the Contract Administrator on a monthly basis.</p> <p>Maintenance requirements should extend for a minimum of 1 year after the completion of works or until such time as a minimum 80% survival rate for all plantings and a maximum five percent (5%) weed cover for the treated riparian corridors, basins and verge/median planting is achieved.</p>
2	Planting and Replacement			x	x			<p>Inspect planting every 2 weeks and remove spent flowers and dead stalks as they become apparent.</p> <p>Inspect and replace failed plants within 2 weeks of observation of failure. Match species with original planted sizes and location of new with old.</p>
3	Pruning			x				<p>Inspect every 2 weeks and prune as necessary to remove dead wood.</p> <p>Pruning should Improve plant shape and promote healthy new growth.</p>

4	Spraying			x				Inspect every 2 weeks and action as necessary. Do not spray if other nonchemical methods will satisfy the need to remove pests. Spray for disease control only when absolutely necessary.
5	Fertilising					x		Fertilise gardens every 3 months or in accordance with fertiliser manufacturer's directions.
6	Stakes and Ties			x			x	Inspect every 2 weeks, adjust and/or replace as necessary but remove as plants mature and are able to support themselves.
7	Mulching			x			x	Inspect and replace mulch deficiencies within 2 weeks of observation. Prior to placing new mulch aerate the soil by fork turning to a depth of at least 100mm, roughly level the soil and then place mulch. Do not disturb major plant roots while aerating soil. It can be expected that mulch will have significantly broken-down after an estimated 12-month period following initial application. It is therefore, recommended that all mulch beds are topped-up with a 50mm layer of woodchip/leaf mulch (Compliant with AS 4454) at this stage. This should be accompanied by a topdressing application of a 9-month, slow release, low phosphorous fertilizer to ensure that semi-established plantings do not suffer as a result of potential nitrogen draw-down that may be associated with the application of the 50mm mulch layer at yearly period.
8	Hydroseeding		x		x		x	Remove weeds monthly that emerge in newly established hydroseeded/hydromulched areas. Reseed monthly over the course of the contract to maintain required densities.

								Water until germination, keep the surface damp and the topsoil moist but not waterlogged. After germination: Water to maintain a healthy condition, progressively hardened off to the ambient climatic conditions
9	Mowing and Topdressing			x	x	x		Summer fortnightly. Winter monthly. Top-dress 6 monthly.
10	Irrigation and Watering	x		x				Water when and where necessary every day at site and at least every 2 weeks generally. Do not allow soil and plants to dehydrate. Allow for prolonged rain, windy and dry periods. Water in the early morning or late afternoon to avoid excessive evaporation during the heat of the day.
11	Erosion Control Measures							Refer to the Erosion and Sediment Control Plan for erosion control measures.
12	Final Cleaning		x				x	Inspect and remove litter immediately upon observation. Leave no waste on site. Dispose of waste material at a designated waste disposal site. All herbaceous weeds should be managed to be at very-low percentage cover levels, (as a minimum), or better. Pasture grasses should be prevented from spreading into any bushland zones by applying a spot glyphosate herbicide spray application on the 1-metre wide buffer zone, on a monthly basis or as required. Maintenance weeding for a period of 12 months after the completion of primary works with an increase in maintenance hours occurring throughout the warmer growing months.
13	Urgent Works		x					Complete within 1 week (7 days) of notification. Inspect and clear drains as required.

* Key: D – Daily, W – Weekly, F – Fortnightly, M – Monthly, 3-6M – Quarterly or Half Yearly, Y – Yearly

6.2 MAINTENANCE PROCEDURE SCHEDULE

Maintenance Scope of Works

The Maintenance procedure schedule should be used as a check list of tasks when in attendance

Week	Spring (Sep, Oct, Nov)	Summer (Dec, Jan, Feb)	Autumn (Mar, April, May)	Winter (June, July, Aug)
1	Mow and trim lawns	Mow lawns, weed	Mow Lawns	Weed
2	Weed; trim and adjust trees and shrubs	Weed; mow lawns, trim and adjust trees and shrubs	Weed; mow lawns, trim and adjust trees and shrubs	Mow and trim lawns Trim and adjust trees and shrubs
3	Mow and fertilise lawns; treat plant material for insects and disease	Mow lawns; weed; treat plant material for insects and disease	Mow and trim lawn	Weed
4	Weed; topdress, condition lawns and oversow bare patches; issue logbook	Weed; mow and trim lawns; issue logbook	Weed; mow lawns; issue logbook	Mow lawns; issue logbook
5	Fertilise all trees and shrubs in garden beds; mow and trim lawns	Mow lawns; weed	Mow lawns	Mow lawns
6	Weed; inspect mulch for deficiencies in cover; check and adjust irrigation	Mow lawns; check and adjust irrigation	Weed; inspect mulch for deficiencies in cover; check and adjust irrigation	Mow and trim lawns; treat for insects and disease; check and adjust irrigation
7	Reinstate mulch as required; treat plant material for insects and disease; mow lawns	Mow lawns; weed	Reinstate mulch as required; mow, trim and fertilise lawns	Weed
8	Weed; inspect condition of paving and furniture; issue logbook	Mow and trim lawns; inspect condition of paving & furniture; issue logbook	Weed; inspect condition of paving and furniture; issue logbook	Mow lawns; Inspect condition of paving and furniture; issue logbook
9	Mow and trim lawns	Mow lawns; treat plant material for insects and disease	Mow lawns	Weed

10	Weed; mow lawns	Mow and topdress lawns	Weed; treat plant material for insects and disease	Mow and trim lawns
11	Mow and fertilise lawns; trim and adjust trees and shrubs	Mow lawns; trim and adjust lawns; weed	Weed	Mow lawns; treat plant material for insects and disease
12	Weed; mow lawns; treat plant material for insects and disease	Mow, trim & fertilise lawns	Weed	Mow lawns; treat plant material for insects and disease
13	Check and adjust irrigation; mow lawns; issue logbook	Check and adjust irrigation; mow lawns; weed; issue logbook	Check and adjust irrigation; mow lawns; weed; issue logbook	Check and adjust irrigation; weed; issue logbook

6.3 IRRIGATION SCHEDULE

The following Irrigation Schedule is only applicable to the 'Defects Liability Period' and/or 'Establishment Period'.

Irrigation Maintenance Schedule

The Irrigation Maintenance Schedule should be used as a check list of minimum attendance




Task	Timeframe
Filters – Mainline	Monthly
Electrical Source Output (auto system)	Monthly
Controller (automatic system)	Monthly
Operation – Progression	Monthly
Activation of Valves	Monthly
Timing of Stations	Bi-Annually
Time and Day Readings	As Required
Exterior Appearance	Bi-Annually
Valve Operation	Bi-Annually
Open/Close Weeping	As Required
Sprinkler Operation	As Required
Rotaries – Clogged Nozzles	Bi-Monthly
Plant Obstructed Pattern	Bi-Monthly
Arc Coverage	Bi-Monthly
Radius Adjustment	Bi-Monthly
Pop-up Action	Bi-Monthly
Riser Seal Leaks	Bi-Monthly
Set to Grade	Bi-Monthly
Coverage Pressure	Bi-Monthly
Rotational Speed	Bi-Monthly

Clogged Screens	Bi-Monthly
Head Damage	Bi-Monthly
Piping	Bi-Monthly
Leaks – Broken or Cracked	As Needed
Poor Welding or Threading	As Needed
Connection	As Needed
Clogged Piping	As Needed
Irrigation Report	Bi-Monthly


6.4 PRUNING SCHEDULE


The contractor is to prune all plants or shrubs species as required to satisfy Goodman's presentation standard. Pruning should be carried out on a 'needs-basis' specific to each plant. Pruning should be carried out to encourage new growth that will result in a dense canopy density. No more than 30mm of new growth should be seen before pruning takes place. All plant pruning should be carried out using best horticultural techniques. No hedging of native grasses permitted at any time.


Pruning schedule – Western North South Link Road (WNSLR)


Plant Mix	Shape/description	Critical issues	Pruning Frequency	Planting Palette
PM3A	Verge Planting <i>Myoporum parvifolium</i>	Shrubs/Groundcovers Drought tolerant, low water and fertiliser requirements.	Shrubs/Groundcovers Prune after flowering to remove spent flowers, encourage healthy growth and to maintain safe accessibility across the site.	
PM4A	Median Planting <i>Lomandra longifolia</i> 'Veryday'	Native Grasses Drought tolerant, low water and fertiliser requirements.	Native Grasses Remove spent flowers and any dieback. Only prune to maintain safe access.	
PM4B	Median Feature Planting <i>Phormium cookianum</i> 'Tricolour' <i>Rhagodia spinescens</i> <i>Scaevola albida</i> 'Blue Mist'	Shrubs/Groundcovers Drought tolerant, low water and fertiliser requirements.	Shrubs/Groundcovers Prune after flowering to remove spent flowers, encourage healthy growth and to maintain safe accessibility across the site.	

MAINTENANCE SCHEDULES

Plant Mix	Shape/description	Critical issues	Pruning Frequency	Planting Palette
PM5	Basin Planting <i>Carex appressa</i> <i>Dianella longifolia</i> <i>Juncus usitatus</i> <i>Lomandra longifolia</i> <i>Imperata cylindrica</i>	Native Sedges/Grasses Tolerates periods of water inundation. If pruning for safe access is required never prune more than 1/3 of leaf total length.	Native Sedges/Grasses Remove spent flowers and any dieback. Only prune to maintain safe access.	

Revegetation Mix	Shape/description	Critical issues	Pruning Frequency	Planting Palette
RM1A & RM1B	Native Grasses and Groundcovers on Fill Embankment/Cut Batter <i>Aristida vagans</i> <i>Austrostipa ramosissima</i> <i>Chloris truncata</i> <i>Cymbopogon refractus</i> <i>Danthonia tenuior</i> <i>Dichelachne micrantha</i> <i>Entolasia stricta</i> <i>Eragrostis brownii</i> <i>Imperata cylindrica</i> <i>Poa labillardieri</i> <i>Themeda australis</i>	Native Grasses Drought tolerant, low water and fertiliser requirements. Shrubs/Groundcovers Drought tolerant, low water and fertiliser requirements.	Native Grasses Remove spent flowers and any dieback. Only prune to maintain safe access. Shrubs/Groundcovers Prune after flowering to remove spent flowers, encourage healthy growth and to maintain safe accessibility across the site.	

Tree Mix	Shape/description	Critical issues	Pruning Frequency	Planting Palette
Tree Mix 1	Street Trees <i>Callistemon viminalis</i>	Street Trees Plant in moist but well drained soils with full or partial sun. Susceptible to frost when juvenile. Pests include scale insects, thrips and occasionally sawfly larvae.	Trees Prune during flower dormancy, to encourage dense canopy and to maintain safe accessibility across the site.	

Tree Mix	Shape/description	Critical issues	Pruning Frequency	Planting Palette
Tree Mix 2	General Trees <i>Melaleuca decora</i>	General Trees Plant in moist soils and ensure sufficient water when young	Trees Prune during flower dormancy, to encourage dense canopy and to maintain safe accessibility across the site.	

6.5 CONTINGENCY MANAGEMENT PLAN

Contingency Management Plan – Western North South Link Road (WNSLR)

Key Element	Trigger/ Response	Condition Green	Condition Amber	Condition Red
Irrigation	Trigger	Irrigation system operating at optimum frequency.	Irrigation system yet to be installed.	Irrigation system fails.
	Response	No response required. Continue to monitor.	Provide additional hand watering until system is installed.	Provide additional hand watering until system is repaired. The irrigation system must be fully functional at all times to ensure that all plants, trees and lawns receive adequate water at optimal frequency.
Plant Failure	Trigger	No significant plant failure is present. Monitoring verifies that there is <5% of plants failing.	Monitoring verifies there is plant failure at a rate between 5% -10%.	Monitoring verifies there is plant failure at a rate greater than 10%.

Key Element	Trigger/ Response	Condition Green	Condition Amber	Condition Red
	Response	No response required. Continue to monitor.	If the cause of failure is due to a controllable situation then correct situation prior to replacing plants. All planting areas are to be free of grass and weed. Replace plants with one of similar size and quality and identical species. of variety of the ones failed.	If the cause of failure is due to a controllable situation then correct situation prior to replacing plants. All planting areas are to be free of grass and weed. Replace plants with one of similar size and quality and identical species. of variety of the ones failed.
Revegetation Failure	Trigger	Revegetation is growing to desired design surface levels	Monitoring verifies that weed emergence has occurred.	Monitoring verifies that weed emergence and plant failure has occurred.
	Response	No response required. Continue to monitor.	Refer to LMP for monitoring requirements once problem has been identified. Possible solutions include the removal of weeds as per Section 5.3.7 of this LMP.	Refer to LMP for monitoring requirements once problem has been identified. Possible solutions include removal of weeds and re-seeding of revegetation cover crop as per Section 5.3.7 of this LMP.
Slope Failure	Trigger	No significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the end land use. Monitoring verifies there are no gully or tunnel erosion features, or rill erosion >200mm deep.	Monitoring verifies there is gully or tunnel erosion features, or rill erosion 200mm deep.	Monitoring verifies there is gully or tunnel erosion features, or rill erosion > 200mm deep.

Key Element	Trigger/ Response	Condition Green	Condition Amber	Condition Red
	Response	No response required. Continue to monitor.	A suitably trained person to inspect the site. Investigate opportunities to install water management infrastructure to address erosion. Remediate as appropriate.	Undertake a review of the drainage of the area and provide recommendations to appropriately remediate the erosion. Remediate as soon as practicable.

7 APPENDICES

7.1 PENRITH CITY COUNCIL EMAIL CORRESPONDANCE

From: **Dennis Urena** dennis.urena@penrith.city
 Subject: RE: Oakdale West - Western North South Link Road
 Date: 29 October 2018 at 12:09 pm
 To: Chris Houghton chris@scapedesign.com.au
 Cc: Alexandra Chung alexandrac@atl.net.au, Ella Farley ella@scapedesign.com.au, Alex Lohrisch AlexL@atl.net.au, Anthony McLandsborough Anthony@atl.net.au



Hi Chris,

Please find below, Council's advice/response to your queries.

Regards

Dennis Urena
 Senior Engineer - Major Developments

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On 18 Oct 2018, at 10:54 am, Chris Houghton <chris@scapedesign.com.au> wrote:

Hi Dennis

Thank you for your offer to assist us. Please see below queries.

1. Along the new road, the concept design indicates clustered planting of native trees with native groundcover, in beds. These beds are spaced fairly evenly along the road verge and are separated from turf with concrete flush kerb. The tree species is *Corymbia maculata* (spaced min 600 from kerb) and ground cover species is *Myoporum parvifolium*. *Corymbia* are used in this fashion elsewhere in the precinct (Penrith LGA) and the client is keen to maintain this language on the streetscape. Are the species, particularly the tree species acceptable to council? See attached image (ballast rock replaced by groundcover and wood chip). **PCC Advice** – Council does have concerns about *Corymbia maculata* on the road verges. Around ten years ago, a storm came through Jamisontown and *Corymbia maculatas* came down with Harris St and McNaughton St being the hardest hit. Following that storm Council went through a program of removing the maculatas. They lifted gutters and roads causing a lot of damage. A lot of the works on the trees needed to be done by contractors because they exceeded the limit of our cherrypicker. A smaller tree that can handle clay soils and the extreme heat of Western Sydney may be a

better option.

2. What is council's preferred species of turf for verges? Currently we have specified Zoysia as this is in line with RMS preferences, however the concept plan specifies Couch. **PCC advice** – The WNSLR is expected to be a State Road, therefore the turfing is to be in line with RMS preferences/requirements.

Note: See 9.1.6 of Council's Construction Specification for Council's requirements. Council will not support the use of Kikuyu grass in any road, drainage or landscaping works adjacent to sensitive areas including national parks and reserves, other bushland area and water ways.

3. The medians will be planted where width and sightlines permit. At the ends of medians a low groundcover *Scaevola* is proposed. It has proven to be hardy in other nearby areas. Generally along planted medians *Lomandra* 'Verday' (similar to 'Tanika' is proposed. Is this approach acceptable to council? **PCC advice** - A mix of *Scaevola* with *Rhagodia* might be better than a monoculture.

4. Roadside batters between the verge and road corridor boundary are proposed to be revegetated using RMS specified techniques. The treatment type is proposed to be hydro seeding over ameliorated site topsoil on prepared batters. The species mix will comprise (a) native grasses approved by our ecologist in combination with (b) couch (to ensure a mixture of long term 'pasture' like coverage, in keeping with the general area) and (c) covercrop (for initial stabilisation and provision of organic matter following the initial growing season). Does council approve this approach and species? **PCC advice** – The WNSLR is expected to be a State Road, therefore the roadside batters is to be in line with RMS specified techniques.

We are in the final stages of our revised construction documentation for this project and would appreciate feedback being provided at the soonest opportunity. Please contact me if you wish to discuss.

Many thanks

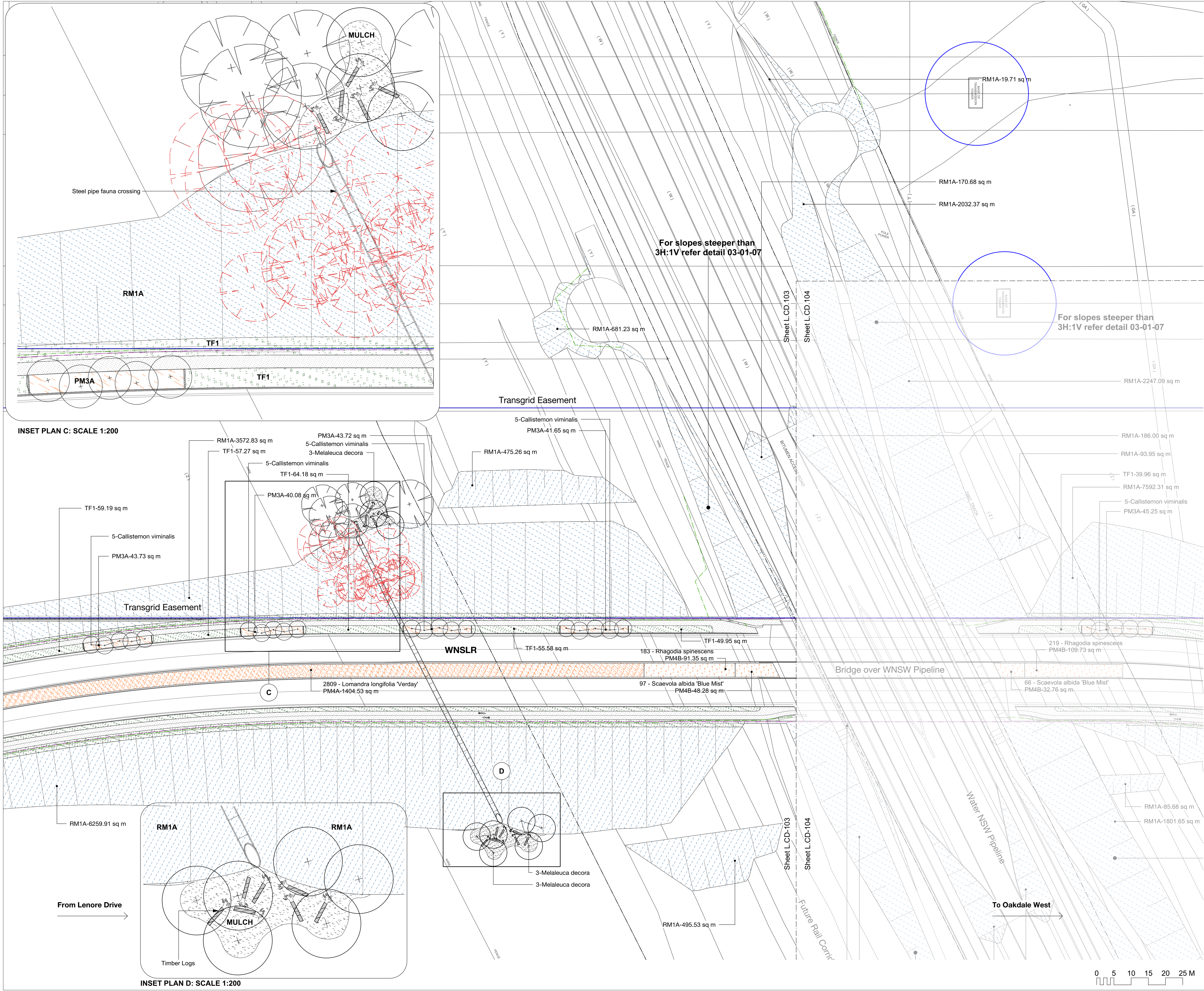
Regards,

Chris Houghton
Director
Registered Landscape Architect AILA #1189

<IMG_2652.jpeg>

On 17 Oct 2018, at 1:53 pm, Dennis Urena
<dennis.urena@penrith.city> wrote:

7.2 REFERENCED LANDSCAPE DRAWINGS



LEGEND

General

- Existing property boundary
- Proposed boundary
- Limit of works

Existing Features

- Existing fencing
- Existing water main
- Existing high voltage easement
- Existing sewer line
- Existing easement

Upgrade Features

- Road control line
- Proposed footpath/shared path refer Civil Eng dwgs.
- Proposed drainage culvert refer Civil Eng dwgs.
- Proposed fencing refer Civil Eng dwgs.
- Proposed guardrail refer Civil Eng dwgs.
- Drainage swale refer Civil Eng dwgs.
- Proposed retaining wall refer Civil Eng dwgs.
- Ballast refer detail 03-02-23
- Sandstone boulder refer detail 03-02-23

Landscape Treatments

- RM1A** Revegetation mix type 1A Native grasses on fill embankment refer detail 03-01-03
- RM1B** Revegetation mix type 1B Native grasses on cut buffer refer detail 03-01-03
- PM3A** Planting mix type 3A Verge refer detail 03-02-20
- PM4A** Planting mix type 4A Median planting mix refer detail 03-02-15
- PM4B** Planting mix type 4B Median feature planting mix refer detail 03-02-23
- PM5** Planting mix type 5 Basin planting mix refer detail 03-02-10
- TF1** Turf rolls General refer detail 01-05-01
- TF2** Turf rolls with jute net and pins Drainage swales refer detail 03-02-19
- MU** Mulch General refer detail 03-02-21
- Existing tree retain
- Existing tree removed
- Existing tree removed (not surveyed)
- Rock piling refer Civil Eng dwgs.

Note:

- Should any plant species not be available at the time of plant ordering, it should be brought to the landscape architects attention immediately. Supplementary species should be recommended by contractor for approval by landscape architect.
- The following species may be used in the event that substitutions are necessary in Revegetation Mixes 1A/1B:
- *Agrostis avenacea* - *Agrostis parviflora* - *Arthropodium milleflorum* - *Capillipedium spicigerum* - *Danthonia racemosa* - *Dichelachne rara* - *Echinopogon caespitosus* - *Echinopogon ovalis* - *Eragrostis leptostachya* - *Microstena stipoides* - *Opotermus aemulus*
- Timber logs at fauna culvert entries to comprise coarse woody debris sourced from site-felled trees

scape design

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Address Suite 9, 37-38 East Esplanade
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email office@sapedesign.com.au
Web www.sapedesign.com.au

PROJECT
Western North South Link Road

Oakdale West

CLIENT
Goodman Property Services

M	ISSUED FOR CONSTRUCTION CERTIFICATE	MF	30/9/19
L	ISSUED FOR CONSTRUCTION CERTIFICATE	MF	8/7/19
K	REVISED IFC	MF	22/5/19
J	REVISED IFC	MF	16/5/19
I	REVISED IFC	MF	29/3/19
revision	revision description	by	date

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Landscape Plan Sheet 3

scale	1:500@A1
drawn	HW/EF
checked	CH
project no.	SD163-18
project phase	Construction Documentation

L.CD.103

0 5 10 15 20 25 M

LEGEND

General

- Existing property boundary
- Proposed boundary
- Limit of works
- Existing Features
 - Existing fencing
 - Existing water main
 - Existing high voltage easement
 - Existing sewer line
 - Existing easement

Upgrade Features

- Road control line
- Proposed footpath/shared path refer Civil Eng dwgs.
- Proposed drainage culvert refer Civil Eng dwgs.
- Proposed fencing refer Civil Eng dwgs.
- Proposed guardrail refer Civil Eng dwgs.
- Drainage swale refer Civil Eng dwgs.
- Proposed retaining wall refer Civil Eng dwgs.
- Ballast refer detail 03-02-23
- Sandstone boulder refer detail 03-02-23

Landscape Treatments

- RM1A** Revegetation mix type 1A Native grasses on fill embankment refer detail 03-01-03
- RM1B** Revegetation mix type 1B Native grasses on cut buffer refer detail 03-01-03
- PM3A** Planting mix type 3A Verge refer detail 03-02-20
- PM4A** Planting mix type 4A Median planting mix refer detail 03-02-15
- PM4B** Planting mix type 4B Median feature planting mix refer detail 03-02-23
- PM5** Planting mix type 5 Basin planting mix refer detail 03-02-10
- TF1** Turf rolls General refer detail 01-05-01
- TF2** Turf rolls with jute net and pins Drainage swales refer detail 03-02-19
- MU** Mulch General refer detail 03-02-21
- Existing tree retain
- Existing tree removed
- Existing tree removed (not surveyed)
- Rock piling refer Civil Eng dwgs.

- Note:**
- Should any plant species not be available at the time of plant ordering, it should be brought to the landscape architects attention immediately. Supplementary species should be recommended by contractor for approval by landscape architect.
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 - Timber logs at fauna culvert entries to comprise coarse woody debris sourced from site-felled trees

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Web www.scapedesign.com.au

PROJECT
Western North South Link Road

CLIENT
Goodman Property Services

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M	ISSUED FOR CONSTRUCTION CERTIFICATE	MF	8/7/19
L	REVISED IFC	MF	4/7/19
K	REVISED IFC	MF	22/5/19
J	REVISED IFC	MF	16/5/19
revision	revision description	by	date

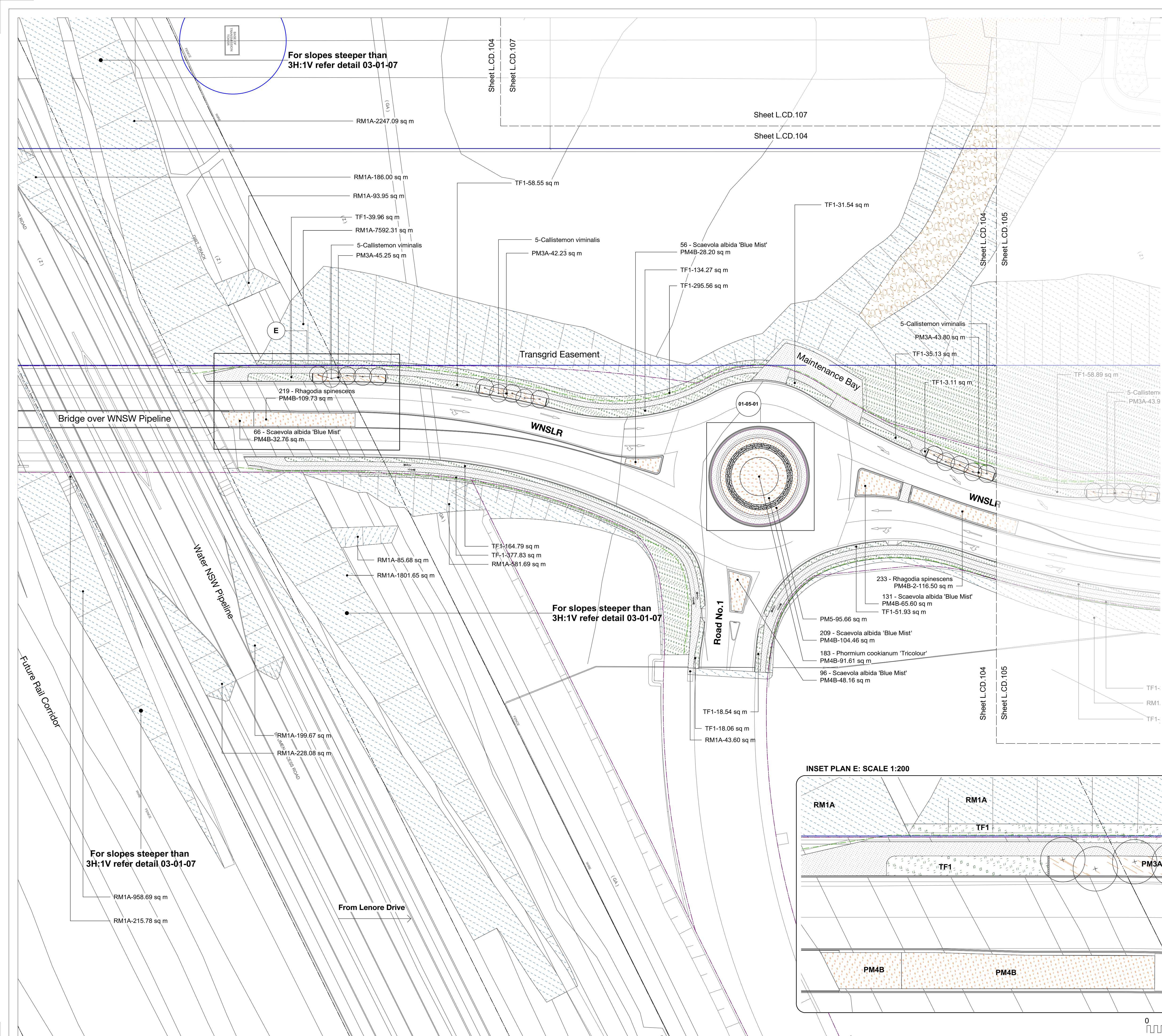
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Landscape Plan Sheet 4

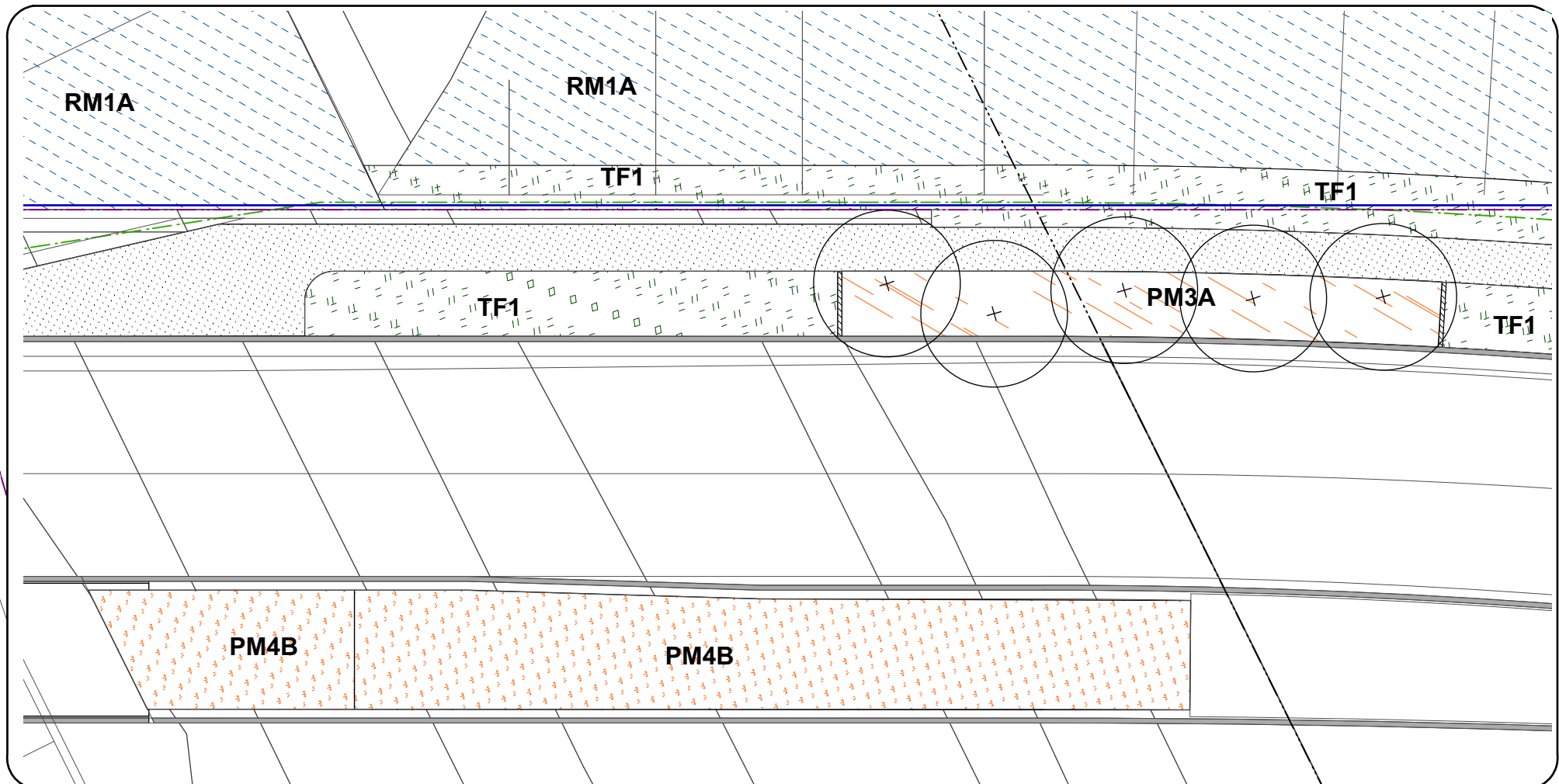
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project no.	SD163-18
project phase	Construction Documentation

L.CD.104

N



INSET PLAN E: SCALE 1:200



0 5 10 15 20 25 M

LEGEND

General

- Existing property boundary
- Proposed boundary
- Limit of works

Existing Features

- Existing fencing
- Existing water main
- Existing high voltage easement
- Existing sewer line
- Existing easement

Upgrade Features

- Road control line
- Proposed footpath/shared path
refer Civil Eng dwgs.
- Proposed drainage culvert
refer Civil Eng dwgs.
- Proposed fencing
refer Civil Eng dwgs.
- Proposed guardrail
refer Civil Eng dwgs.
- Drainage swale
refer Civil Eng dwgs.
- Proposed retaining wall
refer Civil Eng dwgs.
- Ballast
refer detail 03-02-23
- Sandstone boulder
refer detail 03-02-23

Landscape Treatments

- RM1A** Revegetation mix type 1A
Native grasses on fill embankment
refer detail 03-01-03
- RM1B** Revegetation mix type 1B
Native grasses on cut buffer
refer detail 03-01-03
- PM3A** Planting mix type 3A
Verge
refer detail 03-02-20
- PM4A** Planting mix type 4A
Median planting mix
refer detail 03-02-15
- PM4B** Planting mix type 4B
Median feature planting mix
refer detail 03-02-23
- PM5** Planting mix type 5
Basin planting mix
refer detail 03-02-10
- TF1** Turf rolls
General
refer detail 01-05-01
- TF2** Turf rolls with jute net and pins
Drainage swales
refer detail 03-02-19
- MU** Mulch
General
refer detail 03-02-21
- Existing tree
retain
- Existing tree
removed
- Existing tree
removed
(not surveyed)
- Rock piling
refer Civil Eng dwgs.

- Note:**
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Web www.scapedesign.com.au

PROJECT
Western North South Link Road

Oakdale West
CLIENT
Goodman Property Services

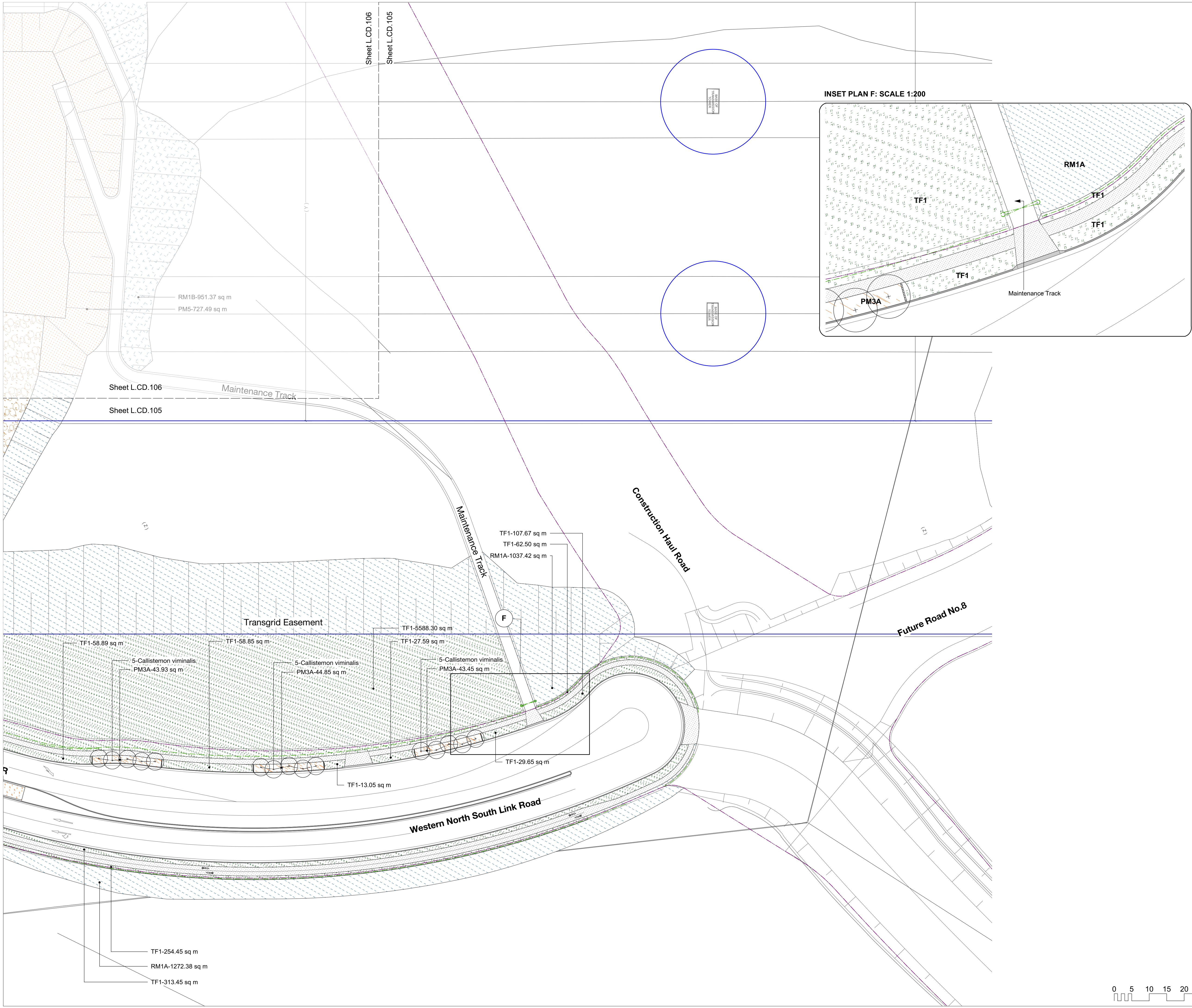
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J	REVISED IFC	MF	22/5/19
I	REVISED IFC	MF	16/5/19
revision	revision description	by	date

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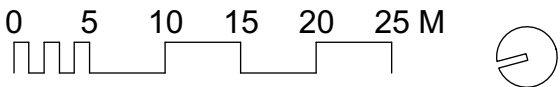
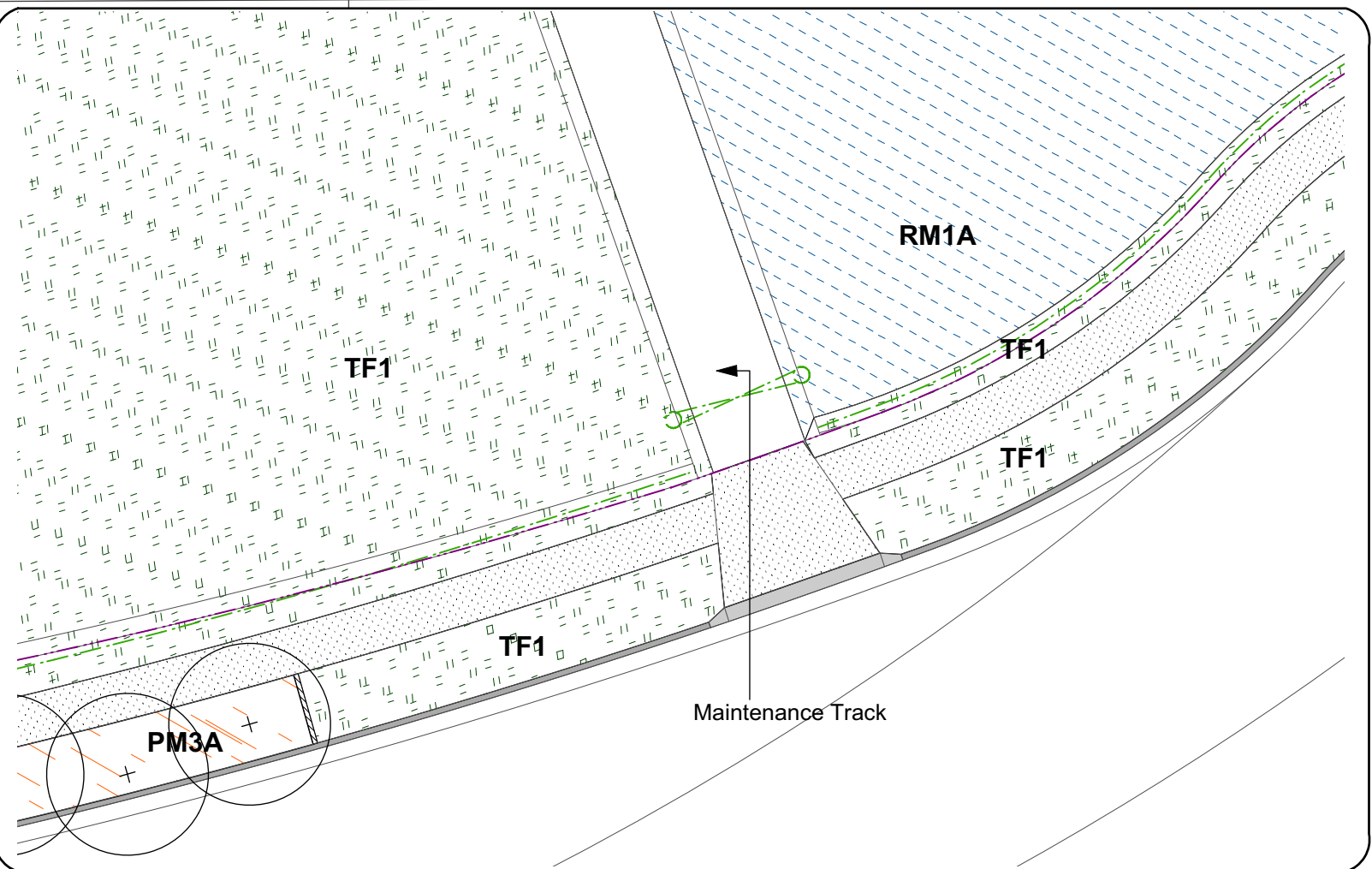
Landscape Plan Sheet 5

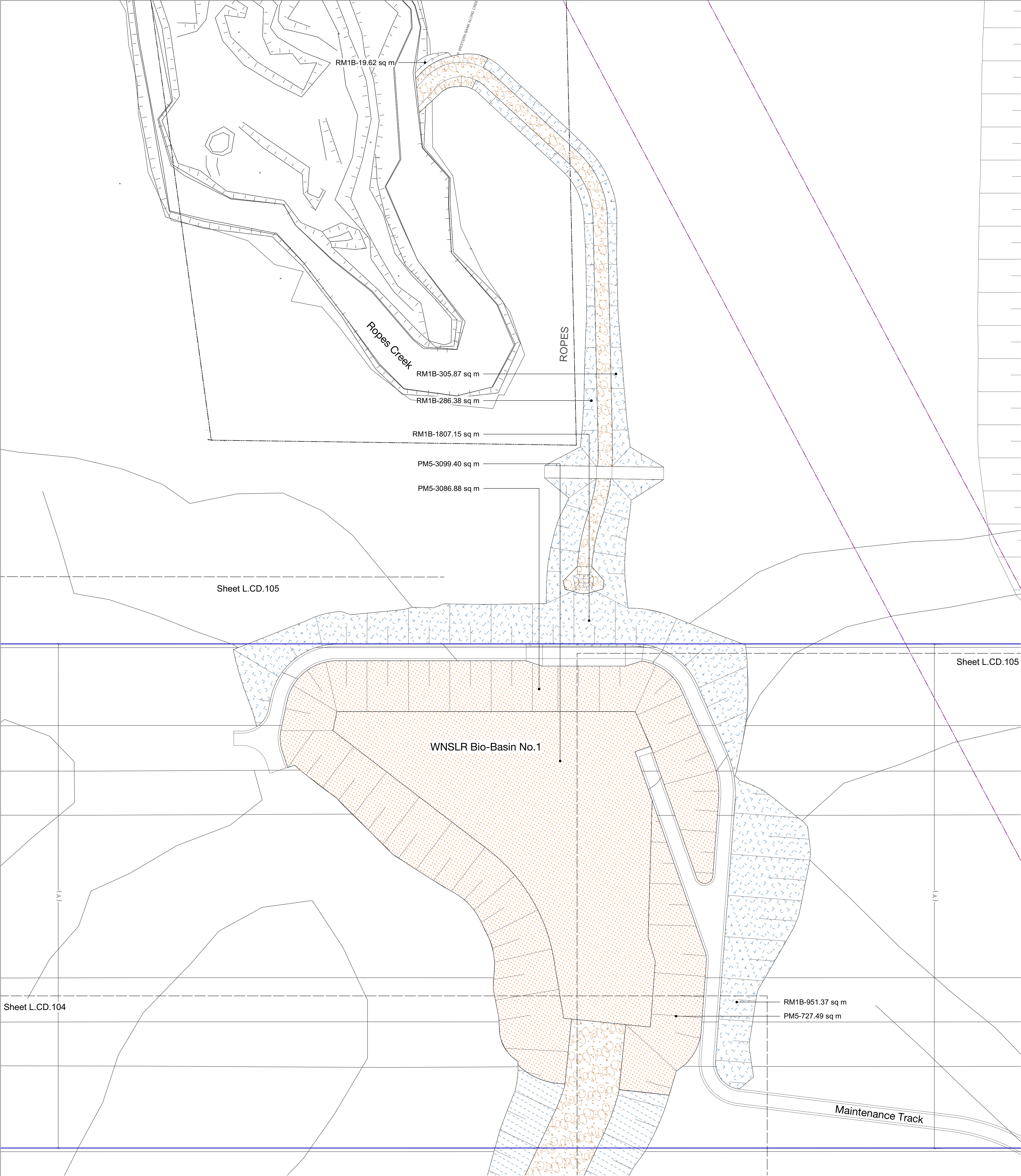
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project no. SD163-18
project phase Construction Documentation

L.CD.105 M



INSET PLAN F: SCALE 1:200





LEGEND

- General**
- Existing property boundary
 - Proposed boundary
 - Limit of works
- Existing Features**
- Existing fencing
 - Existing water main
 - Existing high voltage easement
 - Existing sewer line
 - Existing easement
- Upgrade Features**
- Road control line
 - Proposed footpath/shared path
refer Civil Eng dwgs.
 - Proposed drainage culvert
refer Civil Eng dwgs.
 - Proposed fencing
refer Civil Eng dwgs.
 - Proposed guardrail
refer Civil Eng dwgs.
 - Drainage swale
refer Civil Eng dwgs.
 - Proposed retaining wall
refer Civil Eng dwgs.
 - Ballast
refer detail 03-02-23
 - Sandstone boulder
refer detail 03-02-23
- Landscape Treatments**
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Native grasses on fill embankment
refer detail 03-01-03
 - RM1B** Revegetation mix type 1B
Native grasses on cut buffer
refer detail 03-01-03
 - PM3A** Planting mix type 3A
Verge
refer detail 03-02-20
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Median planting mix
refer detail 03-02-15
 - PM4B** Planting mix type 4B
Median feature planting mix
refer detail 03-02-23
 - PM5** Planting mix type 5
Basin planting mix
refer detail 03-02-10
 - TF1** Turf rolls
General
refer detail 01-05-01
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Web www.scapedesign.com.au

PROJECT
Western North South Link Road

CLIENT
Goodman Property Services

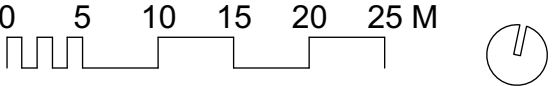
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J	REVISED IFC	MF	22/5/19
I	REVISED IFC	MF	16/5/19
revision	revision description	by	date

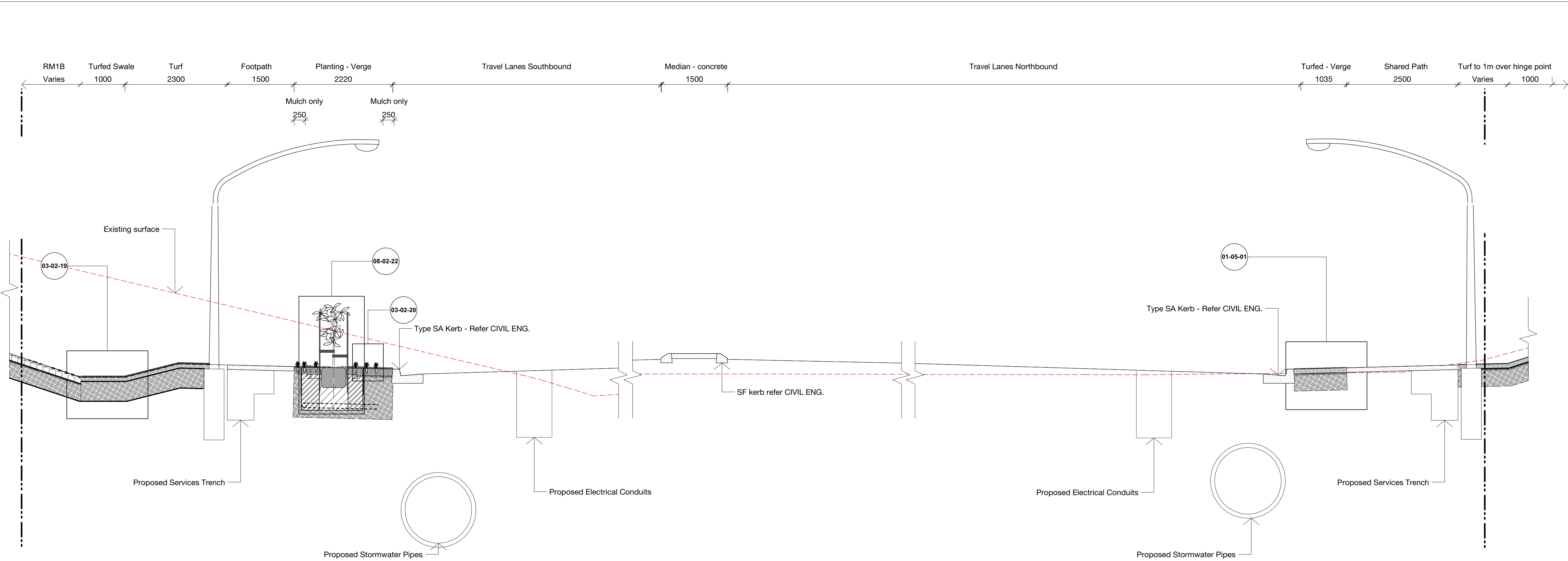
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Landscape Plan Sheet 6

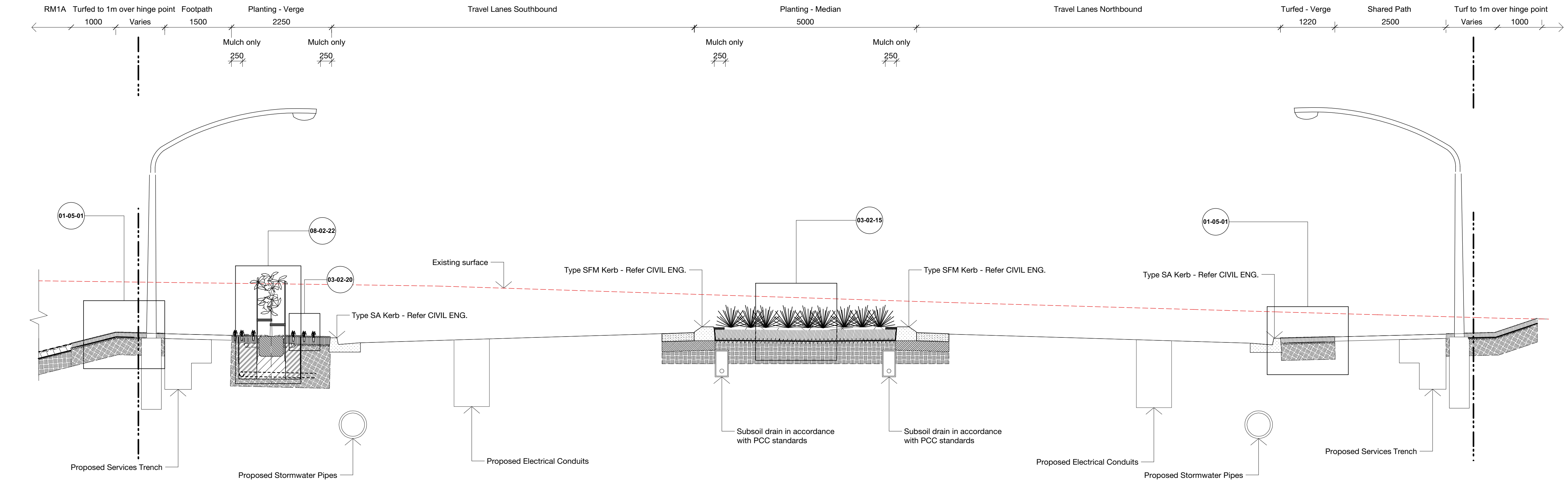
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project phase	Construction Documentation

L.CD.106 M

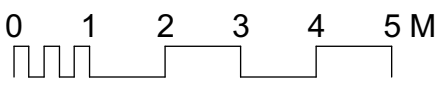




01 Typical Cross Section - Western North-South Link Road (MC03 CH60 to CH120)
Scale 1:50 @ A1



02 Typical Cross Section - Western North-South Link Road (MC03 CH280 to CH420)
Scale 1:50 @ A1



LEGEND

scape design

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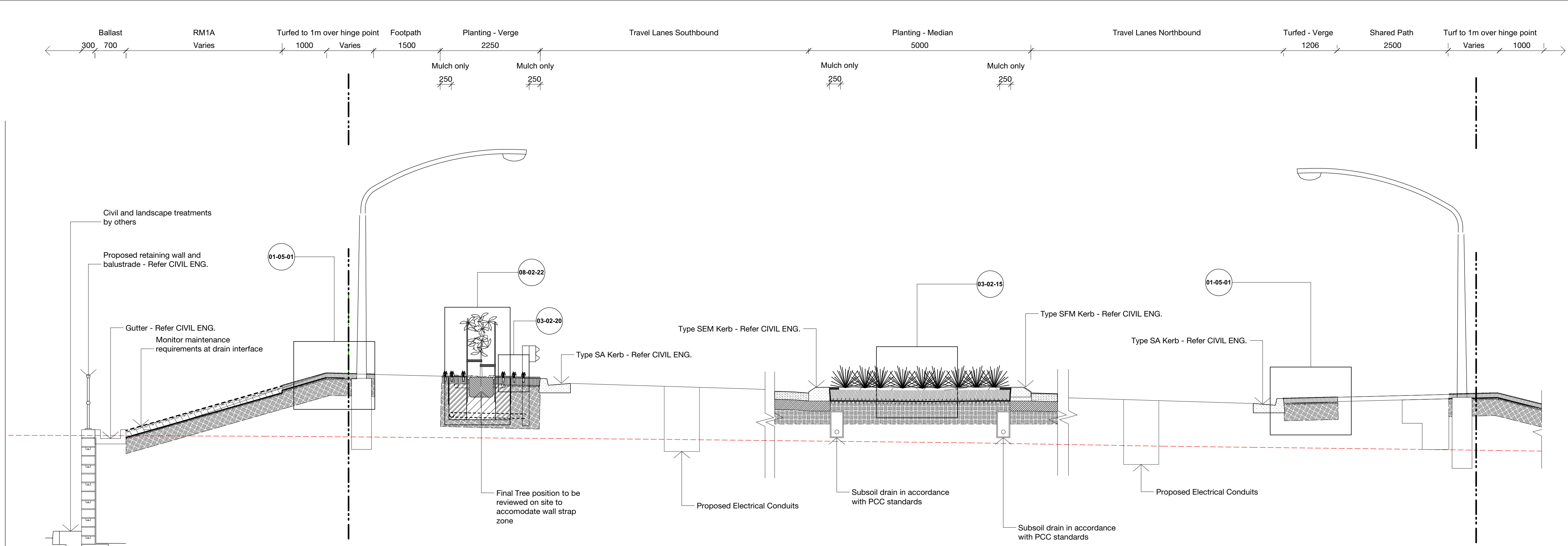
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J	REVISED IFC	MF	16/5/19
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revision	revision description	by	date

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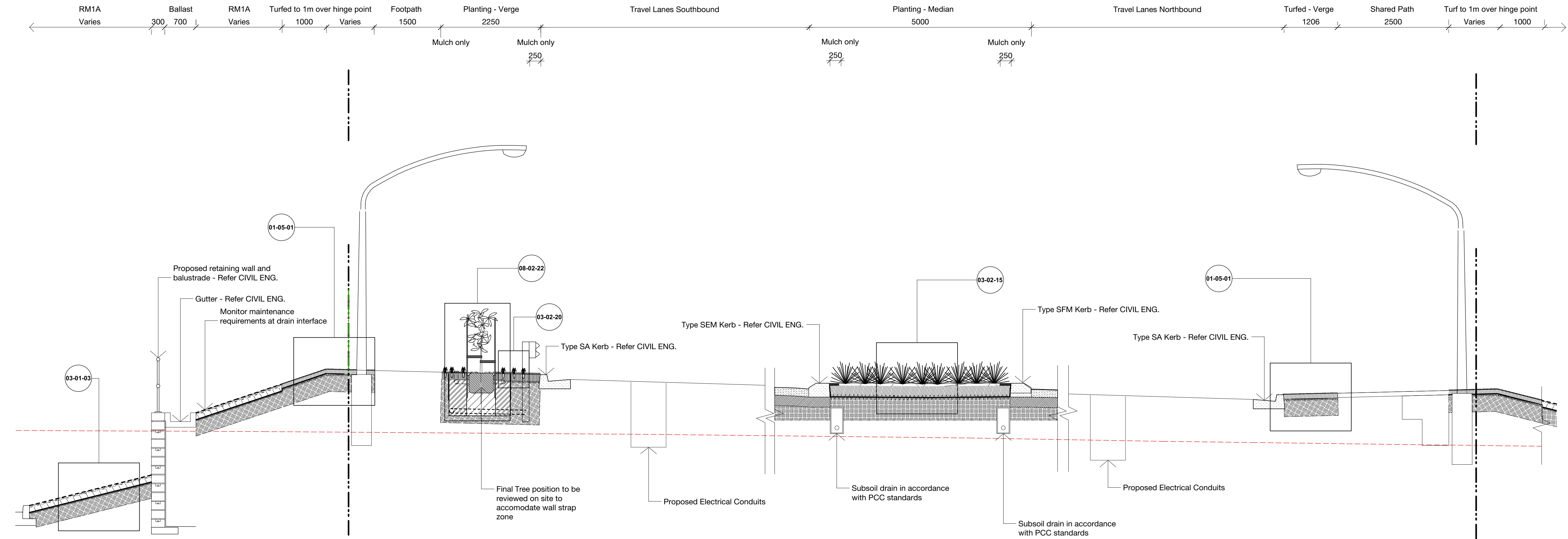
Landscape Section 1

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project no.	SD163-18
project phase	Construction Documentation

L.CD.201 M



03 Typical Cross Section - Western North-South Link Road (MC03 CH420 to CH560)
Scale 1:50 @ A1



04 Typical Cross Section - Western North-South Link Road (MC03 CH560 to CH650)
Scale 1:50 @ A1

LEGEND

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PROJECT

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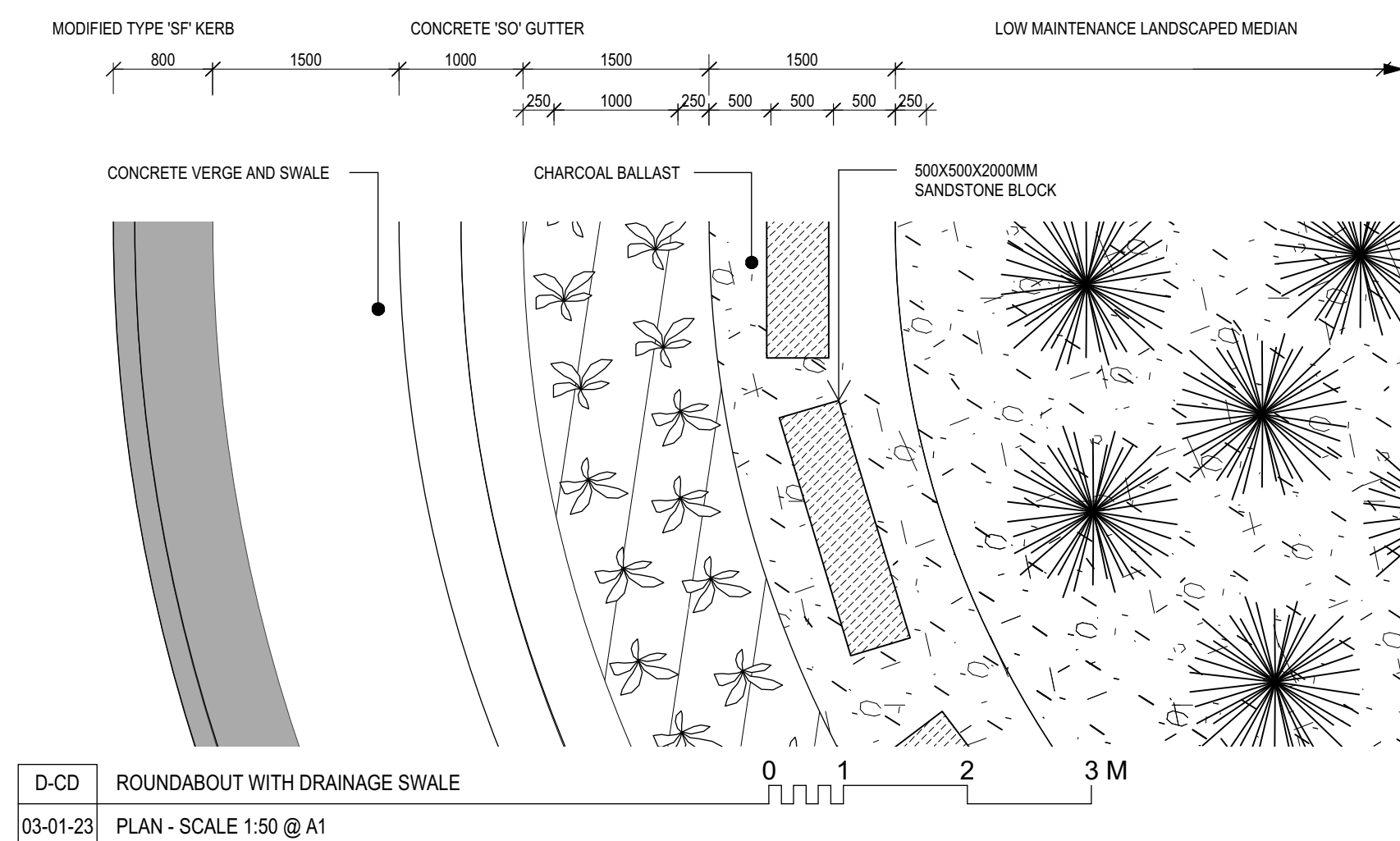
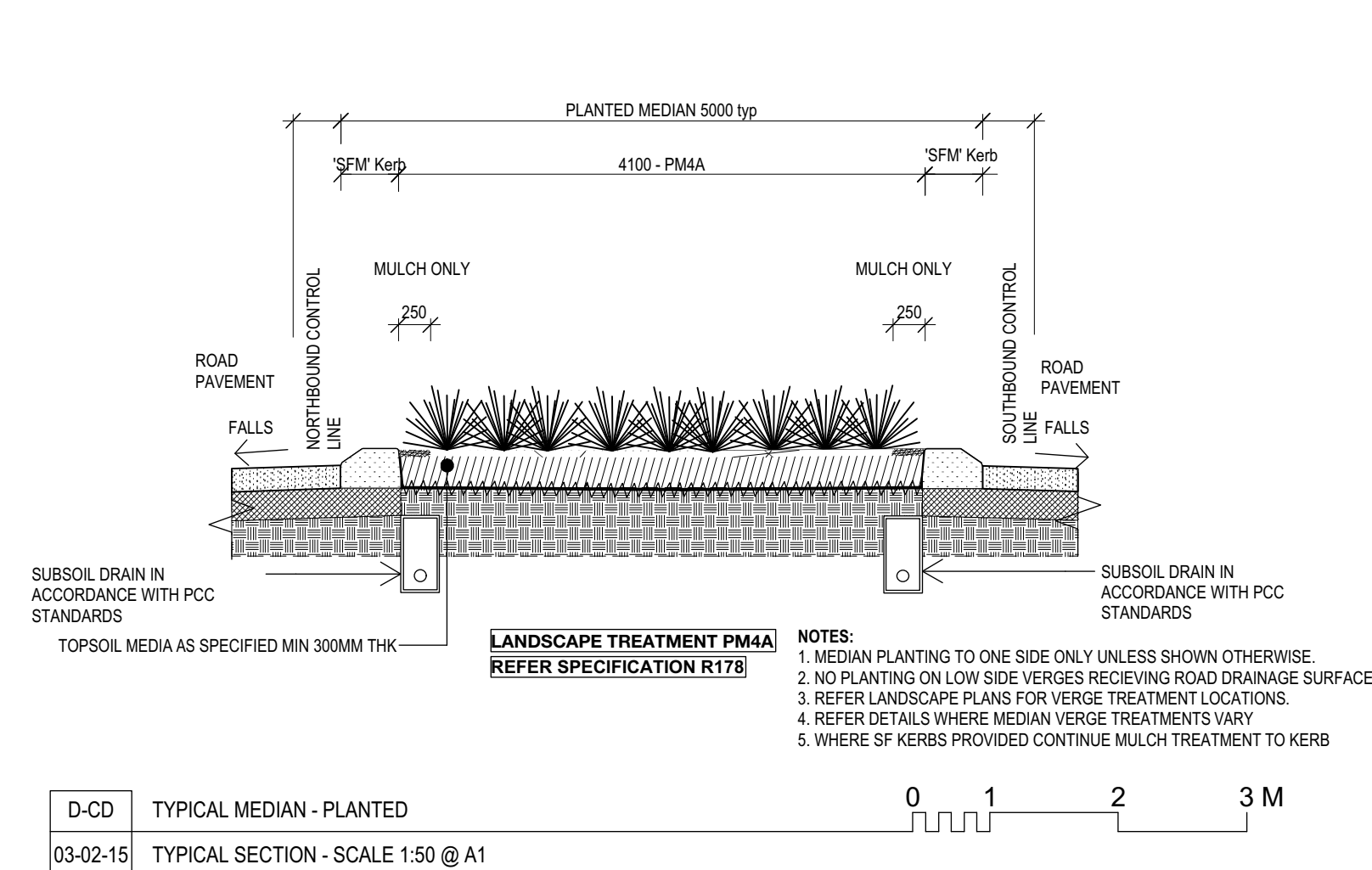
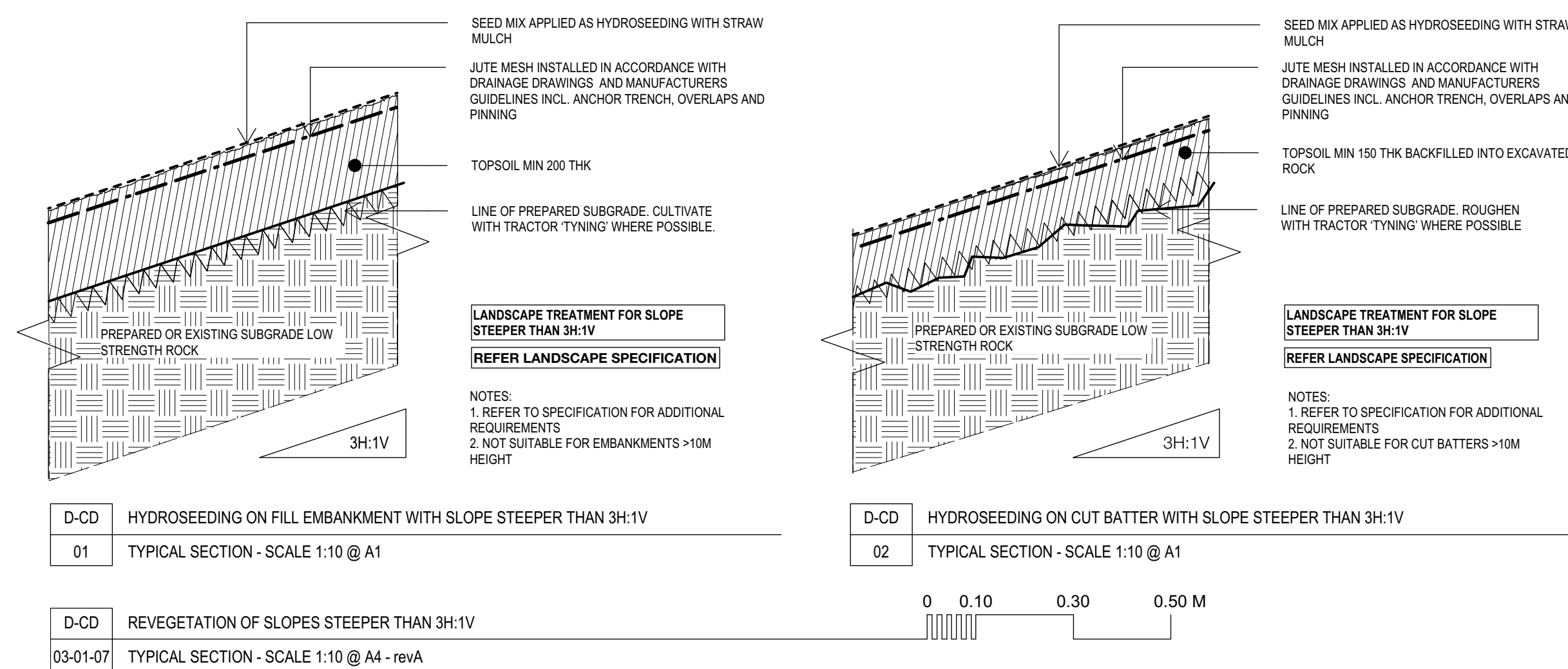
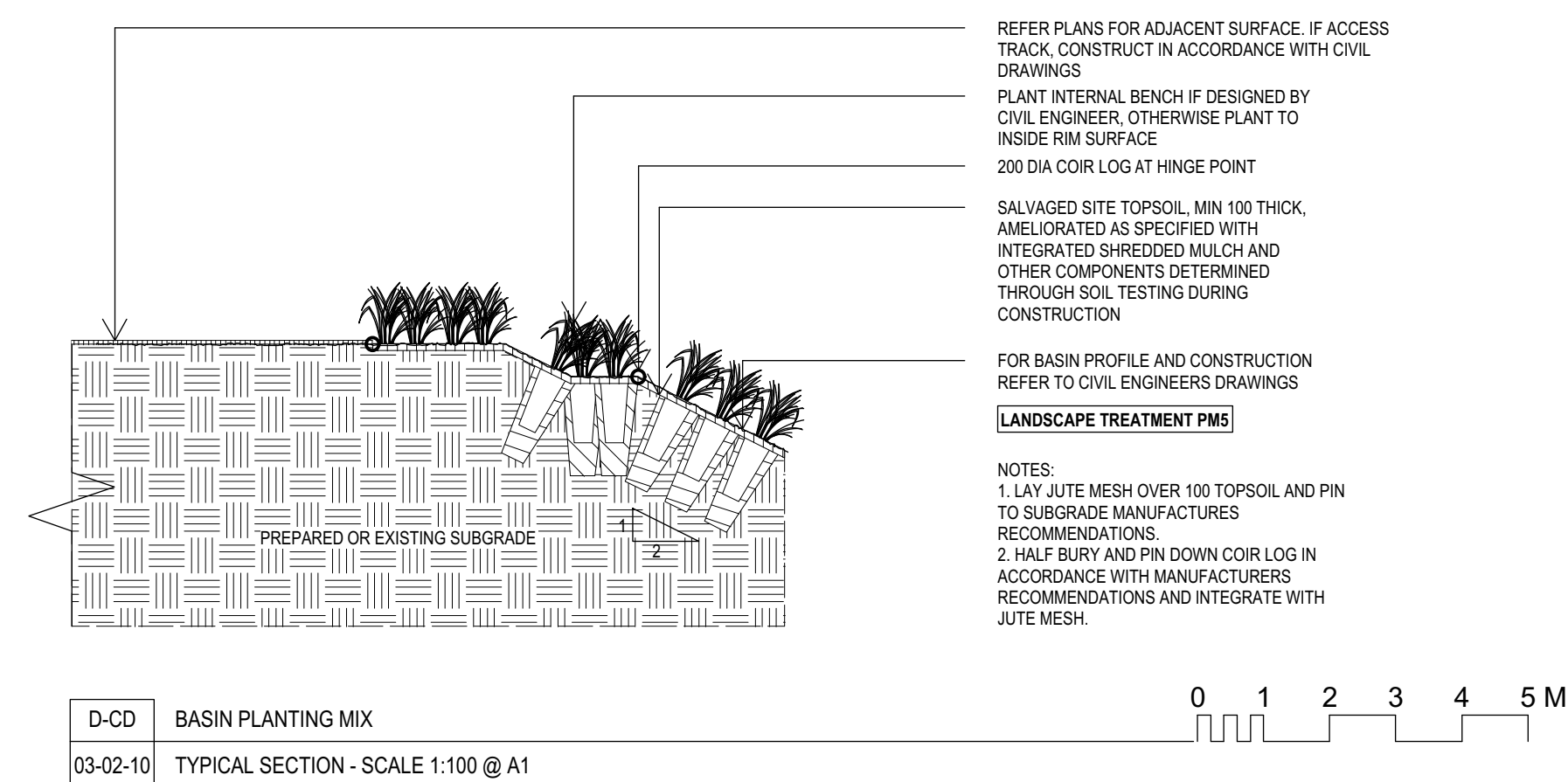
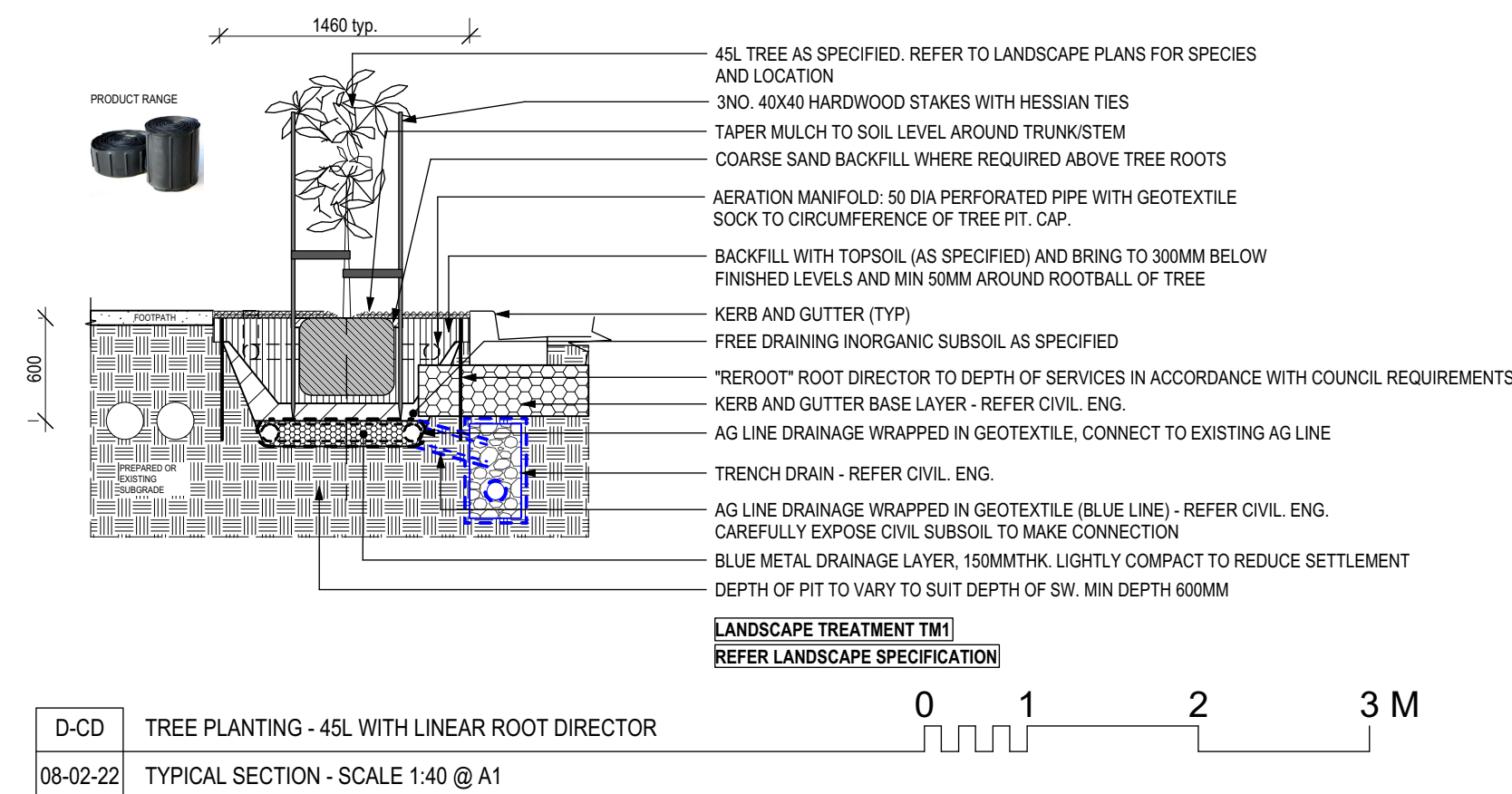
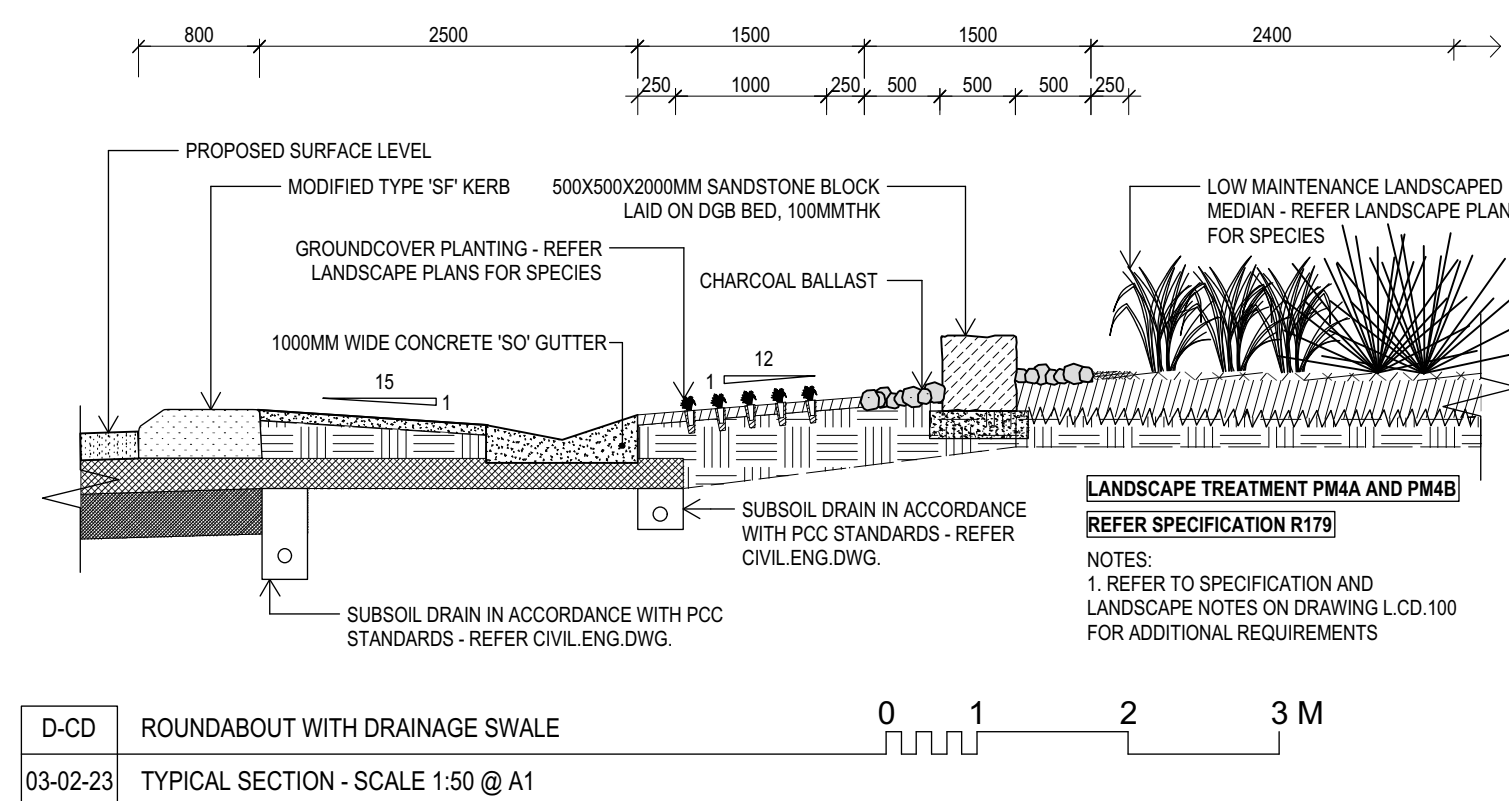
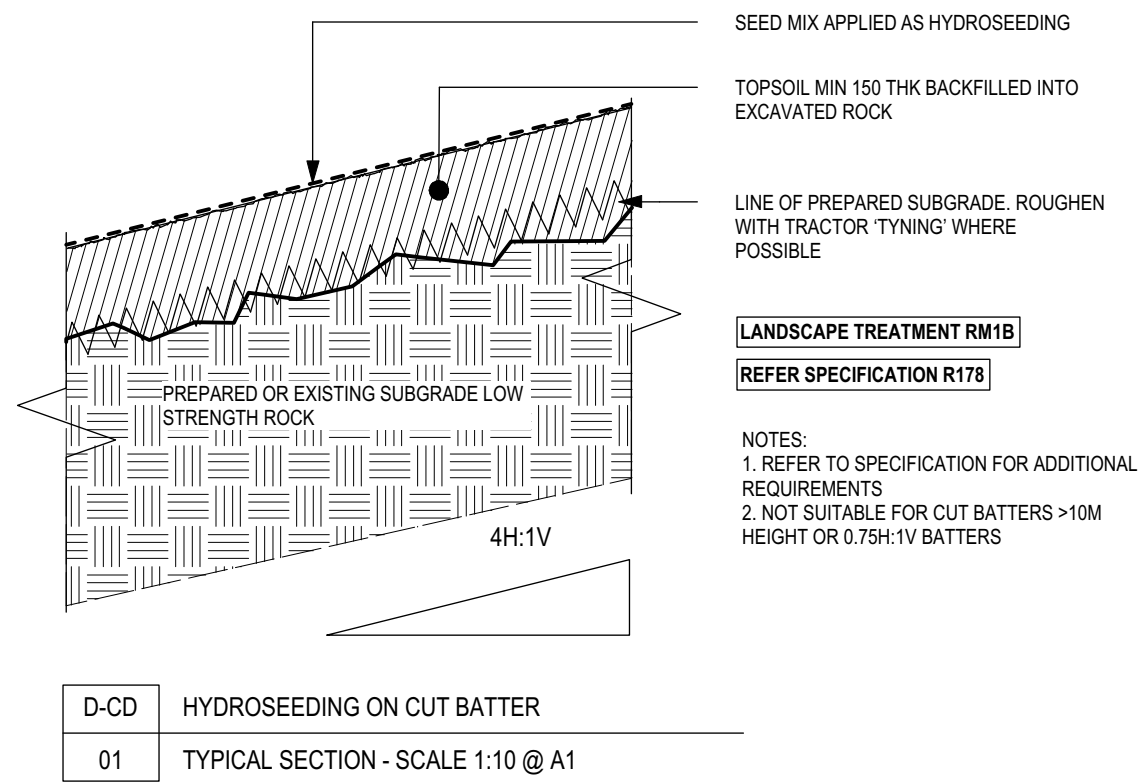
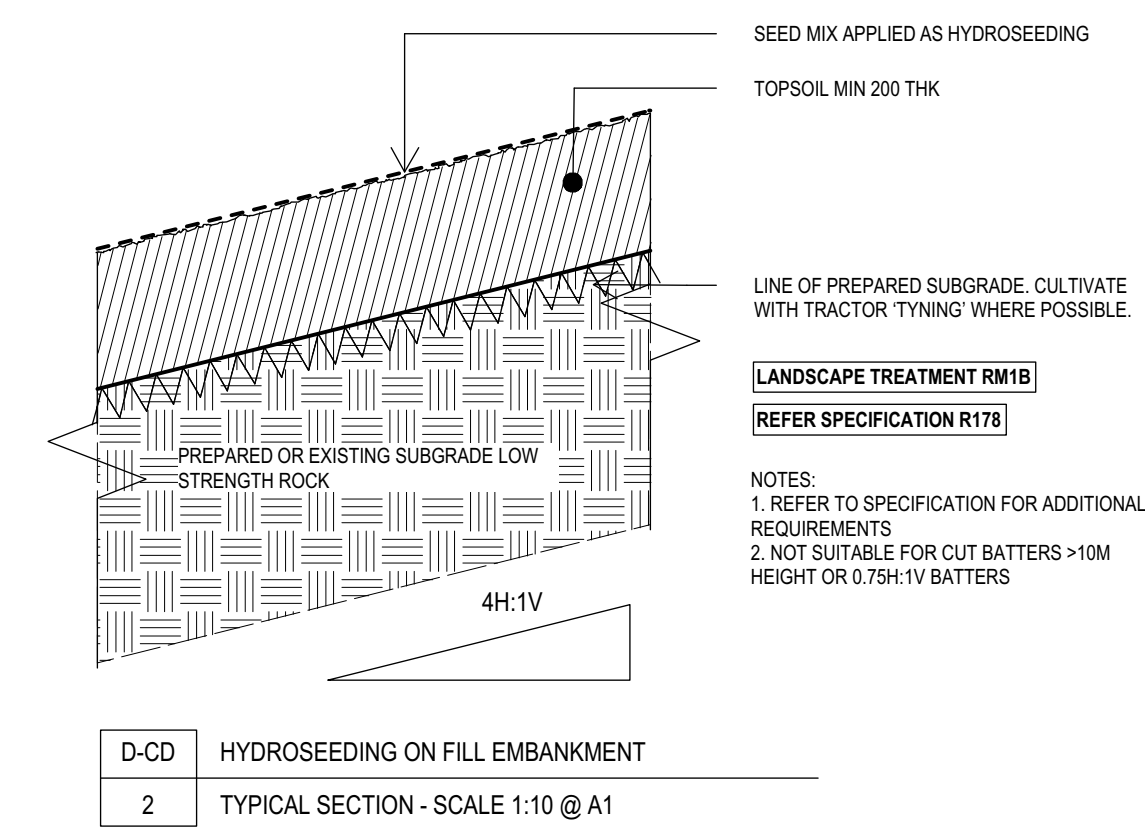
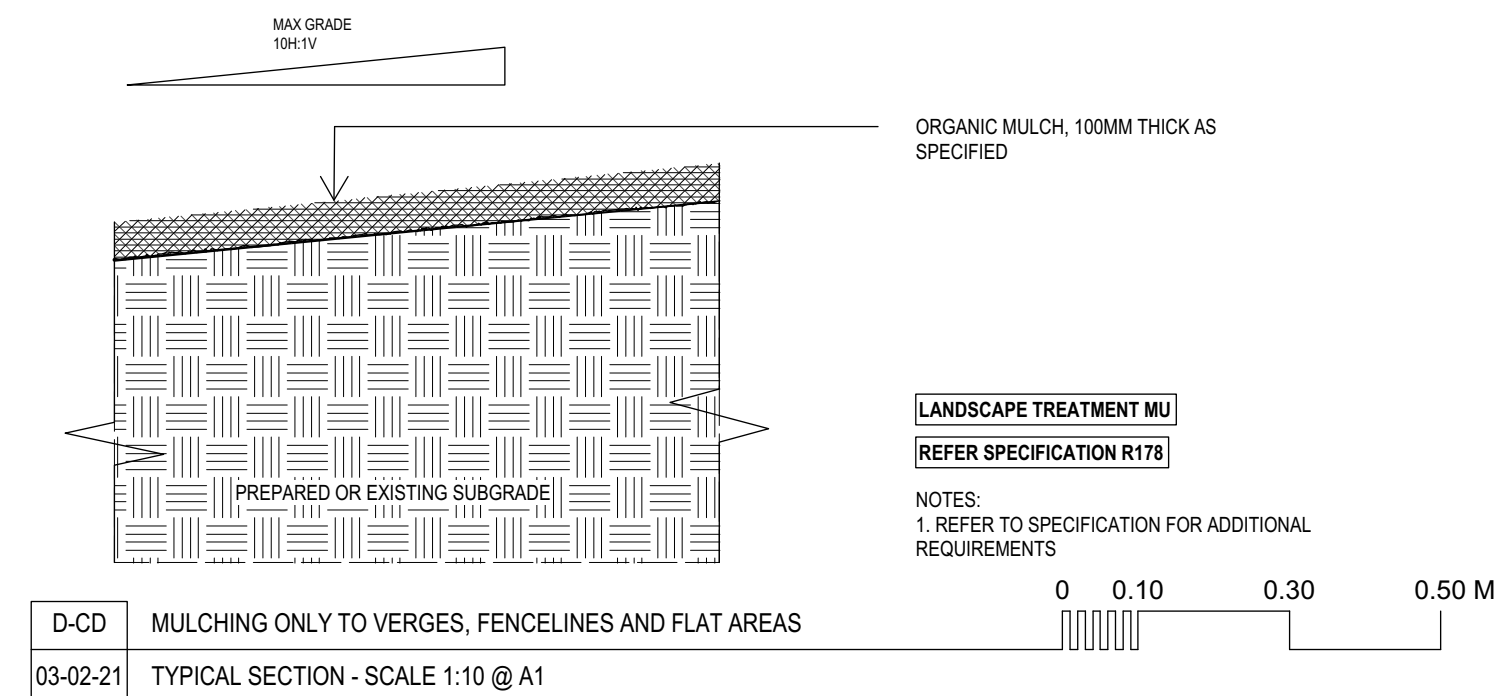
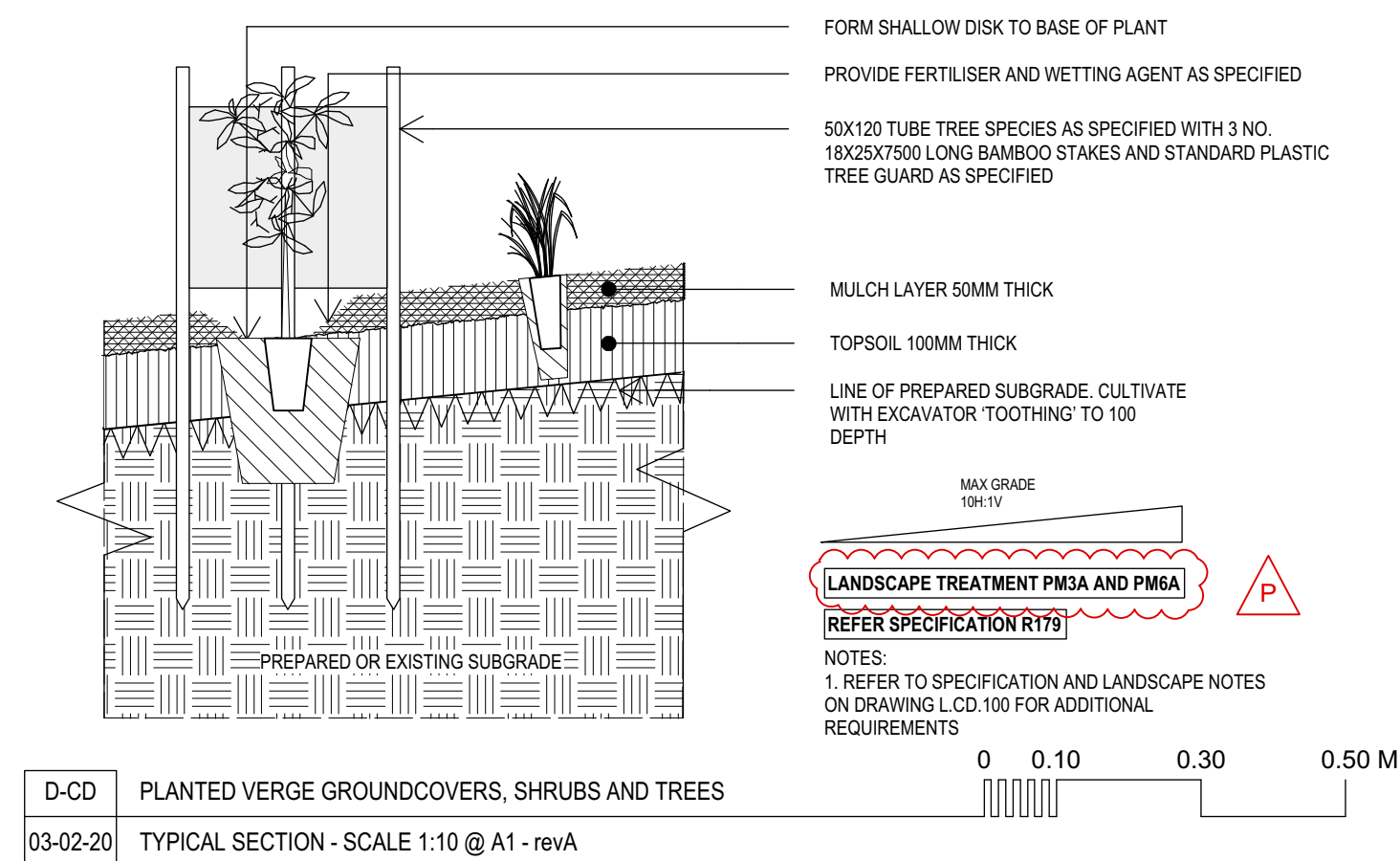
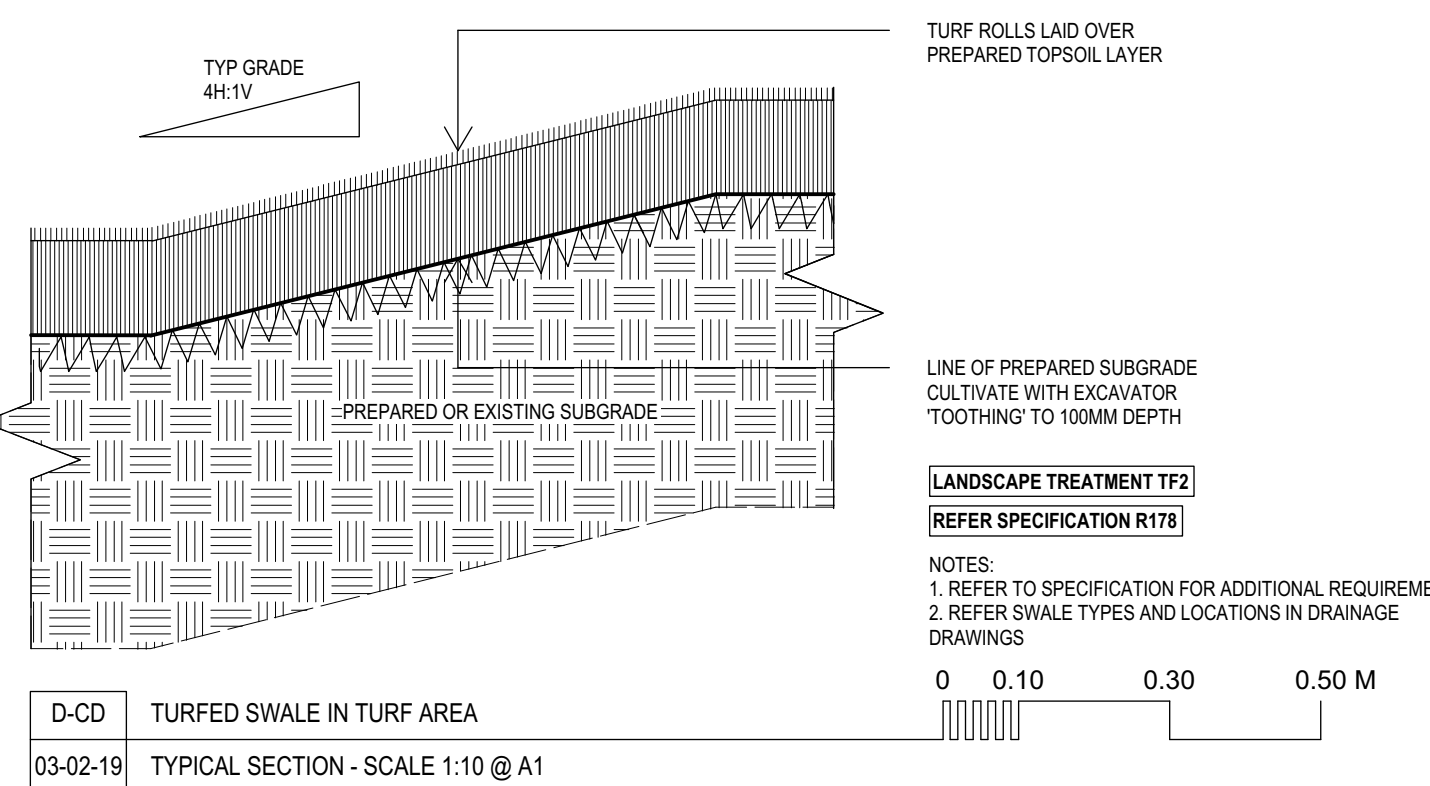
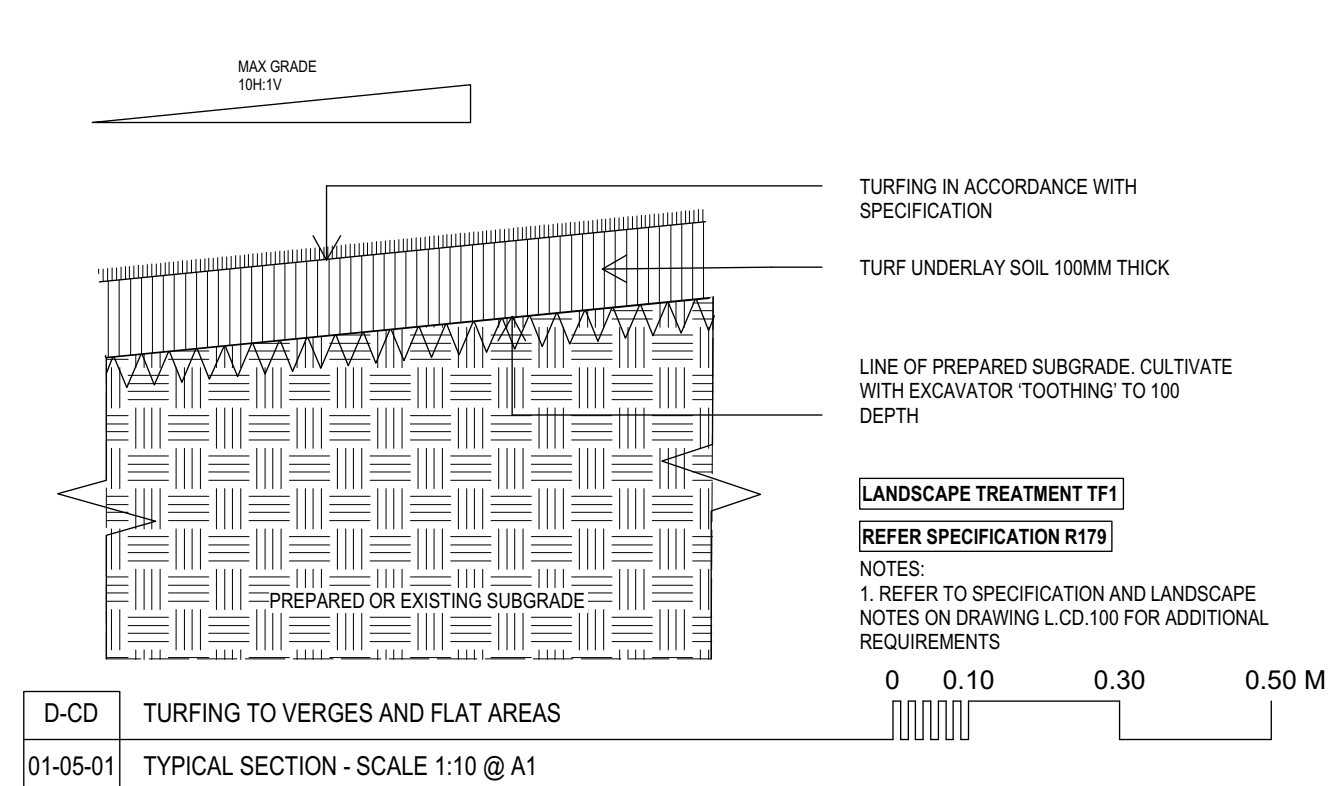
Landscape Section 2

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drawn	HW
checked	CH
project no.	SD163-18
project phase	Construction Documentation

L.CD.202

012345M

LANDSCAPE DETAILS



7.3 REFERENCED LANDSCAPE SPECIFICATION

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Vegetation

R178

(h) be free of weed and weed refuse material.

HOLD POINT

Process Held:	Delivery of imported general purpose topsoil.
Submission Details:	At least 7 days prior to delivery, a statement signed by you verifying that the topsoil complies with specified requirements. The statement must quote test results and must certify that the topsoil is not contaminated topsoil.
Release of Hold Point:	The Principal will consider the submitted documents and may inspect the test records prior to authorising the release of the Hold Point.

2.2 HERBICIDE

Herbicides used must be currently registered for the treatment of weeds by the Australian Pesticides and Veterinary Medicines Authority (APVMA). Use herbicides in accordance with the manufacturer's directions supplied with the product. Herbicides must be glyphosate based unless otherwise required by the relevant local government authority.

Information on registered herbicides may be obtained from the APVMA Internet site www.apvma.gov.au.

2.3 SEED

All seed used must be of the species and varieties listed in Annexure R178/A.

~~You must supply~~ all seeds required, ~~unless stated otherwise in Annexure R178/A that locally collected native seed will be supplied by the Principal.~~

Note that there may be a lead time of up to two years for procurement of some native seed species.

Include in the PROJECT QUALITY PLAN the name/s of the proposed seed supplier/s. This information may be advised to the Principal as an addendum if it is not available when the Project Quality Plan is submitted. This addendum must be submitted prior to any seeding application.

The native seed must be delivered to the site in separate lots for each species and variety, clearly labelled to show species, variety and weight. Each seed species must be accompanied with a species identification certificate. Grass and clover seed must be pre-packed commercially with an accompanying certificate of germination as well as a certificate of authenticity. Where site conditions are not suitable for the pre-treatment and mixing of seed, this may be done off site and an accompanying certificate showing the species, variety, weight and place of treatment submitted to the Principal prior to seeding application.

Advise the Principal of the unavailability of any of the specified seed species at least six weeks in advance of sowing.

~~Locally collected native seed supplied by the Principal will be delivered to the site at no cost to the Contractor. Where this is the case, notify the Principal, in writing, at least five days prior to commencing vegetation of an area, so that the Principal can arrange supply of the locally collected native seed. This notification must indicate the location and area to be treated and the quantity of native seed required.~~

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Vegetation

R178

~~provide a wedge of topsoil on each step which is 30 mm to 70 mm deep against the vertical face at the back of the step.~~

On slopes which are 5 to 1 or flatter, cultivate the topsoiled area to a depth of 50 mm by a diamond harrow to provide a roughened surface with soil lumps not exceeding 50 mm dimension.

Place and lightly compact topsoil to the uniform thicknesses shown in the [landscape Drawings](#) and to avoid uneven settling. Topsoiled areas, when finished, must present smooth surfaces free of lumps of soil or stones and gradually blending into adjoining undisturbed ground.

Finish topsoil flush with adjacent to kerbs, footpaths, mowing strips or other hard paved surfaces unless otherwise specified or approved by the Principal.

Vary the route of vehicles and plant passing over newly scarified or topsoiled areas to avoid developing areas of excess compaction.

3.3 PREPARATION OF SEED

Where site conditions are not suitable for the pre-treatment and mixing of native and grass seed, this work may be done off site in conditions conducive for this purpose.

HOLD POINT

Process Held:	Use of seed pre-treated off site.
Submission Details:	At least 3 working days prior to delivery, submit the accompanying certificate showing the species, variety, weight and place of pre-treatment.
Release of Hold Point:	The Principal will consider the submitted documents and may inspect the seed prior to authorising the release of the Hold Point.

3.3.1 Pre-treatment to Assist Germination

Pre treat those seeds shown in Annexure R178/A as requiring pre-treatment to assist germination.

Where hot water is the specified pre-treatment, place the seed in a calico bag together with camphor granules as an insect repellent at the rate of 50 g per 10 litres of water. Immerse the bag in hot water with temperature of around 90°C for a minimum period of 60 minutes or the period specified in Annexure R178/A, whichever is the greater, and then remove from the water, drain and allow to dry. When dry, mix the treated seed with the remaining seed and broadcast when conditions are suitable.

Seed that has been pre-treated must be used within five days of pre-treatment.

Where proprietary products are used to assist germination, use as recommended by the manufacturer.

3.3.2 Preparation for Hydromulching, Hydroseeding and Straw Mulching

Storage tanks, containers and equipment to be used in hydromulching, hydroseeding and straw mulching must be clean and free of contamination from previous operations.

The hydromulch, hydroseed and straw mulch must comprise the relevant materials listed in Table R178.1 applied at the rates set out in Table R178.1.

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R178**Vegetation****Table R178.1 – Application Rates for Materials**

Material	Clause	Rate per Hectare
(a) Hydromulching		
(i) Water	2.5	35,000 litres
(ii) Organic fertiliser: pelletised poultry manure	2.4	250 kg
(iii) Seed	2.3	See Annexure R178/A
(iv) Cellulose fibre mulch: - Sugar cane mulch, mixed with 20% (by weight) of shredded paper or - Wood fibre mulch	2.6	3,500 kg 2,500 kg
(v) Binder: granulated 'Guar gum'	2.8	60 kg
(vi) Biodegradable green dye	2.9	As recommended
(b) Hydroseeding		
(i) Water	2.7	20,000 litres
(ii) Organic fertiliser: pelletised poultry manure	2.4	250 kg
(iii) Seed	2.3	See Annexure R178/A
(iv) Biodegradable green dye	2.9	As recommended
(c) Strawmulching		
(i) Straw	2.5	5,000 kg
(ii) Binder: - Undiluted residual bitumen emulsion or - Granulated 'Guar gum'	2.8	2,500 litres 100 kg

Produce hydromulch / hydroseed slurry mixtures by adding the specified materials into the tank and agitate until a homogenous blend is obtained. Refer to Annexure R178/D for the approximate number of loads required per hectare of spraying, for typical tank capacities, in order to achieve the specified rates in Table R178.1 and the minimum thickness of the sprayed layer specified in Clause 3.4.

3.4 SOWING**3.4.1 Sowing Methods**

Unless otherwise shown on the Drawings, sow areas with slopes of 5 to 1 or flatter, using one of the following methods:

- (a) dry sowing, in accordance with Clause 3.4.2; or
- (b) for small areas only, by hand.

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Vegetation

R178

Unless otherwise shown on the Drawings, sow areas with slopes steeper than 5 to 1 in any direction, using one of the following methods:

- (i) hydroseeding and straw mulching; or
- (ii) hydromulching; or
- (iii) for rock face batters, hydroseeding; or
- (iv) for small areas only, by hand.

Stepped batters must be topsoiled as described in Clause 3.2 and hydroseeded or hydromulched.

WITNESS POINT

Process Witnessed: Sowing

Submission Details: Notify the Principal, not less than 5 clear working days prior to the intended time of sowing, giving details of the area to be sown.

3.4.2 Dry Sowing

Undertake dry sowing using either:

- (a) a tractor drawn seed drill to place seed at a depth of 5 mm; or
- (b) a spreader followed immediately by a single pass with an unweighted diamond harrow.

Where practicable, tractor passes with the seed drill or harrow must follow finished surface contours. Distribute seed and fertiliser evenly over the areas to be sown at the rates specified in Annexure R178/A. Apply fertiliser concurrently with the seeding operation.

Gauge the application rate of the seed mix to ensure an even distribution over the areas sown, in accordance with the rates nominated in Annexure R178/A. Maintain records of measurements and calculations to determine actual distribution rates for each lot.

3.4.3 Hydromulching and Hydroseeding

Carry out hydromulching / hydroseeding within 2 days of completion of soil preparation or, if delayed by the weather conditions listed in Clause 3.4.5, as soon as weather conditions permit.

Agitate continuously the slurry to maintain a uniform consistency during application. Apply it uniformly over the whole surface at the rate specified in Table R178.1.

The sprayed hydromulch layer within 48 hours of application must have a minimum thickness at any location of 5 mm when using sugar cane mulch (mixed with shredded paper), or 2 mm when using wood fibre.

3.4.4 Straw Mulching

The straw mulch must comprise the materials and application rates set out in Table R178.1.

Apply the straw mulch uniformly using a purpose-made blower unit. Incorporate the emulsion as a spray into the air stream of the mulch blower or apply it in a separate operation within 12 hours from the application of straw mulch.

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R178**Vegetation**

The strawmulch layer within 48 hours of application must have a minimum thickness at any location of 25 mm.

3.4.5 Weather Conditions for Hydroseeding, Hydromulching and Straw Mulching

Do not apply hydroseeding, hydromulching and straw mulching:

- (a) when winds exceed 15 km/hr;
- (b) when temperatures exceed 37°C,
- (c) where the surface is too wet; or
- (d) during rain periods or when rain appears imminent.

3.5 SIGNPOSTING

Supply and install information signs approximately 1,500 x 600 mm stating "NATIVE PLANT REGENERATION AREA—PLEASE KEEP OFF", including the requisite posts, brackets and fittings, where shown on the Drawings or as directed by the Principal. Support each sign at a height of 1.5 metres on two 75 mm dia steel posts set in concrete 500 mm deep into the ground at a distance of 900 mm apart.

4 VEGETATION OF OPEN DRAINS**4.1 PREPARATION OF SURFACE**

Treat weed infestation in accordance with Clause 3.1 but without using herbicides.

Where shown on the Drawings or directed by the Principal, apply the following protective treatment immediately to all or part of the surface to be vegetated.

4.1.1 Lining with Organic Fibre Mesh

Where shown on landscape drawings, lay the runs of the mesh along the direction of water flow.

Slot the upstream end of the mesh into a trench 150 mm wide by 150 mm deep and pin the mesh to the base of the trench at 200 mm centres. Backfill the trench with soil and compact by foot.

Lay the mesh taut and evenly over the soil surface without any air pockets but do not stretch it.

Overlap adjacent runs of mesh by 100 mm with the higher run lapped over the lower.

Pin the mesh along the sides of each run at 500 mm centres and along the middle of each run at 1 m centres.

End overlaps must be 150 mm wide with the higher run end lapped over the start of the lower and pinned at 200 mm centres.

4.2 SOWING

~~Apply seed and fertiliser uniformly at the rates specified in Annexure R178/A by one of the following procedures, as shown on the Drawings or as directed by the Principal:~~

APPENDIX R

Flora and Fauna Management Plan



Western North South Link Road

Flora and Fauna Management Plan

Prepared for

Goodman Property Services (Aust.) Pty Ltd

Western North South Link Road - Flora and Fauna Management Plan

Document control

Approval and authorisation

Title	Western North South Link Road Flora and Fauna Management Plan
Prepared by	Kat Duchatel BSc. Env. CEnvP EIANZ #691 BAM Accreditation No.BAAS17054
Approved on behalf of Goodman by	[Insert name of Goodman project manager]
Signed	
Dated	
Approved on behalf of [Insert name of Construction Contractor] by	[Insert name of Construction Contractor project manager]
Signed	
Dated	

Document status

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02	08/07/2019	Amended following Client review	Goodman
03	10/07/2019	Amended to include BOS boundaries	Goodman
04	23/09/2019	Final FFMP - amended stamped conditions	Goodman
05	06/11/2019	Final FFMP - amended to incorporate DPIE comments	Goodman

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Glossary / Abbreviations

Abbreviations	Expanded text
BAR	Biodiversity Assessment Report
BC Act	NSW Biodiversity Conservation Act 2016
BCT	NSW Biodiversity Conservation Trust
BOS	Biodiversity Offset Strategy
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DoEE	Department of the Environment and Energy
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning Industry and Environment
EEC	Endangered Ecological Community
EES	NSW Department of Environment Energy and Science
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EWMS	Environmental Work Method Statements
FFMP	Flora and Fauna Management Plan
FM Act	NSW Fisheries Management Act 1994
MNES	Matters of National Environmental Significance
NATA	National Association of Testing Authorities, Australia
OEH	NSW Office of Environment and Heritage
PCA Act	NSW Prevention of Cruelty to Animals Act 1999
RMS	NSW Roads and Maritime Services
SSD	State Significant Development
WNSLR	Western North South Link Road

1 Introduction

1.1 Context

This Flora and Fauna Management Plan (FFMP) forms part of the Construction Environmental Management Plan (CEMP) developed for the construction of the Western North South Link Road (the Project). The Project is a component of the Oakdale West Estate State significant development (SSD7348) being developed by Goodman Property Services (Goodman) in Precinct 8 of the Western Sydney Employment Area (WSEA).

Approximately 1.3 km long, the Project will connect Oakdale West Estate (Oakdale West) via a bridge crossing over the WaterNSW Pipelines to Lenore Drive approximately 1km to the north.

The extent of the Project's construction footprint traverses land owned by Goodman (Oakdale West), WaterNSW and Fitzpatrick Investments (Fitzpatrick). Fitzpatrick land includes a section of the Erskine Park Biodiversity Corridor (see Figure 1-1). Consent for SSD7348 approves the removal of native vegetation from the Project alignment including that located within Oakdale West, WaterNSW land and the Erskine Park Biodiversity Conservation Area. Removal of native vegetation from Fitzpatrick land has been approved under a separate development application.

The Project is described and assessed in detail in the following Oakdale West SSD7348 documentation:

- Environmental Impact Statement (EIS) (Urbis, November 2017)
- Response to Submissions (RTS) (Urbis, May 2018)
- Supplementary RTS (Urbis, October 2018)
- Biodiversity Assessment Report (BAR) (Cumberland Ecology 2015, 2016, 2017; and écologique 2018)
- Biodiversity Offset Strategy (BOS) (Cumberland Ecology 2015, 2016, 2017; and écologique 2018)

Key aspects of the Project that could result in impacts to terrestrial flora and fauna include:

- Clearing of approximately 4.3 ha of native vegetation, which includes the loss of approximately 0.6 ha of low condition Cumberland Plain Woodland
- Clearing of potential fauna habitat
- Risk of introducing and/or spreading weeds and pathogens
- Disturbance of soils, consequential erosion and the mobilisation of sediment

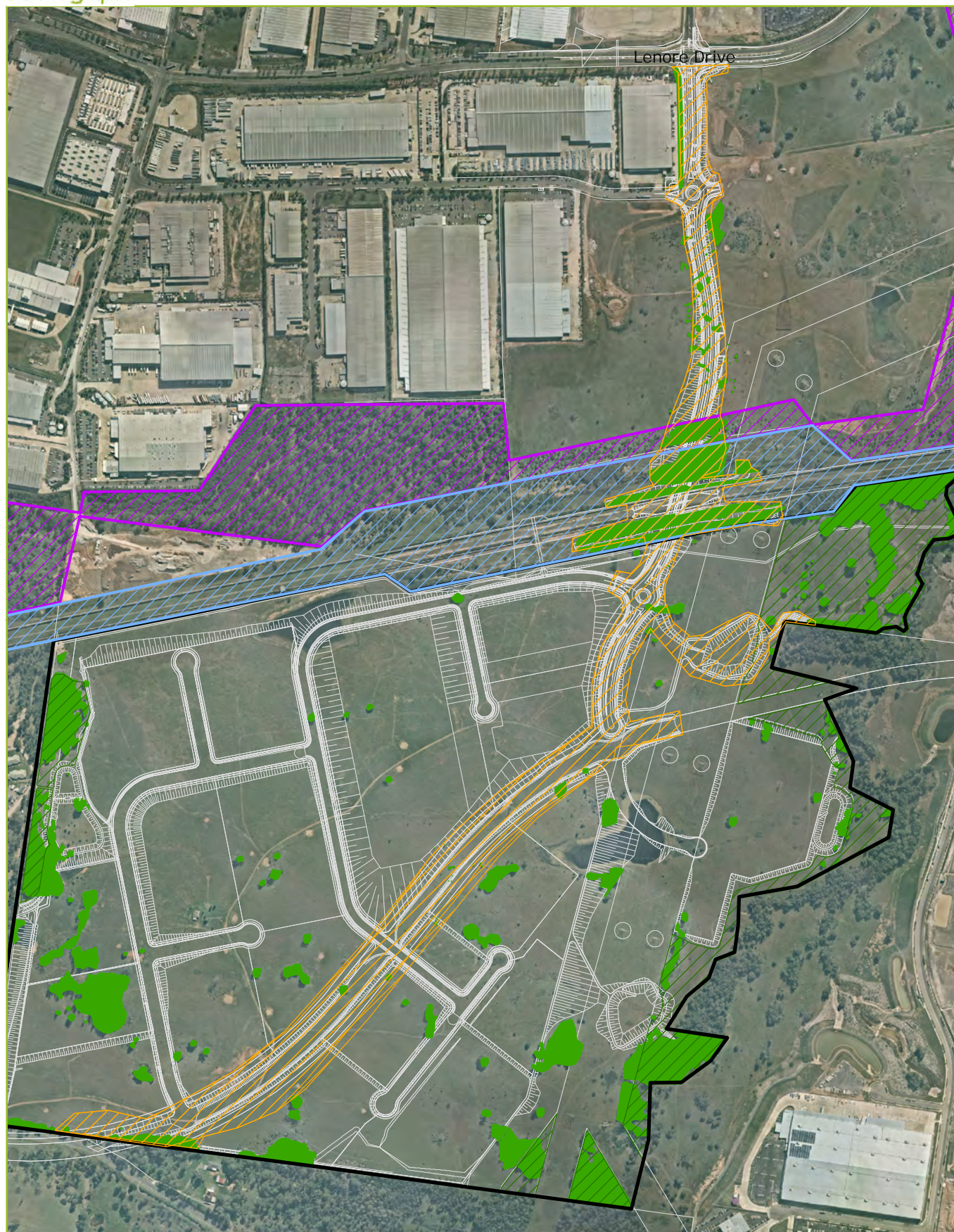
1.1 Purpose of the FFMP

As a subplan to the CEMP, this FFMP has been prepared to address the requirements of the SSD7348 consent conditions, relevant legislation, permits and approvals, which apply either wholly or partially to the construction of the Project.

The objective of this FFMP is to ensure implementation of all avoidance, minimisation, mitigation and management measures relevant to the protection of native flora and fauna, including endangered ecological communities and potential fauna habitat.

These objectives will be met through implementing the procedures described in this FFMP, which include:

- Pre-clearance, construction and post construction strategies
- Fauna rescue and relocation protocol
- Weed and pathogen control
- Unexpected finds protocol
- Monitoring and reporting strategies

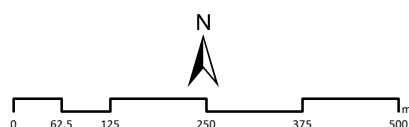


- Oakdale West Estate
- WaterNSW
- Erskine Park Biodiversity Corridor
- SSDA_WNSLR_indicative_works_extent
- Biodiversity offset areas
- Existing vegetation

WNSLR Flora & Fauna Management Plan

Figure 1-1 Extent of works

Coordinate System: MGA Zone 56 (GDA 94)
Image sources: Nearmap 7 April 2019



1.2 Consent conditions

SSD7348 consent conditions relevant to this FFMP are summarised in Table 1-1.

Table 1-1. Consent Conditions

Condition Requirement	Section/Comment
Flora and Fauna Management Plan	
D88. The Applicant must prepare a Flora and Fauna Management Plan (FFMP) for Stage 1, to the satisfaction of the Planning Secretary. The Plan must form part of a CEMP in accordance with Condition D119 and must:	Purpose of this FFMP
<ul style="list-style-type: none"> Be prepared by a suitably qualified and experienced person(s); 	FFMP author: Kathryn Duchatel BSc. Env. CEnvP EIANZ #691 BAM Accreditation No.BAAS17054 Industry experience: 20+years
<ul style="list-style-type: none"> Describe procedures to manage impacts on biodiversity values during earthworks, clearing and dam decommissioning; 	Refer Sections 4 and 5 of this FFMP
<ul style="list-style-type: none"> Include procedures for clearing marking and protecting the areas of vegetation to be retained on the Site, including the mature vegetation in the north-western corner and the Biodiversity Offset Area, established in accordance with Condition D91 adjacent to Ropes Creek; and 	Refer Section 4.1 and Appendix A of this FFMP
<ul style="list-style-type: none"> Detail the specific erosion and sediment controls to protect the retained vegetation. 	Refer Appendix A of this FFMP and the Project Progressive Erosion and Sediment Control Plan (ESCP).
D89. The Applicant must: <ul style="list-style-type: none"> Not commence bulk earthworks until the FFMP required by Condition D88 is approved by the Planning Secretary; and Implement the most recent version of the FFMP approved by the Planning Secretary for the duration of bulk earthworks and construction. 	Noted
Offsets for Stage 1	
D90. Within 12 months of the date of this development consent, or as otherwise agreed with the Planning Secretary, the Applicant must retire 172 ecosystem credits to offset the removal of 4.41 hectares of native vegetation on the Site.	Completed in: Biodiversity Assessment Report (BAR); and Biodiversity Offset Strategy (BOS)
D91. The Applicant shall establish a Biodiversity Offset Area on the Site, consistent with the area described in the RTS, in	Completed in BOS

Condition Requirement	Section/Comment
accordance with a Biodiversity Stewardship Agreement with the Biodiversity Conservation Trust.	
Biodiversity Management Action Plan	
D92. The Applicant must maintain the Biodiversity Offset Area on the Site in accordance with a Biodiversity Management Action Plan approved by the Biodiversity Conservation Trust (BCT).	To be completed in consultation with the BCT.
Offsets for WNSLR	
D93. Within 12 months of the date of this development consent, or as otherwise agreed with the Planning Secretary, the Applicant must:	To be completed in consultation with the Planning Ministerial Corporation.
<ul style="list-style-type: none">Offset 0.42ha of vegetation lost in the Erksine Park Biodiversity Corridor as a result of the WNSLR by carrying out planting within the area shown in the green edging on Figure 9 (Appendix 6 of consent conditions)	
<ul style="list-style-type: none">Plant the areas shown in the green edging on Figure 9 (Appendix 6 of consent conditions) with species similar to those identified for zone 4a, on the south-eastern side of Ropes Creek, in the Biodiversity Management Plan Erskine Park Employment Area (HLA-Envirosciences, 2 May 2006)	
D94. The Applicant shall monitor and maintain the planting for a period of six months to ensure a minimum 85% survival rate of the planting.	
D95. The Applicant must notify the Planning Ministerial Corporation at least one month before the completion of planting to enable the Planning Ministerial Corporation to arrange ongoing maintenance.	
Snake Management Measurements	
D96. Prior to construction of Stage 1, the Applicant must implement snake management measures to limit, to the extent practicable, movement of snakes from the Site into the adjacent school and retirement village on the western boundary of the Site.	Completed in Oakdale West FFMP
The measures shall be detailed in the CEMP required by Condition D119 and shall include, but not be limited to, provision of alternative snake habitat on Site, fencing along the western boundary and installation of snake deterrents.	

Condition Requirement	Section/Comment
Construction Environmental Management Plan	
<p>D119. The Applicant must prepare a Construction Environmental Management Plan (CEMP) for Stage 1, including the WNSLR, in accordance with the requirements of Condition D118 and to the satisfaction of the Planning Secretary.</p> <p>D118. Management plans required under this development consent must be prepared in accordance with relevant guidelines, and include:</p>	
<p>Details of:</p> <ul style="list-style-type: none"> The relevant statutory requirements (including any relevant approval, licence or lease conditions); Any relevant limits or performance measures and criteria; and The specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; 	<p>Refer Section 2 of this FFMP; and</p> <p>Refer Section 6 of this FFMP</p>
A description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Refer Section 4 and Table 4-1 of this FFMP
<p>A program to monitor and report on the:</p> <ul style="list-style-type: none"> Impacts and environmental performance of Stage 1; and Effectiveness of the management measures set out pursuant to paragraph (b) above; 	Refer Section 6 of this FFMP
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;	Refer Section 7 of this FFMP
A program to investigate and implement ways to improve the environmental performance of Stage 1 over time;	External to this FFMP. Completed in CEMP
<p>A protocol for managing and reporting any:</p> <ul style="list-style-type: none"> Incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); Complaint; Failure to comply with statutory requirements; and A protocol for periodic review of the plan 	External to this FFMP. Completed in CEMP

2 Relevant Legislation and Guidelines

2.1 Relevant Legislation

Specific legislation relevant to this FFMP includes:

- *Biodiversity Conservation Act 2016*
- *Biosecurity Act 2015*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Fisheries Management Act 1994*
- *Pesticides Act 1999*
- *Prevention of Cruelty to Animals Act 1979*

2.1.1 Biodiversity Conservation Act 2016

Impacts on threatened flora and fauna species, populations and ecological communities are administered by the NSW Environment Minister under the *Biodiversity Conservation Act 2016* (BC Act).

Native vegetation that will be cleared for the construction of the Project has been assessed under the NSW Biodiversity Offset Scheme and approved under SSD7348. Areas of native vegetation to be retained, including threatened ecological communities that are being managed within biodiversity offset areas (BOA) in accordance with the Oakdale West Biodiversity Offset Strategy (BOS) see Figure 3-1, are to be appropriately demarcated and protected (refer Section 4, Figure 3-1 and Appendix A of this FFMP).

2.1.2 Biosecurity Act 2015

The *Biosecurity Act 2015* commenced on 1st July 2017 at which time the *Noxious Weeds Act 1993* was wholly repealed and the *Fisheries Management Act 1994* (Aquatic Biosecurity) partly repealed.

The Greater Sydney Regional Strategic Weed Management Plan 2017-2022 identifies both State level and regionally determined priority weeds and high risk activities. Priority weeds relevant to the WNSLR construction area are identified in Section 4.3 - Table 4-2.

2.1.3 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the Australian Government's central piece of environmental legislation. The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places—defined in the EPBC Act as matters of national environmental significance (MNES).

A referral submitted to the Australian Government under SSD7348 relating to vegetation communities within Oakdale West (defined as MNES). The MNES were assessed as a controlled action under the EPBC Act but approved for assessment under a bilateral agreement with the NSW government.

Areas containing MNES to be retained, including threatened ecological communities, are to be appropriately demarcated and protected (refer Section 4 and Appendix A of this FFMP).

2.1.4 Fisheries Management Act 1994

The rescue and relocation of fin fish during dam decommissioning requires a permit under Section 37 of the *Fisheries Management Act 1994* (FM Act).

The power to grant an approval under Section 37 of the FM Act is limited by section 220ZW (Licence to harm threatened species, population or ecological community or damage habitat).

On the basis of biodiversity surveys conducted for the SSD7348 no threatened species, population or ecological communities listed under the FM Act occur within the Project works extent and a licence under section 220ZW not required.

2.1.5 Pesticides Act 1999

The *Pesticides Act 1999* controls the use of pesticides in NSW. It aims to reduce risks to human health, the environment, property, industry and trade, and promote collaborative and integrated policies for pesticide use. Under this Act, all pesticide users in NSW must:

- Only use pesticides registered or permitted by the Australian Pesticides and Veterinary Medicines Authority (APVMA)
- Obtain an APVMA permit if they wish to use a pesticide in a way not covered by the label
- Read the approved label and/or APVMA permit for the pesticide product (or have the label/permit read to them) and strictly follow their directions
- Only keep registered pesticides in containers bearing an approved label
- Prevent injury to people, damage to property and harm to non-target plants and animals from using a pesticide

2.1.6 Prevention of Cruelty to Animals Act 1979

Consultation with the Department of Primary Industries (DPI) and Secretary of the Animal Care and Ethics Committee (ACEC) has confirmed animal relocation, or in some cases euthanasia, does not require animal ethics approval as it is being performed under animal management practices and does not fit under the definition of animal research under the *Animal Research Act 1985*.

Instead, the legislation pertaining to this activity is the *Prevention of Cruelty to Animals Act 1979* (PCA Act). For this reason an Animal Research Authority (ARA) is not required for the relocation of any terrestrial or aquatic fauna that may result from either clearing of native vegetation or dam decommissioning during the construction of the WNSLR.

Under this Act Part 2 Clause 5(3), a person in charge of an animal shall not fail at any time:

- a. to exercise reasonable care, control or supervision of an animal to prevent the commission of an act of cruelty upon the animal,
- b. where pain is being inflicted upon the animal, to take such reasonable steps as are necessary to alleviate the pain, or
- c. where it is necessary for the animal to be provided with veterinary treatment, whether or not over a period of time, to provide it with that treatment.

These clauses have been provisioned for in Section 4.2 of this FFMP.

2.2 Guidelines

The Project is being constructed in accordance with NSW Roads and Maritime Services (RMS) specifications. RMS and other specifications and policies relevant to this FFMP include:

- RMS QA Specification G36 - Environmental Protection
- RMS QA Specification G40- Clearing and Grubbing
- RMS Biodiversity Guidelines (September 2011)
- Australian Standard AS 4373 Pruning of Amenity Trees
- Australian Standard 4970 - 2009 Protection of Trees

3 Existing Environment

The following sections summarise existing flora and fauna within and adjacent to the Project area including species, communities and habitats. The key reference documents are: the EIS (Urbis 2017); RTS (Urbis 2017); supplementary RTS (Urbis 2018); the BAR (écologique 2018) and BOS (écologique 2018).

The extent of native vegetation as relevant to the Project area is shown on Figure 3-1.

3.1 Vegetation

The Project area is mostly cleared pasture dominated by exotic pasture grasses. Native vegetation is relatively limited, occurring as small remnant patches, sparsely scattered trees and shrubs, regenerating (or derived woodland) and plantings associated with rehabilitation works and landscaping.

The extent of the Project's construction footprint traverses land owned by Fitzpatrick Investments (Fitzpatrick), WaterNSW and Goodman (Oakdale West) as shown Figure 1-1.

All developable Fitzpatrick land (including the Project) was the subject of a separate planning assessment and approval, which conditioned offsetting of native vegetation clearing through the creation of the Erskine Park Biodiversity Corridor (refer Section 3.1.2).

The removal of native vegetation from the Erskine Park Biodiversity Corridor, WaterNSW land and Oakdale West is permissible under SSD7348 approval.

Native vegetation that will be cleared as a result of the Project is discussed below as relevant to tenure and land management.

3.1.1 Fitzpatrick land

Fitzpatrick land extends from Lenore Drive at the northern extent of the Project area to boundary of WaterNSW land to the south, including the Erskine Park Biodiversity Corridor (the Biodiversity Corridor). Most of this land is cleared pasture. Excluding the Biodiversity Corridor (see Section 3.1.2 and Figure 3-1), native vegetation that will be removed for the Project comprises the following:

- Approximately 0.2 ha of landscaping, which provides screening alongside existing development located between Lenore Drive and Lockwood Road. Up to 21 trees and groundcovers were planted around 10 years ago and prior to the construction of Lenore Drive; and
- Scattered small patches of shrubby regrowth and isolated larger paddock trees.

As the existing Fitzpatrick development approval permits the clearing of native vegetation, protection measures specified in this FFMP will only apply to areas of native vegetation that are not investigated during pre-clearance surveys and cleared for absence of native fauna (refer Section 4.1).

3.1.2 Erskine Park Biodiversity Conservation Corridor

The Biodiversity Corridor comprises the allocation of land and the protection and revegetation of areas to create a continuous east-west biodiversity corridor between South Creek and Ropes Creek through the Erskine Park Employment Area.

Within the Project area, the Biodiversity Corridor comprises relatively juvenile planted native tree and large shrub species and an understorey dominated by exotic grasses. Approximately 0.42 ha of planted native vegetation will be cleared for the Project.

Surrounding native vegetation that will not be cleared as a result of the Project includes the following:

- Juvenile planted native trees and large shrub species to the west (similar to that within the Project's construction footprint;
- Planted native groundcovers due to the requirements to managed vegetation beneath the Transgrid electricity easement;

- Derived woodland on WaterNSW land to the south and that which is approved for clearing; and
- Cleared pasture-land on Fitzpatrick land to the north.

Protection measures specified in this FFMP (refer Appendix A) will apply to the areas of planted native vegetation immediately east and west of the Project's construction footprint.

3.1.3 WaterNSW land

Existing vegetation on WaterNSW land is dominated by dense and relatively immature growth of *Casuarina glauca* (Swamp Oak), which has established on unconsolidated soils and steep embankments located either side of the Warragamba Pipelines. This vegetation was not considered to represent any defined plant community type and is herein referred to as derived woodland.

Approximately 2.58 ha of derived woodland within WaterNSW land will be cleared for the Project.

Surrounding native vegetation that will not be cleared as a result of the Project comprises derived woodland similar to that being cleared.

Protection measures specified in this FFMP will only apply to areas of native vegetation that are not investigated during pre-clearance surveys and cleared for absence of native fauna (refer Section 4.1 and Appendix A).

3.1.4 Oakdale West

Most of the Project's construction footprint within Oakdale West comprises pasture with sparsely scattered and small patches of remnant woodland and isolated paddock trees.

Approximately 0.62 ha of remnant woodland will be cleared for the Project, which includes plant community types listed under either or both of the BC Act and EPBC Act (refer Section 3.1.5).

Native vegetation that will not be cleared as a result of the Project include remnant woodland and isolated trees (predominantly located within the Oakdale West Biodiversity Offset Area) as shown in Figure 3-1.

These areas require protection measures as specified in this FFMP.

A small farm dam will require decommissioning for the Project. Dam decommissioning requirements are specified in Section 5 of this FFMP.

3.1.5 Threatened Ecological Communities

Four plant community types (PCTs) have been identified within Oakdale West, each of which are listed as threatened ecological communities under either or both of the BC Act and EPBC Act (Table 3-1 and Figure 3-1).

Table 3-1. Threatened Ecological Communities

ID	PCT common name, (former biometric vegetation type code): EEC name	Status	
		BC Act	EPBC Act
PCT 835	Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion, (HN526): River-flat Eucalypt Forest (RFEF)	Endangered	Not listed
PCT 849	Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion, (HN528): Cumberland Plain Woodland (CPW on flats)	Critically endangered	Critically endangered
PCT 850	Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion, (HN529): Cumberland Plain Woodland (CPW on shale)	Critically endangered	Critically endangered
PCT 1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion, (HN594): Swamp Oak Floodplain Forest (SOFF)	Endangered	Endangered

Direct impacts on all vegetation within the Project area are being offset under SSD7348 consent conditions. Indirect impacts (such as, but not limited to: the introduction or spread of weeds and pathogens; clearing or damage to native vegetation to be retained; and sedimentation delivered in site runoff) are addressed in the control measures specified in this FFMP and the Project's CEMP.

Of the PCTs listed in Table 3-1, only PCT 849 will be cleared as a result of the Project, with PCT 849 and PCT 1232 requiring protection measures specified in this FFMP (refer Appendix A).

3.1.6 Threatened Flora Species

Relevant biodiversity assessments have concluded that the Project area is unlikely to contain, or provide habitat for, threatened flora species, with the exception of *Grevillea juniperina* subsp. *juniperina* (Juniper-leaved Grevillea).

The removal of Juniper-leaved Grevillea is permissible under existing development approval on Fitzpatrick land. This species does not occur within the remainder of the Project area.

Notwithstanding pre-clearance surveys shall target this and other threatened species that have a remote potential to occur within the Project area (see Table 3-2).

Table 3-2. Threatened flora species

Scientific name	BC Act	EPBC Act
<i>Dillwynia tenuifolia</i>	Vulnerable	-
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>	Endangered Population	-
<i>Pimelea spicata</i>	Endangered	Endangered

Scientific name	BC Act	EPBC Act
<i>Pultenaea parviflora</i>	Vulnerable	Endangered

3.2 Fauna Habitat

The Project area is highly disturbed by activities associated with cattle grazing and forms mostly degraded and unsuitable habitat for many native fauna species. Fauna habitat types identified during biodiversity investigations are listed in Table 3-3.

Table 3-3. Fauna habitat within the Project area

Name	Habitat features
Landscaped planting	Forage habitat for nectivorous species during flowering seasons.
Paddock trees	Several mature eucalypts have been retained within paddocks, which may provide foraging and refuge habitat for transient birds and mammals.
Dead standing trees (stags)	A number of stags containing hollows occur within or adjacent to the Project area. Hollows have been observed to be used by Red-rumped Parrots (<i>Psephotus haematonotus</i>).
Aquatic Habitat	Farm dam providing habitat for fin fish (short finned eels), amphibians, reptiles (turtles and snakes) and wetland birds.
Grassland Habitat	Grassland habitats comprise the majority of the available habitat at the development site. Grassland habitats are devoid of logs, rocks, caves and outcrops, and are more suited to grazing macropods and introduced herbivores. Grassland habitat across the development site is relatively uniform with no features such as burrows observed during site inspections.

3.2.1 Threatened fauna

No threatened fauna species were identified during biodiversity investigations undertaken and assessments concluded that threatened species are unlikely to occur in the Project area due to a lack of suitable habitat and breeding resources.



- | | |
|-------------------------------|-----------------------|
| WNSLR_indicative_works_extent | PCT 849, CPW on flats |
| Farm dams | PCT 850, CPW on shale |
| Biodiversity offset areas | PCT 835, RFEF |
| OWE to remove | PT 1232, SOFF |
| WNSLR to remove | Derived woodland |
| | Landscaping |
| | Paddock shrubs_trees |

WNSLR FFMP

Figure 3-1 Native vegetation

Coordinate System: MGA Zone 56 (GDA 94)
Image sources: Nearmap 7 April 2019

4 Mitigation Measures

The mitigation measures and statutory requirements relevant to this FFMP are listed in **Table 4-1** below.

Table 4-1: Flora and fauna management and mitigation measures

ID	Measure/Requirement	Responsibility	Timing / Frequency	Reference / Notes
[GENERAL]				
FF1	All employees and contractors will be inducted to ensure that procedures outlined in this FFMP are met. This will have a focus on no-go zones, clearing limits and compliance with statutory requirements applicable to flora and fauna.	Management / Contractors / Employees	Prior to commencing work on site	Provisions under the BC Act, Biosecurity Act, FM Act, PCA Act Pesticides Act and best practice.
[VEGETATION CLEARING, PROTECTION AND MANAGEMENT]				
FF2	Pre-clearing surveys are to be undertaken immediately prior to clearing works by an experienced ecologist. Habitat features that will be cleared are to be appropriately marked and located by GPS.	Management / Project Ecologist	Pre-clearance	FFMP Section 4.1 and Appendix A RMS Biodiversity Guide 1: Pre-clearing process

ID	Measure/Requirement	Responsibility	Timing / Frequency	Reference / Notes
FF3	Pre-clearance reporting (including GPS measurements and FFMP constraints mapping) must be prepared to inform the following: Clearing limits, no-go zones, and areas that must be protected; Habitat features within clearing limits that require two-stage felling; and Amendments required to the Project's CEMP.	Management / Project Ecologist	Pre-clearance	FFMP Section 6 RMS Biodiversity Guide 2: Exclusion zones
FF4	Environmentally sensitive areas are to be fenced and habitat features that will be felled are to appropriately marked.	Management / Project Ecologist / Construction Contractor	Pre-clearance	FFMP Appendix A RMS Biodiversity Guide 2: Exclusion zones
FF5	Clearing of vegetation is to be in accordance with RMS QA Specification G40 Clearing and Grubbing.	Management / Construction Contractor	Pre-clearance	RMS QA Specification G40 Clearing and Grubbing
FF6	Clearing of vegetation and/or removal of bushrock does not go beyond the approved clearing limits for the project.	Management / Construction Contractor	Ongoing throughout construction	RMS Biodiversity Guide 4: Clearing of vegetation and removal of bushrock

ID	Measure/Requirement	Responsibility	Timing / Frequency	Reference / Notes
[SEDIMENT AND EROSION CONTROLS]				
FF7	Sediment and erosion controls must be installed prior to any earthworks required and maintained for the duration of the works.	Management / Contractors	Pre-clearance/ ongoing throughout construction	FFMP Section 4.1.3 CEMP Progressive Erosion and Sediment Control Plan (PESCP)
[WILDLIFE PROTECTION]				
FF8	The pre-clearing process is completed before any clearing begins.	Management / Project Ecologist / Construction Contractor	Pre-clearance	FFMP Section 4.2 RMS Biodiversity Guide 1: Pre-clearing process
FF9	An ecologist is to be present for all felling of identified habitat features.	Management / Project Ecologist	Ongoing throughout construction	FFMP Section 4.1
FF10	Fauna rescue and release protocols will be followed to ensure native fauna are not impacted during construction.	Management / Project Ecologist	Ongoing throughout construction	FFMP Section 4.2
FF11	Should unexpected threatened flora or fauna be encountered on site, a stop works procedure must be followed.	Management / Contractors / Employees	Ongoing throughout construction	FFMP Section 4.6 RMS Biodiversity Guide 9: Fauna handling
[WEED AND PATHOGEN MANAGEMENT]				

ID	Measure/Requirement	Responsibility	Timing / Frequency	Reference / Notes
FF12	Declared priority weeds are to be managed according to requirements of the Biosecurity Act. Use of herbicides must be undertaken in accordance with the requirements of the Pesticides Act 1999.	Management / Contractors	Pre-clearance/ ongoing throughout construction	FFMP Section 4.3 RMS Biodiversity Guide 6: Weed management
FF13	Hygiene procedures are to be implemented to avoid the introduction and/or spread of soil borne pathogens.	Management / Contractors / Employees	Ongoing throughout construction	FFMP Section 4.4 RMS Biodiversity Guide 7: Pathogen mitigation

4.1 Pre-clearance Process

4.1.1 Pre-clearance surveys

Pre-clearance surveys are undertaken to provide a final check for presence of flora and fauna species and habitat on a site immediately before clearing begins. Pre-clearance surveys are required to:

- Identify habitat features suitable for native fauna that will require clear felling supervision and which will require a two-stage clearance procedure (refer Section 5.4);
- Identify areas of high priority weeds requiring specific controls (refer Section 3.4);
- Identify any threatened flora or fauna that may have moved into the Project area since ecological surveys were conducted;
- Provide input into determining appropriate exclusion zones; through
 - Recording the details for all habitat features found in vegetation to be cleared (including where applicable: GPS location; species or type of habitat feature)
 - Marking the limits of clearing, habitat features in areas to be cleared and native vegetation to be protected during construction, using suitable methods
- Locate nearby habitat suitable for the release of fauna that may be encountered during the pre-clearing process or habitat removal;
- Locate suitable areas for relocation of habitat features (e.g. large woody debris, bush rock);
- Prepare constraints mapping and relevant induction materials;
- Determine any additional management measures that may need to be incorporated into the CEMP.

4.1.2 Marking limits of vegetation clearing

Prior to any clearing being undertaken within the Project area, the edge of the vegetation to be cleared needs to be clearly delineated. Clearing limits can be marked with high visibility tape, temporary fencing, or other appropriate boundary markers.

To avoid unnecessary damage to adjacent vegetation or inadvertent habitat removal, disturbance is to be restricted to the delineated area. No stockpiling of equipment, soils, or machinery will occur beyond the boundary.

The Contractor responsible for the clearance activities will be responsible for ensuring that the boundary markers are installed.

Materials and methods of marking trees to be removed or retained and protected will be agreed to prior to their employment. This will ensure there is no overlap with methods used by various Project contractors and that vegetation to be cleared, habitat features to be cleared, and vegetation to be retained and protected, are clearly identifiable.

Generally to minimise confusion over growing amounts of flagging tape generated by different surveys and the marking of environmental sensitive areas, certain colours will be used for specific purposes. The following colour coding system is an example of what could be used for this Project:

- Flagging tape and signage - indicates areas or trees to be protected;
- Green = individual trees to be retained and sensitive areas close to and/or adjoining the construction zone; and
- Red = habitat trees to be cleared.

On completion of pre-clearance surveys and marking, this information will be transferred to constraints mapping for use in site inductions and GPS measurements will be provided for use by contractors.

Appendix A details the methods that must be adhered to during a pre-clearance assessment.

4.1.3 Sediment and Erosion Control

Sediment and erosion control measures are to be installed prior to earthworks and maintained for the duration of the works in accordance with the Project's Progressive Erosion and Sediment Control Plan (PESCP) and CEMP.

Vegetation removal

Specific controls required during vegetation removal include:

- Where vegetation removal is limited to isolated trees and shrubs, the tree/shrub removed shall have the root base backfilled and compacted as required;
- Vegetation in proximity to the Ropes Creek riparian zone and biodiversity management areas shall be cut at the base with the root structure to remain in place until earthworks stage;
- Grass shall be retained as long as practical along boundaries, which are to convey channelised flows;
- During the process of vegetation clearing, a control bund of cleared vegetation shall be maintained to control run-off as works progress;
- Boundary sediment controls shall be installed as soon as practical as the clearing front advances.

Protection of retained vegetation

Specific controls required to protect retained vegetation and biodiversity management areas include:

- Prior to soil disturbance, appropriate boundary sediment controls (sediment fencing, excavated sediment traps, check dams, straw bale filters, etc) shall be installed around all biodiversity management areas and other isolated areas of remnant vegetation to be retained;
- Stockpiles are not to be placed within no-go zones and shall be located at least five metres from existing vegetation, concentrated water flow areas, roads and hazard areas. Stockpiles shall be less than two metres in height, wherever possible. Where stockpiles are to be in place for more than ten days, they shall be stabilised to reduce the C-factor to less than 0.10;
- Earth banks are to be constructed on the upslope side to divert water around stockpiles and sediment fences one to two metres downslope (see Figure 4-1).

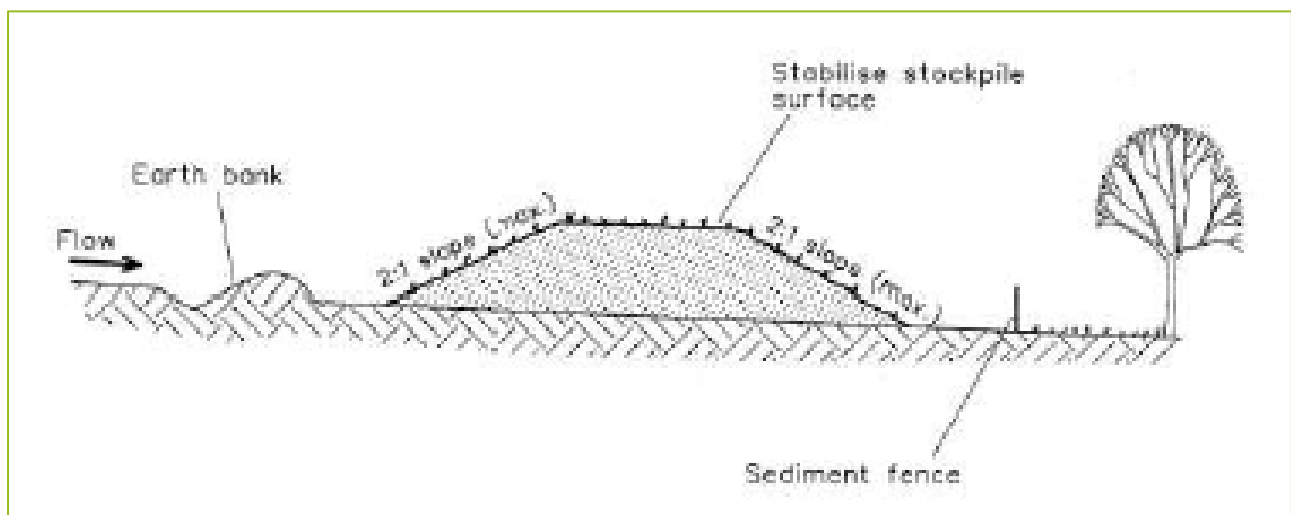


Figure 4-1. Stockpile controls schematic

4.1.4 Construction

During construction, an experienced ecologist must be present for the clearing of any habitat features previously identified.

4.1.5 Post-construction

Following clearing, a post-clearing assessment will be prepared and must include at minimum the following results:

- Details of native fauna captured and relocated, injured or deceased
- Photos of rescued fauna
- Number of habitat features felled
- Analysis of the effectiveness of clearing and fauna rescue methods
- Details of any woody debris, bushrock or hollow bearing trees that have been retained for habitat

4.2 Fauna Rescue and Release Procedure

All fauna handling and relocation shall be undertaken in accordance with this procedure to ensure that impacts upon native fauna are minimised for the duration of clearing works.

Employment of the procedure will assist in natural relocation of fauna that occupy the habitat features identified within the Project boundary, and where required handling and relocation.

4.2.1 Fauna Handling Protocol

Ecologists are responsible for capturing vertebrate fauna during the habitat clearing process. Fauna handling is to be only undertaken by the experienced ecologist on site or licenced wildlife carer.

All fauna that are encountered during clearance works are to be identified and assessed by an ecologist with records of their health status detailed (e.g. released, self-relocated, transported to vet or as per Wires).

The acting ecologists must operate under the following:

- Scientific Licence under Part 2 of the BC Act; and
- Compliance with the PCA Act.

The following procedure is relevant to the rescue/relocation and transport of fauna, instances where fauna is shocked, trapped, injured, or if eggs or juvenile fauna are discovered.

1. Stop work if encountering any fauna within work area
2. If fauna is not injured allow it to move out of work area
3. If fauna does not move out of work area due to injury or other reasons, the health of the animal must be determined and the decision based on the welfare of the animal and whether it is likely to survive on release. Stress would be minimised through:
 - The use of soft containment and placement in a pet carrier or similar,
 - Animal retained in a quiet, warm location that is well ventilated, and
 - Relevant vet/rescue agency contacted.
- Once the vet/rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the vet/rescue agency.
- In the event the local veterinary service and/or rescue service cannot attend the site, the injured/captured animal will be transported to their location.

4.2.2 Fauna Release Location

A suitable release location must be identified and when needed, injured animals will be assessed by a licensed ecologist and taken to a vet for further treatment if required. The vets nearest to the Project site include:

- St Clair Animal Hospital: 1 Olliver Crescent, St Clair. Tel: 02 9670 4955 (Mon-Fri 9am-7pm)
- Colyton Veterinary Hospital: 81 Great Western Hwy, Oxley Park. Tel: 02 9673 1106 (Mon-Fri 8am-7pm) (emergency/after-hours: 0409 291 189)

The location of where each fauna species that is released must also be recorded.

4.3 Weed Management and Mitigation Measures

Protocols for weed management, where applicable, are to be followed as per the RMS Biodiversity Guidelines (Guide 6) and RMS QA Specification G40 Clearing and Grubbing.

4.3.1 Weed control

The following methods are to be considered:

- Hand removal and other minimal impact techniques should be the first preference where practical
- Where manual or mechanical removal is not feasible, treat weed infestations in accordance with the herbicide specific to each species
- Herbicide application is to be administered by authorised personnel only (ChemCert Accreditation AQF 3), in accordance with Workcover requirements, the Pesticides Act 1999, other relevant legislation, label directions and any relevant industry codes of practice
- Where weeds cannot be effectively destroyed prior to topsoil stripping, contaminated topsoil will be isolated and either sterilised, encapsulated by deep burying, or disposed of at an approved off-site facility
- Weeds are to be segregated and bagged (where possible) when disposing off site. Transport must be covered to further reduce the potential for spread of weed propagules

4.3.2 Mitigation measures

The following mitigation measures shall be implemented to ensure that the contractor's biosecurity duty is fulfilled and spread of existing weeds or introduction of new weed infestations is prevented.

- The re-use of topsoil and mulch from areas on site should be guided by constraints mapping prepared following pre-clearance surveys
- Mulch or soils generated from locations that contain high-risk weeds such as those listed in Table 4-2 should not be reused on the Project site buried away from any pavement, structure, watercourse or drainage path and covered with fill (free of weeds) of a minimum 500 mm compacted thickness
- Hygiene protocols should be implemented to ensure that plant and machinery enter / leave the site clean to prevent the spread of weed species
- Monitoring of the site and general surrounds for weed infestations should be undertaken during the Project

4.3.3 Priority Weeds

The Greater Sydney Regional Strategic Weed Management Plan 2017-2022 identifies both State level and regionally determined priority weeds and high-risk activities. Priority weeds identified in the Project area during pre-clearance surveys must be shown on FFMP constraints mapping. Priority weeds identified during biodiversity assessments for SSD7348 are identified in Table 4-2.

Table 4-2. Priority weeds known to occur in the Project boundary

Species	Biosecurity Duty	Risk /Management
Woody weeds		
<i>Olea europaea</i> subsp. <i>cuspidata</i> African Olive	Regional - Containment	High risk* - should not be chipped /mulched or reused on site
<i>Rubus fruticosus</i> Blackberry	State asset protection	
<i>Senna pendula</i> var. <i>glabrata</i> Cassia	Regional asset protection	
Groundlayer/Vines		
<i>Araujia sericifera</i> Moth Vine	Regional asset protection	High risk - dispose of offsite
<i>Asparagus aethiopicus</i> Ground Asparagus	State asset protection	
<i>Asparagus asparagoides</i> Bridal Creeper	State asset protection	
<i>Bryophyllum delagoense</i> Mother of Millions	Regional asset protection	
<i>Chloris gayana</i> Rhodes Grass	Regional asset protection	Low risk
<i>Eragrostis curvula</i> African Lovegrass	Regional asset protection	Low risk
<i>Pennisetum clandestinum</i> Kikuyu	Regional asset protection	Low risk
<i>Senecio madagascariensis</i> Fire Weed	State - asset protection	Low risk

4.4 Pathogen Control

Protocols for pathogen control, where applicable, are to be followed as per the RMS Biodiversity Guidelines (Guide 7) and RMS QA Specification G40 Clearing and Grubbing.

4.4.1 Risk of Pathogens on site

Biodiversity assessments undertaken for SSD7348 did not identify evidence of any pathogens of concern within the project area, in particular:

- Phytophthora die-back (*Phytophthora cinnamomi*) - a soil borne pathogen that spreads in plant roots in warm, moist conditions. The pathogen appears to be widespread in coastal forests but may also occur at higher elevations. *P. cinnamomi* infects a large range of species. Susceptible species display a range of symptoms; some are killed, some are damaged but endure, and some show no apparent symptoms. The pathogen lives in soil and plant material therefore it is possible to be spread throughout the project area by construction machinery, boots and drainage waters.

LOW RISK: it is considered unlikely that *Phytophthora* would be present as species that are susceptible to this pathogen are not present in the project area. Regardless, hygiene procedures must be implemented throughout all stages of construction.

- Myrtle rust (*Puccinia psidii*) - a fungal disease which infects plants in the Myrtaceae family (eucalyptus, turpentine, bottlebrush, paperbark, tea tree and lilly pilly). Myrtle rust spreads naturally by wind, water, insects and animals. Myrtle rust spores can also spread over long distances if carried on infected plant material, contaminated equipment, vehicles and clothing.

LOW RISK: no symptoms of infection by Myrtle rust were evident during preclearing inspections. Regardless, hygiene procedures must be implemented throughout all stages of construction.

- Chytrid fungus - attacks keratin in frog's skin, which results in breathing difficulties. The fungus also damages the nervous system, affecting the frog's behaviour. Chytrid fungus may be spread on footwear and vehicle tyres and could be spread by construction activities.

MODERATE RISK: there are several farm dams within the wider development area which will be decommissioned over time and amphibians found would be relocated to Ropes Creek. The risk of introducing and spreading the fungus (through the movement of vehicles and plant from sites where this fungus may be present) is therefore possible.

As such, hygiene procedures for construction plant must be implemented throughout all stages of construction.

4.4.2 Mitigation Measures

- Minimise work during wet/rainy periods
- Vehicles, plant and machinery are to be clean and free of soil when arriving and departing the project area
- Truck wash down, rumble grids to be installed and operated to ensure mud, weeds or pathogens are not transported around the region or onto roads
- Ensure wheels, bodies and undercarriage of vehicles are washed thoroughly before travelling on public roads
- Mud spilt on roads to be immediately removed by a road sweeper

4.5 Large Woody Debris and Bushrock

Where applicable, fauna habitat, including large woody debris and bush rock are to be salvaged and stored for placement in habitat areas identified during pre-clearance surveys. Storage must be undertaken within designated stockpile areas, with onsite contractors made aware that the material is to be retained.

4.6 Unexpected threatened species finds

All personnel working on the Project will need to be inducted on the potential for threatened species to occur within the Project area. The stop work procedure in the event any threatened flora or fauna unexpectedly occurs is shown in the following flow diagram.

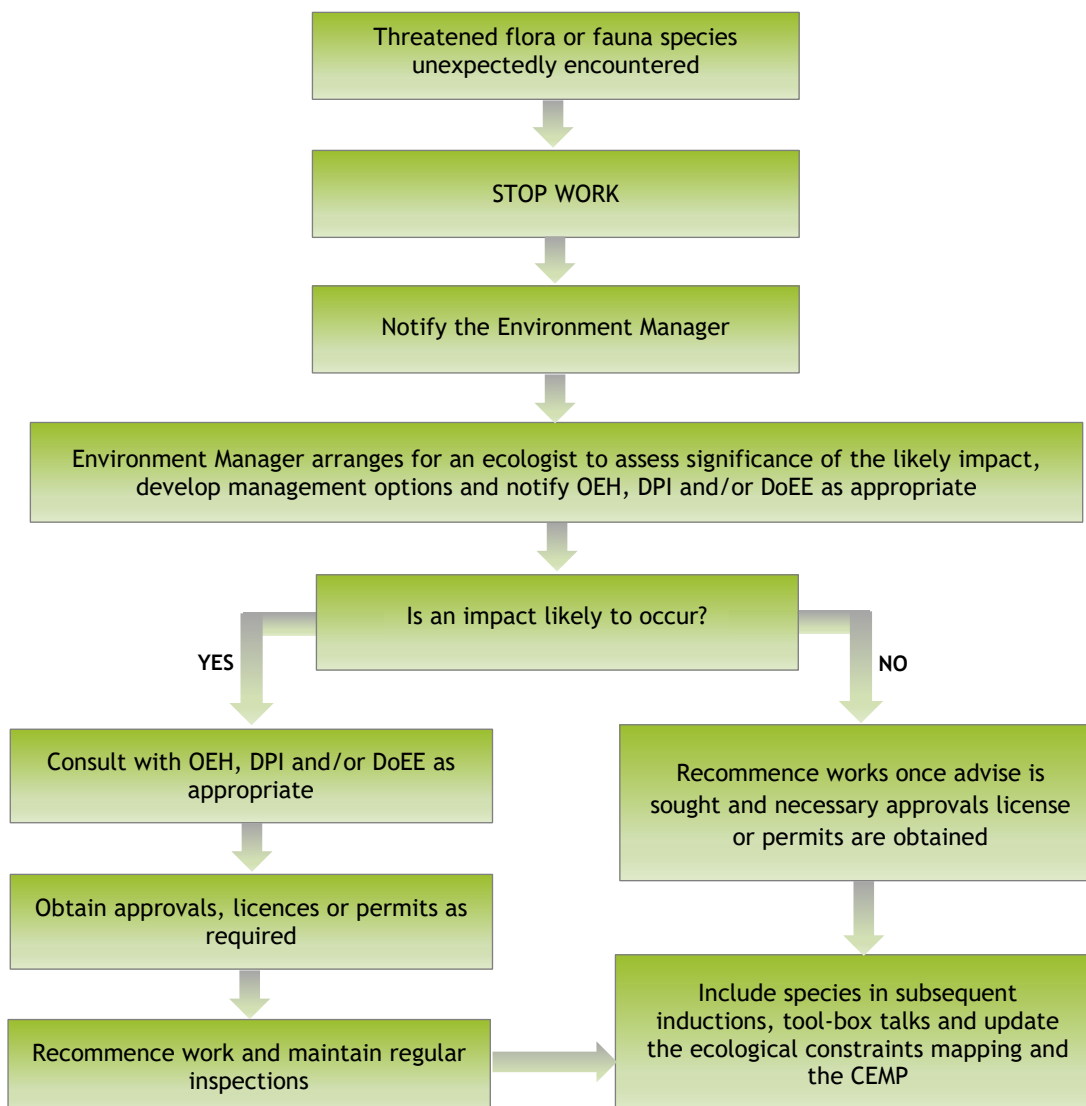


Figure 4-2. Stop work procedure (adapted from RMS Biodiversity Guidelines 2011)

5 Dam Decommissioning

5.1 Overview

Construction of the Project will require the decommissioning of a small farm dam, approximately 0.1 ha in surface extent.

Pre-decommissioning aquatic surveys found the dam to contain only *Anguilla australis* (short-finned eel) and a sparse cover of the native macrophytes *Eleocharis sphacelata* (tall spikerush) and *Juncus ustitatus* (common rush).

The dam is located approximately 135 m upstream of a larger farm dam beyond the Project area's work extent, which can be seen in the background of Figure 5-1 below.



Figure 5-1. Farm dam to be decommissioned

5.2 Recommended Approach

Due to the relatively small size of the dam it is unlikely that it holds sufficient volume of water useful for collection and reuse for dust suppression during construction activities. Consequently, the most practical approach to dewatering and rescuing aquatic fauna from the dam will be as follows:

1. Breach the dam wall at the western end and allow water to flow towards the larger farm dam to the southwest. The elevation between the dams allows for gravity flow towards the larger farm dam and the land between the two dams comprises pasture-land only.
2. Both water levels in both dams have been consistently low over the past years and prolonged dry conditions. It is anticipated that the larger farm dam has sufficient storage capacity to receive any

additional water from the dam being decommissioning. Although under present climatic conditions, it is unlikely that any significant flow would reach the larger farm dam and is more likely to be absorbed into the pasture land in between the two dams.

3. Prior to breaching the dam wall, fyke nets would be installed to allow the capture of eels and other aquatic fauna, which will naturally swim towards the location of the outflow. Netted aquatic fauna would then be transferred to vehicle-based holding tanks for transportation to the release site at Ropes Creek.
4. Once the dam is drained, the remainder of the dam wall should be removed to ensure that the dam does not refill should rainfall occur. The dam should then be left undisturbed for 24 hours to allow any eels that have taken refuge in the sediments to migrate from the dam of their own accord.

5.3 Environmental Requirements

5.3.1 Surface Water and Sediment Sampling

A surface water and sediment sampling program was undertaken at Oakdale West to assess the suitability of dam sediments and water for use in bulk earthworks and the suitability of dam water for discharge to Ropes Creek (AECOM April 2019). The sampling included the small dam which is to be decommissioned as part of the Project works and two sites within Ropes Creek for comparison.

Samples were analysed by laboratories using NATA certified methods to evaluate concentrations of contaminants of potential concern. Laboratory results were then compared to assessment criteria endorsed by the NSW EPA.

AECOM found that the concentrations of contaminants of potential concern were below the adopted assessment criteria in water samples analysed and were also generally consistent between the dam water and Ropes Creek.

5.3.2 Selected Release Location

The release location within Ropes Creek as shown on Figure 5-2 was selected on the following basis:

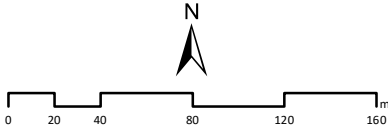
- Consistency between water sampling from the farm dam and Ropes Creek
- Accessibility and relatively short distance and subsequent limited time period in which transport of aquatic fauna would be required from the dam to the release site
- The geomorphology of the creek at the release site, which provides a relatively wide and deeper section within Ropes Creek and permanence of standing water
- It is an open system, which will enable released aquatic fauna to migrate freely from the point of release to reduce competition and predatory impacts at the release site

5.3.3 Relevant Permits

A qualified ecologist with relevant permit under Section 37 of the FM Act must be present on-site during, and following, the dewatering to ensure that appropriate action can be taken with regard to care and relocation of fauna residing in the dam.



- Farm dams
- Ropes Creek & tributaries
- Gradient to larger dam
- Release site



WNSLR Flora & Fauna Management Plan

Figure 5-2 Dam decommissioning

Coordinate System: MGA Zone 56 (GDA 94)
Image sources: Nearmap 7 April 2019

6 Monitoring and Reporting

6.1 Monitoring

Inspections of protected vegetation and activities with the potential to impact on flora and fauna will occur for the duration of the Project.

This shall include inspection of sediment and erosion controls, exclusion-fencing and other protection controls implemented to ensure that these measures remain fully functional for the duration of the Project.

6.2 Reporting

As part of the Project records legible environmental records of all environmental activities associated with FFMP are to be maintained to demonstrate compliance with the SSD 7328 consent conditions and related legislation. The records must include:

- Induction and training records
- Pre-clearance survey reports
- Records of related amendments to the Project CEMP
- Post-clearance reports, which are to include:
 - Details of native fauna captured and relocated, injured or deceased
 - Photos of rescued fauna
 - Location of released fauna
 - Number of habitat features felled
 - Analysis of the effectiveness of clearing and fauna rescue methods
 - Details of any woody debris, bushrock or hollow bearing trees that have been retained for habitat
- Reports of any stop work incidents (relating to unexpected finds), associated actions taken, and follow-up actions.

6.3 Performance Targets

The following targets have been established for the management of flora and fauna impacts during the Project, to ensure full compliance with the relevant legislative requirements, approvals, licences or permits:

- No disturbance to flora and fauna outside the proposed construction footprint and associated access tracks and site compounds
- No increase in distribution of weeds currently existing within the Project area
- No new weeds introduced to the Project area
- No transfer of plant diseases or pathogens to or from the Project work area
- All fauna species encountered during construction are handled humanely in accordance with industry standards
- No pollution or siltation enters biodiversity offset areas

7 Contingency Plan

Table 7-1 provides a summary contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduced as quickly as possible.

Table 7-1. Contingency Management Plan

Key Element	Trigger/Response	Condition Green	Condition Amber	Condition Red
Native vegetation clearance	Trigger	Clearing limits are clearly marked and disturbance is restricted to the delineated clearance areas. No stockpiling of equipment, soils, or machinery occurs beyond the clearance boundary. No encroachment of vehicles, equipment or works occurs beyond the clearance boundary.	Monitoring verifies that demarcation of clearing limits is not functioning in accordance with their design intent, OR Works activities / vehicle or plant movements have encroached beyond clearing limits.	Monitoring verifies clearing of native vegetation has occurred beyond clearing limits, OR Works activities / vehicle or plant movements that have encroached beyond clearing limits have caused damage to protected areas of vegetation.
	Response	No response required. Continue monitoring program.	Remediate immediately, OR Review work practices of contractors / personnel responsible and provide further site induction to ensure responsibilities are understood.	Reporting to government agencies. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable.
Fauna protection	Trigger	Clearing of native vegetation and habitat features is completed in accordance with Clearance protocols All fauna species encountered during construction are handled humanely in accordance with industry standards	Monitoring/review of reporting procedures verifies that Clearing of habitat features is undertaken in the absence of Clearance protocols, but no fauna species encountered	Monitoring/review of reporting procedures verifies that clearing of habitat features is undertaken in the absence of Clearance protocols, and results in death or injury of fauna species encountered

Key Element	Trigger/Response	Condition Green	Condition Amber	Condition Red
	Response	No response required	Review work practices of contractors / personnel responsible. Further clearance of native vegetation is to cease until further site induction undertaken to ensure responsibilities are understood.	Reporting to government agencies. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable.
Native vegetation protection	Trigger	Exclusion fencing and protection measures are installed and are functioning in accordance with their design intent.	Monitoring verifies that exclusion fencing and protection measures are not functioning in accordance with their design intent.	Monitoring verifies that works activities / vehicle or plant movements have impacted on areas of native vegetation to be protected.
	Response	No response required	Remediate immediately	Reporting to government agencies. Implement relevant responses and undertake immediate review to determine source of issues and implement remediation measures identified as soon as practicable.

Appendix A – Procedure for Vegetation Clearing

A.1 Pre-clearing assessment

The purpose of a pre-clearance assessment is to survey the Project site in search for the occurrences of:

- Habitat features suitable for native fauna that will require clear felling supervision and which will require a two-stage clearance procedure (refer Procedure A.5);
- Areas of high priority weeds requiring specific controls; and
- Any threatened flora or fauna that may have moved into the Project area since ecological surveys were conducted.

A.2 Marking Limits of Vegetation Clearing

Prior to any clearing being undertaken within the Project, the edge of the vegetation to be cleared needs to be clearly delineated. Clearing limits can be marked with high visibility tape, temporary fencing, or other appropriate boundary markers.

To avoid unnecessary damage to adjacent vegetation or inadvertent habitat removal, disturbance is to be restricted to the delineated area. No stockpiling of equipment, soils, or machinery will occur beyond the boundary.

Stock piling of materials must be done so in allocated areas within the clearing boundary and must not be placed within environmental sensitive areas.

The Contractor responsible for the clearance activities will be responsible for ensuring that the boundary markers are installed.

Materials and methods of marking trees to be removed or retained and protected will be agreed to prior to their employment. This will ensure there is no overlap with methods used by various Project contractors and that vegetation to be cleared, habitat features to be cleared, and vegetation to be retained and protected, are clearly identifiable.

Generally to minimise confusion over growing amounts of flagging tape generated by different surveys and the marking of environmental sensitive areas, certain colours will be used for specific purposes. The following colour coding system is an example of what could be used for this Project:

- Flagging tape and signage - indicates areas or trees to be protected;
- Green = individual trees to be retained and sensitive areas close to and/or adjoining the construction zone; and
- Red = habitat trees to be cleared

On completion of pre-clearance surveys and marking, this information will be transferred to constraints mapping for use in site inductions and GPS measurements will be provided for use by contractors.

A.3 Protection of Vegetation to be Retained

A.3.1 No-go / Exclusion Zones

No-go / exclusion zones shall:

- Be confirmed during pre-clearance surveys by the Project Ecologist and responsible Contractor.
- Be made completely visible and known to all contractors working on the Project.
- Be suitably delineated and protected by exclusion fencing.
- Remain untouched and not impacted for the duration of construction.
- Be marked on constraints mapping for use in site inductions.

A.3.1 Vegetation Protection

In addition to exclusion fencing, vegetation that is to be retained within biodiversity offset areas must be protected from the following:

- Compaction of roots and / or physical damage in accordance with Australian Standard 4970 - 2009 Protection of Trees.
- Sediment and erosion in accordance with the Project's Progressive Erosion and Sediment Control Plan (PESCP).

In general:

- Vegetation clearing will be minimised where possible. Where possible no plant, including motor vehicles, would be operated within 2x the dripline / canopy of retained trees, i.e. if the tree canopy is four metres in diameter, then an eight metre buffer will be placed around the tree trunk where the plant access is excluded.
- Compaction of soil and trampling of tree roots by machinery may lead to damage and the death of retained trees and should be avoided.
- All site offices, compounds and stockpile areas would be located within the limits of clearing or otherwise away from existing drainage lines and existing vegetation.
- Construction vehicle movements would be restricted to the haul road network or previously disturbed areas at all times.
- Construction vehicles should not enter into vegetation retained beyond the approved impact areas. At no point is cleared vegetation to be bulldozed into adjacent bushland retained beyond the limits of clearing.
- All other cleared native vegetation would be mulched for reuse in rehabilitation works and erosion control.
- Mulch should not be stockpiled in adjacent vegetated areas.

A.4 Single-stage clearing

Where no areas of habitat have been identified in vegetation to be cleared, clearing can be undertaken in a single-stage process, and includes the under-scrubbing of non-habitat trees, shrubs and other vegetation using a combination of forestry harvester and excavator in accordance with RMS QA Specification G40 Clearing and Grubbing.

Vegetation cleared during single-stage clearance shall not be stockpiled on-site as it may provide temporary habitat for displaced fauna.

A.5 Two-stage Clearance Procedure

A two-stage clearing process is designed to enable fauna to feel secure whilst clearing occurs around their tree, and to allow them a chance to self-relocate at night to coincide with typical foraging behaviours of arboreal animals.

Before the commencement of clearing works, local vets and or wildlife carers are to be notified.

A.5.1 Stage 1

Firstly, vegetation not identified during pre-clearance surveys as fauna habitat will be cleared. All vegetation around the habitat item will be cleared so that the fauna habitat item is isolated.

A.5.2 Stage 2

Secondly, identified habitat trees are left to stand overnight to allow resident fauna to voluntarily move from the area. Habitat trees are then cleared using the following protocols:

- Trees will be gently agitated by machinery prior to clearing to encourage any animals remaining to leave the hollows;
- An excavator will be used to start pushing the tree over. The excavator should have a grab mechanism that allows for the habitat tree to be lowered to the ground slowly, thus minimising the risk of injury or mortality to fauna. If salvageable, branches with hollows and sections of trunk will be marked and set aside for transfer to a storage area for eventual placement within rehabilitation areas;
- The ecologist onsite will inspect all visible hollows for the presence of fauna following felling of the tree; and
- The felled habitat tree will then be left over night to allow further opportunity for resident fauna to relocate. Following this, the tree is to be mulched to prevent any additional fauna returning to the tree or transported to the rehabilitation area to be used to provide fauna habitat.

In the event that arboreal animals do not move or they cannot be captured because the tree hollow is too large, high or its recovery would breach WH&S requirements then the tree will be felled (in the direction of other tree debris if possible) and animals recovered post-felling.

A.6 Clearing and Grubbing

The RMS QA Specification G40 Clearing and Grubbing outlines the protocols to be followed for clearing and mulching of understorey and shrubs (native and exotic) to minimise harm to flora and fauna throughout construction.

Clearing is defined as the removal of all vegetation (both living and dead).

A.6.1 Responsibilities

Similar to the responsibilities identified in this FFMP, the following applies:

Specialist role	Responsibility
Ecologist	Pre-clearing surveys, including ecological constraints mapping and identification of no-go zones. Fauna spotting, rescue and relocation during clearing
Survey team	Set out clearing boundaries for both permanent and temporary (ancillary) works. Flag boundaries (fluorescent tape, mesh fencing or appropriate boundary demarcation) so that the work teams can easily identify to erect bunting along the boundary where required. Assist marking out any of the environmental constraints and no-go zones identified by the ecologist.
Clearing contractors	Responsible for vegetation clearing Will need to be inducted into this procedure and the FFMP as well as all relevant Erosion and Sediment Control Plans for clearing activities. Prepare an Environmental Work Method Statement (EWMS) that is to cover all environmental risks and controls. The inputs will include the mapped ecological constraints and clearing boundaries, the FFMP, weed management and pathogen protocols as required.

A.6.2 Clearing and Grubbing Procedure

Timing/Activity	Tasks
Prior to commencement of clearing works	<ol style="list-style-type: none"> 1. Demarcation of clearing boundaries (preclearance surveys, survey and demarcation of no-go zones and constraints mapping completed) 2. A copy of the Clearing and Grubbing Protocol is to be adopted and approved 3. A clearing and grubbing checklist is to be completed by the work team and signed off by Management 4. Environmental Work Method Statement including a pre-clearance checklist is prepared and approved 5. Site induction 6. Sign off - pre-clearance checklist must be signed off and approved by the Project Environmental Representative
NON-HABITAT VEGETATION Sequence of clearing	<ol style="list-style-type: none"> 1. Pre-clearing weed control All infestations of scheduled weeds identified within the clearing area during the pre-clearing survey are to be managed prior to clearing and grubbing. 2. Boundary spotting clearing Boundary spotting clearing will occur first to establish a clear delineation for the boundary. A spotter will be used to direct machinery to ensure the boundary is cleared in the correct location. If necessary to clear certain areas for establishment of erosion and sediment controls this should be done early around the same time as boundary clearing. The erosion and sediment controls must be installed in accordance with the project ESCP. 3. Clearing - Clearing should first follow the alignment of the demarcated project clearing area, wherever possible, and ensure that trees are felled in a manner that ensures the trees fall within the clearing boundary. 4. Ground cover and topsoil stripping Once all the trees and shrubs are cleared, ground cover and topsoil stripping can occur. The topsoil stripping is to occur as a staged process and must observe any areas identified on the maps for weed infestation. Weed control, where required, is to occur prior to stripping these areas. The topsoil is to be carted to the designated stockpile areas making sure that topsoil from areas where weed infestation occurred is stored separately and disposed of according to Weed Management and Pathogen protocols. 5. Grubbing of any remaining tree stumps can occur and the holes left behind are to be backfilled and compacted to prevent erosion and ponding.
HABITAT VEGETATION	Refer A.5: Two-stage Clearance Procedure



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APPENDIX S

Unexpected Finds Protocol – Archaeological Items



Unexpected Finds Protocol – Archaeological Items

Project: Oakdale West Estate	Date: Friday, 1 November 2019
Client: Goodman Group	Author: Sandra Wallace (Senior Heritage Consultant)

Project Background

On 13 September 2019 consent for the proposed Stage 1 works was granted by the Secretary of the NSW Department of Planning and Environment. The development consent is for a State Significance Development (SSD), reference number is 15_7348, referred to as SSD 15_7348.

Artefact Heritage has prepared this Unexpected Finds Protocol (UFP) to satisfy the conditions of approval for the project, as below:

Table 1: Table of conditions

Archaeology		
Condition No.	Condition	Action
	(a) All work in the immediate vicinity of the suspected Aboriginal item or object must cease immediately;	
D106. If any item or object of Aboriginal heritage significance is identified on Site:	(b) A 10 m wide buffer area around the suspected item or object must be cordoned off; and	Refer to Unexpected Finds Protocol
	(c) The Biodiversity and Conservation Division of the Department must be contacted immediately.	
D107. Work in the immediate vicinity of the Aboriginal item or object may only recommence in accordance with the provisions of Part 6 of the National Parks and Wildlife Act 1974.		Refer to the Office of Environment and Heritage 2011 <i>Guide to Investigating, assessing and reporting on Aboriginal cultural heritage in NSW: Part 6 National Parks and Wildlife Act 1974</i>

Archaeology

D108. If any archaeological relics are uncovered during construction of Stage 1, then all works in the immediate vicinity of the relic must cease immediately. Unexpected finds must be evaluated and recorded in accordance the requirements of Department of Premier and Cabinet, Heritage (former NSW OEH Heritage Division).

The significance of unexpected finds will be assessed against the seven heritage criteria as outlined in the NSW Heritage Manual, including historical, associative, aesthetic or technical, social, research potential, rarity, and representativeness criterion. The aim of assessing significance is to identify if an unexpected find is of local or state significance. The assessment will guide recommendations for further management, approvals, and mitigations measures that may be required prior to recommencement of works

This UFP should be implemented if any potentially significant Aboriginal object or Non-Aboriginal archaeological remains are identified during proposed groundworks.

Examples of types of unexpected archaeological finds include:

- Potential Aboriginal flaked items
- Concentrations of artefacts – this may take the form of a number of artefacts concentrated in a single location, typically associated with a dark silty soil deposit. Artefacts may include complete or broken glass bottles and ceramic items, animal bone and other domestic items.
- Structural remains i.e. brick or stone footings, areas of buried paving.

NSW Heritage Legislation and Protection

Three Acts afford protection to cultural heritage and archaeology in NSW:

- *National Parks and Wildlife Act 1974* (NPW Act)
- *Heritage Act 1977* (Heritage Act)
- *Environmental Planning and Assessment Act 1979* (EP&A Act).

Aboriginal sites are protected by all three acts. It is an offence to knowingly or unknowingly damage or disturb an Aboriginal site without the appropriate approval. Fines and prison sentences may apply.

Historical archaeological sites in NSW are protected by the NSW *Heritage Act 1977*. Sections 139-145 of the *Heritage Act 1977* prevent the excavation or disturbance of land known or likely to contain **historic Archaeological Relics**, unless in accordance with an excavation permit or with the conditions of approval for a State Significant Development. If an archaeological site or object is damaged or disturbed prosecution may result.

Unexpected Finds Protocol

If unanticipated archaeological items are uncovered at any time throughout the life of the project the following actions must be followed:

- Cease all activity in the vicinity of the find
- Leave the material in place and protect it from harm
- Erect a 10 m exclusion zone (temporary fencing/signage)
- Take note of the details of the material and its location, take a photograph of the find *in situ*
- Inform the site manager/area supervisor, who would then inform the superintendent / principal

The superintendent / principal must:

- Notify OEH on the Environment Line: **131 555**
- Call the archaeologist to identify whether additional investigation is required in accordance with the conditions of approval and OEH guidelines
- Notify OEH if confirmed as an Aboriginal object or relic
- Await further advice before proceeding with work in the area.

Artefact archaeologist contact

Artefact Heritage, Pyrmont Office **02 9518 8411**, office@artefact.net.au

Examples of Aboriginal heritage and historical archaeological remains



APPENDIX T

Unexpected Contamination Protocol

Unexpected Contamination Protocol

Oakdale, Western North South Link Road



Unexpected Contamination Protocol

Oakdale, Western North South Link Road

Client: Goodman Property Services (Aust) Pty Ltd

ABN: 40 088 981 793

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Quality Information

Document Unexpected Contamination Protocol

Ref 60441214

Date 31-Oct-2019

Prepared by Alex Latham

Reviewed by Clayton Cowper

Revision History


Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	29-Nov-2018	Draft for comment	Alex Latham Associate Director	
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Glossary

General Terms	
ACM	Asbestos Containing Material
ASC NEPM	Assessment of Site Contamination National Environment Protection Measure (2013)
BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
CoPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
CEMP	Construction Environmental Management Plan
DQI	Data Quality Indicators
DQO	Data Quality Objectives
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
ESL	Ecological Screening Level
FIP	Fill Importation Protocol
Ha	Hectare
HIL	Health Investigation Level
HSL	Health Screening Level
LOR	Limit of Reporting
M	metre
m bgs	Metres below ground surface
mg/kg	milligrams/kilogram
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
OCP	Organochlorine Pesticides
OPP	Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PID	Photoionisation detector
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Difference
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UST / UPSS	Underground Storage Tank / Underground Petroleum Storage System
VOC	Volatile Organic Compound

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by Goodman Property Services (Aust) Pty Ltd (Goodman) to prepare an Unexpected Contamination Protocol (UCP) for the earthworks associated with the construction of the Western North South Link Road (WNSLR) (the Site) at the Oakdale development, Kemps Creek and Erskine Park, NSW.

The WNSLR will extend for approximately 1300 m from the north east portion of Oakdale West Estate (OWE) to meet Lenore Drive. Drawings showing the proposed WNSLR are provided in **Appendix A**. Goodman propose to construct the WNSLR under State Significant Development 7348 (SSD 7348).

It is expected that construction of the WNSLR will include cut and fill earthworks. This UFP relates to soil contamination and applies up to completion of the WNSLR.

This UFP has been developed on the basis of data collected by:

- AECOM (2007): *Phase I Environmental Site Assessment, Oakdale Concept Plan, Kemps Creek/Horsley Park, NSW*. 13 December 2007.
- AECOM (2012): *Oakdale Western Precinct, Targeted Phase II Contamination Assessment*. 27 July 2012.
- AECOM (2016): *Phase I ESA, Oakdale Western North-South Link Road*. 21 June 2016.
- Pells Sullivan Meynick (2018a): *Western North South Link Road, Additional Geotechnical Investigation – Bridge*. 10 August 2018.
- Pells Sullivan Meynick (2018b): *Oakdale West Estate – Proposed Sewer Alignment Geotechnical and Salinity Investigation*. 12 October 2018.

Where unexpected finds are encountered, Goodman must be notified.

A Fill Importation Protocol (FIP) was developed by AECOM (2019). The FIP stipulates the soil and aggregates that will be imported to the Site for construction of the WNSLR.

1.1 Objectives

The objectives of this UCP are to:

- Provide a summary of the expected ground conditions.
- Provide a summary of unexpected finds that may be present, based on Site history data.
- Provide management and assessment recommendations for any identified unexpected finds encountered during WNSLR construction earthworks.

1.2 Guidelines

AECOM completed this UCP with reference to the following guidelines:

- National Environment Protection Measure (NEPM), *Assessment of Site Contamination (ASC)* (National Environment Protection Council [NEPC], 1999 as amended (2013) (the ASC NEPM).
- NSW EPA (2017). *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition)*.
- NSW OEH (2011). *Guidelines for Consultants Reporting on Contaminated Sites*. NSW Government Office of Environment & Heritage (OEH).
- SafeWork NSW (2016a). *How to manage and control asbestos in the workplace Code of Practice*.
- SafeWork NSW (2016b). *How to safely remove asbestos Code of Practice*.
- WorkCover (2014). *Managing asbestos in or on soil*. March.

1.3 SSD Conditions of Consent

The SSD Conditions of Development Consent were issued to Goodman on 13 September 2019. With respect to soil contamination, these are summarised in the following table:

Table 1 Consent Requirements

Condition Requirement	Section / Comment
D116. Prior to the commencement of construction of Stage 1, the Applicant must prepare an unexpected contamination protocol to ensure that potentially contaminated material is appropriately managed. The procedure must form part of the CEMP in accordance with Condition D119 and must ensure any material identified as contaminated is disposed to a licensed landfill facility, with the disposal location and results of testing submitted to the Planning Secretary, prior to its removal from the Site.	This UFP.
D121 (k). As part of the CEMP required under Condition D119 of this consent, the Applicant must include an Unexpected Contamination Protocol.	This UCP is to be included in the CEMP prepared by SLR Consulting Australia Pty Ltd.
Management Plan Requirement	Section / Comment
D118. Management plans required under this consent must be prepared in accordance with relevant guidelines and include:	
a) details of: <ul style="list-style-type: none"> i. the relevant statutory requirements (including any relevant approval, licence or lease conditions); ii. any relevant limits or performance measures and criteria; and iii. the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, Stage 1 or any management measures; 	Section 1.2 and Section 5.0.
b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	This UCP
c) a program to monitor and report on the: <ul style="list-style-type: none"> i. impacts and environmental performance of Stage 1; and ii. effectiveness of the management measures set out pursuant to paragraph (b) above; 	Continual monitoring during bulk earthworks. Sections 3.1 to 3.4.
d) 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;	This UCP
e) a program to investigate and implement ways to improve the environmental performance of Stage 1 over time;	Completed in CEMP
f) a protocol for managing and reporting any: <ul style="list-style-type: none"> i. incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); ii. complaint; iii. failure to comply with statutory requirements; and 	Completed in CEMP
g) a protocol for periodic review of the plan.	Completed in CEMP

2.0 Background Information

2.1 Site Conditions

The Site essentially comprises gently undulating rural land (paddocks for grazing). In summary:

- A water pipeline and its land is present, over which part of the WNSLR, bridge and approaches will be built. Spoil from pipeline construction appears to be placed on the northern and southern side of the water pipeline easement. Some plastic rubbish (former plant guards, understood to be associated with Greening Australia's re-vegetation works in the general area) and concrete blocks have been observed on/in the spoil on the northern side of the easement. The spoil appeared to comprise clay, shale and ironstone.
- Land to the south of the pipeline generally slopes down towards the north.
- Land to the north of the pipeline generally slopes down to the south. Land in the vicinity of Erskine Park Link Road (Lenore Drive) is near level.

A large stockpile of soil material is present near Lenore Drive. AECOM understands this material is not located on the Site, nor is it proposed to be used at the Site.

2.2 Phase I ESA 2007

The Phase I ESA included the proposed Oakdale development, representing approximately 420 hectares. Site history and background data for the north east portion of OWE is summarised below:

- The Site comprised rural (pastoral lands) since the early to mid 1800s.
- Site soils were expected to comprise clay of the Blacktown and/or Luddenham Soil Landscape Groups and fluvial soils of the South Creek Soil Landscape Group (near Ropes Creek), overlying Shale bedrock.
- Regional groundwater was likely to occur within sedimentary rock at depths greater than 20 metres below ground surface (m bgs) although seasonal, shallow perched groundwater may exist at the soil-bedrock interface and shallow groundwater would likely be present in fluvial soils along drainage lines.
- Surface application of "envirosoil" (recycled sewage waste) had occurred to approximately 80 mm depth in the north eastern portion of the OWE.
- Some spot applications of phenoxyacetic acid herbicides (e.g. to control blackberry and other woody weeds) has been historically undertaken, on an 'as needs basis'.
- No burial pits for animal carcasses were known to be present.

2.3 Targeted Phase II Assessment 2012

AECOM completed a targeted assessment at OWE based on the results of the Phase I ESA. The only area investigated in the targeted assessment that relates to the WNSLR was an area of "envirosoil" application. The sample location plan from this assessment is included in Appendix A.

Nine exploratory test pits (TP29 to TP37) were excavated to depths between 0.5 and 0.8 m bgs in the area of envirosoil application. Conditions were logged to comprise dark brown to black clayey sandy silt topsoil overlying mottled brown-grey-red silty clay. No fill materials were identified.

Soil samples were collected from each test pit and samples submitted for laboratory analysis to evaluate concentrations of the inferred contaminants of potential concern (CoPC) associated with envirosoil, which included the following:

- Suite of eight metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc).
- Benzene, toluene, ethylbenzene, xylenes (BTEX).
- Total Recoverable Hydrocarbons (TRH).

- Polycyclic aromatic hydrocarbons (PAH).
- Organochlorine and organophosphorus pesticides (OCP, OPP).
- Polychlorinated biphenyls (PCB).
- Asbestos

In summary, the results of the Phase II ESA were:

- Groundwater was not observed in the test pits completed.
- No unusual odours or colouration in soil were observed at the test pits completed.
- Concentrations of the CoPC investigated at test Pits TP29 to TP37 were below assessment criteria applicable for commercial/industrial land use.

Groundwater was not investigated. Based on the Phase II data, the potential for groundwater contamination to be present was considered to be low.

The AECOM sample location plan is provided in **Appendix A**.

2.4 Phase I ESA 2016

The Phase I ESA was undertaken on the proposed route of the WNSLR, as at June 2016. The proposed route in 2016 was similar to the current proposed route however, the 2016 assessment included a strip of land running parallel to Lenore Drive and to the east, towards Ropes Creek. This area is no longer part of the proposed WNSLR and the change in the proposed route is not considered to have an impact on the interpretation of the data.

The Phase I ESA data indicated the following:

- Soils were expected to be clay based, associated with Wianamatta Shale bedrock.
- No registered groundwater extraction bores were identified within a 500 m radius of the WNSLR. Search data indicated that groundwater would likely occur in sedimentary rock units at depths generally greater than 20 m bgs. It was anticipated that seasonal shallow groundwater may exist at the Site, generally at the interface between clay soils and shale bedrock.
- The Site was part of a 3000 acre grant made to James Erskine in 1818. Land use subsequent to this appeared to comprise rural (primarily grazing), apart from construction of the pipeline from circa the mid 1940s.
- Site inspection observations made by AECOM indicated that pipeline spoil was present to the north of the easement. Some plastic rubbish (former plant guards associated with re-vegetation) and concrete blocks have been observed on/in the spoil, indicating that other waste materials may be present.
- A validation report was prepared by Consulting Earth Scientists (CES) in 2007 for approximately 120 hectares of land located on the northern side of the pipeline easement. The WNSLR will be located in part of this land. In summary, the CES report indicated:
 - Soil conditions were logged to comprise silty clay topsoil overlying clay soils grading to weathered claystone. Groundwater was not encountered to the depth investigated (3 m bgs).
 - No areas of environmental concern were identified by CES within the WNSLR route.
 - Remediation of surface soils containing fragments of asbestos containing material (ACM) were identified in three separate areas and remediated. These areas were not located within the WNSLR.
 - Concentrations of the chemical CoPC investigated (TRH, BTEX, PAH, OCP, OPP, PCB and suite of eight metals) were below the adopted assessment criteria for commercial/industrial land use.
- Based on the available data, AECOM concluded that the potential for soil contamination to be present was low and the Site was considered suitable for use as the WNSLR.

2.5 Geotechnical Investigations

AECOM has been supplied with two reports prepared by Pells Sullivan Meynick (PSM). Review of the reports indicated the following:

- Approximately 20 boreholes have been completed in the north east portion of OWE. No fill materials were identified. Soils were logged to comprise dark brown to black clay topsoil overlying yellow-orange-brown and red-grey-orange/brown clays, grading to shale bedrock. Shallow groundwater was identified immediately adjacent to Ropes Creek, at 3.5 to 5 m bgs.
- Six boreholes were drilled in or within close proximity to the water pipeline easement. Logged conditions were:
 - Northern side of pipeline easement: approximately 2.5 m of grey-red-brown sandy clay (reworked natural, or easement spoil), overlying orange-red-brown clay, grading to shale bedrock at approximately 4 to 4.5 m bgs
 - Pipeline Easement: asphalt access road with roadbase sub-grade overlying grey-red-yellow-brown sandy clay, grading to shale bedrock at approximately 3 to 3.8 m bgs.
 - Southern side of pipeline easement: red-grey-brown clay to approximately 8 m bgs, overlying shale bedrock.

PSM borehole plans are provided in **Appendix A**.

3.0 Unexpected Finds

3.1 Roles and Responsibilities

Roles and responsibilities for the Site works are expected to include:

Table 2 Roles & Responsibilities

Company	Role / Responsibility
Goodman	Developer
AT&L	Project Manager / Superintendent
Robson Civil	Earthworks Contractor
AECOM	Contamination Consultant

In the event that unexpected finds are encountered:

- The Earthworks Contractor will immediately inform the Superintendent and AECOM.
- The Superintendent will inform Goodman.
- AECOM will inspect the unexpected find (if required).

In the event that any identified unexpected find requires remediation, the following is noted:

- A Remedial Action Plan (RAP) should be prepared by the Contamination Consultant prior to undertaking the remediation works. The RAP will be prepared in accordance with applicable NSW EPA approved guideline documents. The RAP will include disposal locations and results of testing of materials identified as contaminated and is to be submitted to the Planning Secretary, prior to removal from Site
- Following any remediation work, a validation report will be prepared, confirming that all requirements of the RAP have been met, including documentary evidence confirming off-site disposal of contaminated soils (refer **Section 5.0** of this document).
- The validation report will be available to the Planning Secretary of the Department of Planning upon request.

3.2 Asbestos Containing Materials

In the event that fragments of ACM are identified during the earthworks, the Earthworks Contractor (EC) should collect fragments and store in an appropriate location (e.g. plastic lined skip bin). The ACM will be disposed of in skip bins for appropriate transportation to a licensed landfill facility. This disposal process will be tracked via the Material Tracking Plan (refer to **Section 4.0**) and the landfill documentation included in the Validation Report. All work must be conducted in accordance with SafeWork NSW (formerly WorkCover) policy and licensing requirements.

If large quantities of ACM are identified, excavation and stockpiling is recommended. Excavation should continue until there is no visible ACM. Stockpiles should be kept moist and covered until disposed off-Site.

Validation sampling of the stockpiles to assess suitability for potential re-use is not recommended.

Areas that are excavated will require validation sampling, to confirm removal of the ACM. Validation sampling should be done with reference to the Western Australian Department of Health (DoH) *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia* (May 2009) and ASC NEPM 2013.

With reference to the WorkCover NSW (2014) *Managing Asbestos in or on Soil* and Safework NSW (2016b) *How to Safely Remove Asbestos*, implementation of the following management measures are recommended if asbestos is identified:

- Less than 10 m² of bonded asbestos (e.g. fragments of fibro in good condition):
 - Handpick the fragments and double wrap in plastic sheeting. Inspection/handpicking should be completed on a grid basis for a systematic approach.
 - Appropriate personnel protective equipment should be worn.
 - Appropriately trained personnel should be utilised.
 - The area should be inspected by an appropriately qualified hygienist to confirm removal of the asbestos fragments.
 - A Licensed asbestos removal contractor (Class A or B) should not be required.
 - Air monitoring for asbestos fibres should not be required.
- More than 10 m² of bonded asbestos:
 - A Class B licensed asbestos removal contractor will be required to collect and dispose of the materials.
 - Handpick the fragments and double wrap in plastic sheeting. Inspection/handpicking should be completed on a grid basis for a systematic approach.
 - Appropriate personnel protective equipment should be worn.
 - Appropriately trained personnel should be utilised.
 - Air monitoring for asbestos fibres may not be required but should be considered if there are reasonable grounds to expect that exposure standards have been or could be exceeded.
 - The area should be inspected by an appropriately qualified hygienist to confirm removal of the asbestos fragments.
- Friable asbestos is identified:
 - Isolate and secure the area by installing warning signs and barriers.
 - Keep the soil damp but not flooded and if safe, cover the area with plastic sheeting.
 - Class A licensed asbestos removal contractors will be required.
 - Air monitoring will be required.
 - The area should be inspected by an appropriately qualified hygienist to confirm removal of the asbestos.
 - Friable asbestos must be stored in sealed containers.
 - Asbestos waste must be transported in a covered, leak proof vehicle.

3.3 Burial Pits

In the event that burial pits relating to the former grazing activities are exposed, works will cease in that area and AECOM, Goodman and/or the Site Superintendent will be contacted immediately. An exclusion zone will be established around the burial pit and an appropriate occupational health and safety (OHS) protocol for entry into the exclusion zone will be implemented. All carcass' and impacted soils will be removed appropriately and disposed off-Site at a registered facility. Soils remaining in the burial pit will be validated for total phosphorus (TP), filterable reactive phosphorus (FRP), total nitrogen (TN), nitrate (NO₃), nitrite (NO₂), total Kjeldahl nitrogen (TKN) and ammonia (NH₄⁺). Other contaminants may require assessment, depending on the nature of the buried material.

3.4 Other Unexpected Finds

If materials are encountered during the earthworks which are significantly different to those described in the AECOM, CES and PSM reports (including the identification of drums or underground storage tanks, etc.), works will cease in that area and AECOM, Goodman and the Site Superintendent will be contacted immediately. An exclusion zone will be established around the unexpected find area and an

appropriate OHS protocol for entry into the exclusion zone will be implemented. AECOM will inspect the unexpected find and assess if it is the source or has the potential to contaminate the surrounding area. In the case that there is potential for contamination or it has occurred, all materials and impacted soil will be removed appropriately and disposed off-site at a registered facility. Remaining soils will be validated for CoPC (refer **Section 2.3**) and any additional analytes specific to the unexpected find.

4.0 Materials Tracking Plan

A Materials Tracking Plan (MTP) will be developed and implemented by the EC. All materials handled during the earthworks will be tracked in order to allow verification of the correct movement and handling. The system will track materials from ‘cradle-to-grave’ and will provide information on the location and quantity of all material movements both on and off-Site, so that the material being handled can be identified and accounted for.

The MTP will include confirmation of stockpile locations and contamination status by regular communication between AECOM, the EC and the Site Superintendent. Where necessary, stockpiles and/or pit locations will be recorded by surveying, to reduce the risk of cross-contamination between stockpiles.

As part of the MTP, records shall be kept to ensure that backfilling of excavations and beneficial reuse of material only occurs following the successful validation of the subject materials.

The EC must implement a MTP, to appropriately control and manage the excavation of material at the Site. The purpose of the MTP is to ensure that material movements are controlled at all times and placed in their correct locations.

The MTP should be based on the proformas provided in **Appendix B**, as summarised below:

- **Material Excavation Form:** a record of excavated materials on the Site which includes the date, material type/description, excavated quantity, origin and intended destination.
- **Stockpile Register:** a record of all materials placed in stockpiles which includes the date, material type/description, stockpiled quantity, origin and intended end use (which will be “for characterisation”, “for backfilling” or “for off-site disposal”). Material excavated and stockpiled will be identified with a marker flag or stake clearly labelled with the stockpile source information and a stockpile ID.
- **Material Placement Form:** a record of all materials backfilled on the Property which includes the date, material type, quantity backfilled and origin.

Any soil and other waste materials that require off-Site disposal, must be classified in accordance with the NSW EPA (2014) Waste Classification Guidelines.

5.0 Validation Reporting

At the completion of the earthworks and in the event that any unexpected contamination finds were encountered that required remediation, AECOM will prepare a Validation Report in accordance with the requirements of the NSW OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites* and NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme* (3rd Edition). The Validation Report will include the following information:

- An overview of the earthworks carried out.
- Survey plans outlining the extent and elevations of the earthworks.
- The location of validation samples (if validation sampling is required).
- Descriptions of sampled materials (including visual and olfactory observations, if required).
- Summary tables for soil analytical results.
- NATA registered laboratory analytical certificates.
- Summary of the tracking and fate of all excavated materials (detailed in a Stockpile Register).
- Demonstration that the MTP has been implemented appropriately including copies of the EC's documentation.
- Landfill weighbridge dockets (if required).
- A summary of data reviewed and collected under the FIP.
- Conclusion as to the suitability of the Site for the proposed land use.

6.0 References

- AECOM. 2007. *Phase I Environmental Site Assessment, Oakdale Concept Plan, Kemps Creek/Horsley Park, NSW*. 13 December 2007 (ref: S4074201_RPTFinalRev02_13Dec07)¹.
- AECOM. 2012. *Oakdale Western Precinct, Targeted Phase II Contamination Assessment*. 27 July 2012 (ref: 60268528-RPE-20120727_0).
- AECOM. 2016. *Phase I ESA, Oakdale Western North-South Link Road*. 21 June 2016 (ref: 60441214-RPE-20160621_0).
- AECOM. 2019. *Fill Importation Protocol, Oakdale, Western North South Link Road*. 24 September 2019 (ref: 60441214-WNSLR FIP-20190924_4).
- Consulting Earth Scientists. 2007. *Validation Report: Lots 6 to 8 DP 253678, Lot 10 DP 253678 and Lot 197 DP 1087837, Fitzpatrick Land, Lenore Lane, Erskine Park NSW*. 21 June 2007.
- NEPC, 2013. *National Environment Protection (Assessment of Site Contamination) Measure 1999*. National Environment Protection Council. ASC NEPM, May 2013.
- NSW EPA. 2017. *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition)*. October 2017.
- NSW EPA. 2014. *Waste Classification Guidelines, Part 1: Classifying Waste*. November 2014.
- NSW OEH. 2011. *Guidelines for Consultants Reporting on Contaminated Sites*. NSW Government Office of Environment & Heritage (OEH).
- Pells Sullivan Meynick. 2018a. *Western North South Link Road, Additional Geotechnical Investigation – Bridge*. 10 August 2018.
- Pells Sullivan Meynick. 2018b. *Oakdale West Estate – Proposed Sewer Alignment Geotechnical and Salinity Investigation*. 12 October 2018.
- SafeWork NSW. 2016a. *Code of Practice: How to Manage and Control Asbestos in the Workplace*.
- SafeWork NSW. 2016b. *Code of Practice: How to Safely Remove Asbestos*.
- WA DOH. 2009. *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. May 2009.
- WorkCover NSW. 2014. *Managing asbestos in or on soil*. March.

¹ Completed by HLA ENSR Australia Pty Ltd, now part of AECOM.

Appendix A

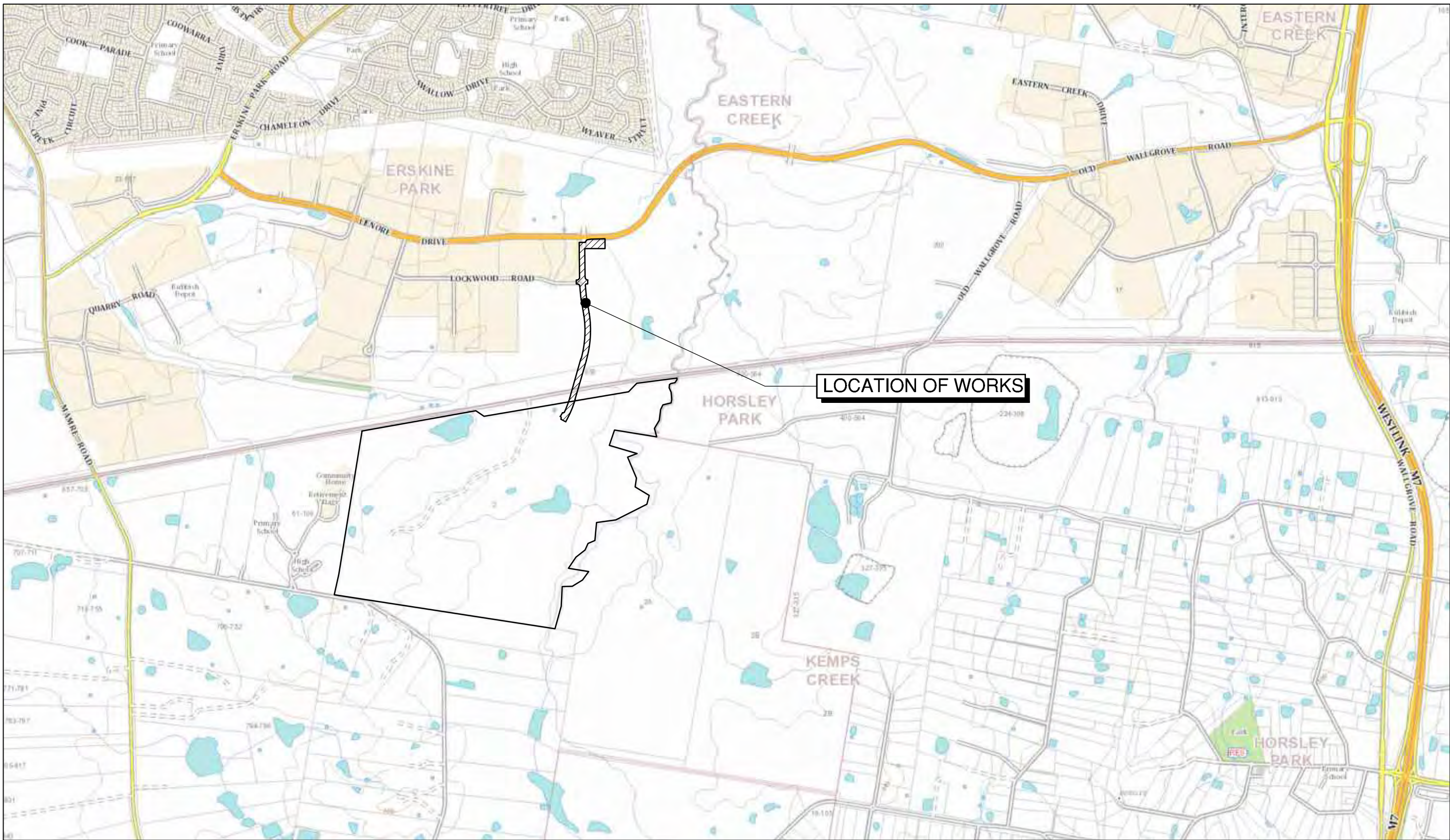
Figures

OAKDALE WEST

3000-SERIES WESTERN NORTH-SOUTH LINK ROAD

CIVIL WORKS PACKAGE

STATE SIGNIFICANT DEVELOPMENT APPLICATION



LOCALITY PLAN
NTS

Bar Scales

P1	ISSUED FOR DRAFT REVIEW	8-4-16
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Issue	Description	Date
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Status	DRAFT ISSUE	A1
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Scales		15-272-C3000.dwg	
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	Designed	MM	

Height Datum	AHD	Checked	AM
Grid	MGA	Approved	

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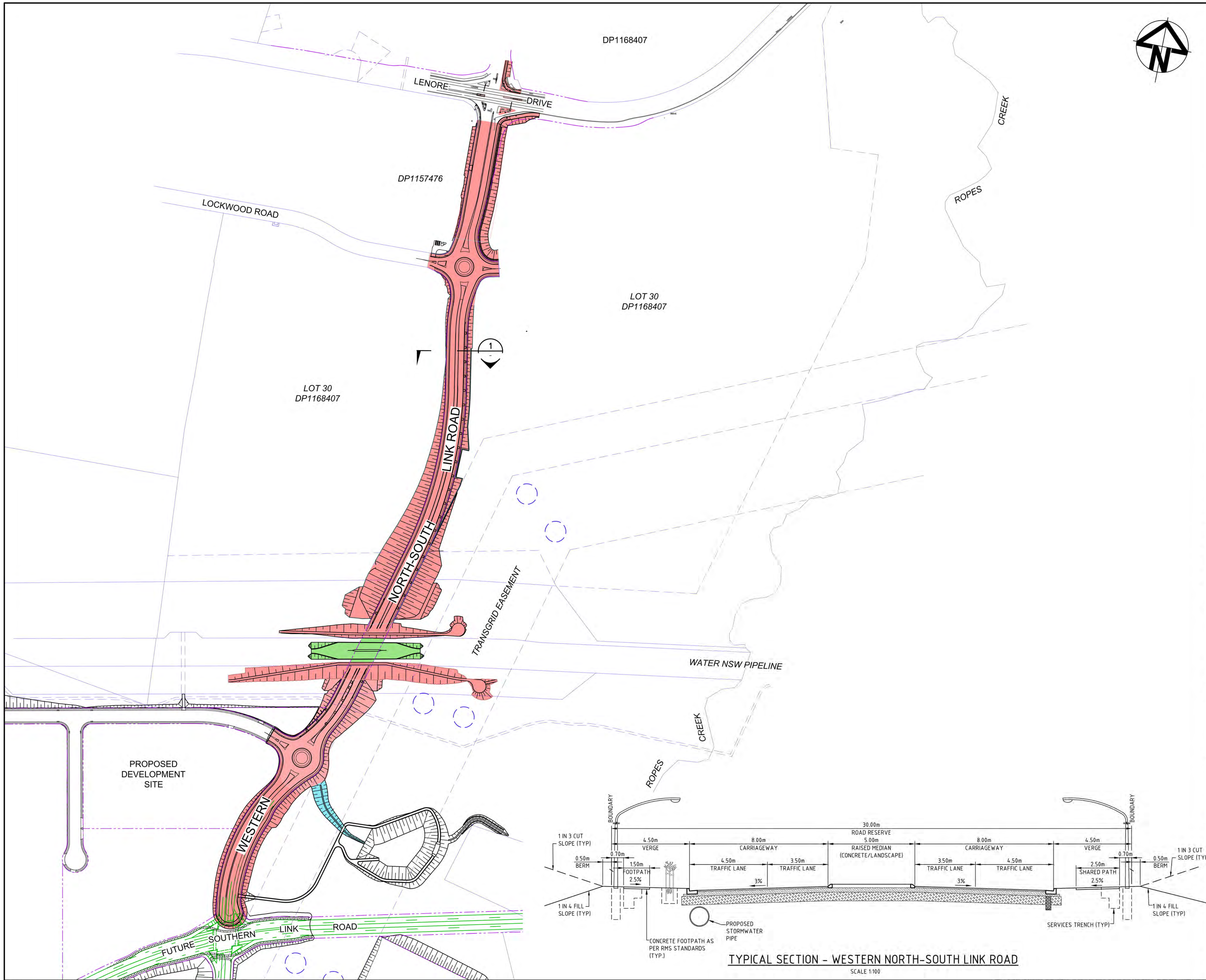
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**PROPOSED INDUSTRIAL
DEVELOPMENT
OAKDALE WEST**

Title

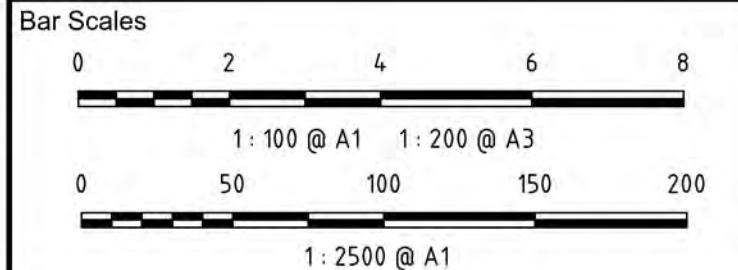
COVER SHEET

Drawing No.	Project No.	Issue
15-272-C3000	15-272	P1



LEGEND

- EXISTING BOUNDARY
- EXISTING EASEMENT
- PROPOSED BOUNDARY
- WESTERN NORTH-SOUTH LINK ROAD
- PROPOSED BRIDGE CROSSING
- STORMWATER DRAINAGE SWALES



A3	ISSUED FOR SSD APPROVAL	21-09-18
A2	ISSUED FOR SSD APPROVAL	04-05-18
A1	ISSUED FOR SSD APPROVAL	14-03-17

Issue	Description	Date
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Grid	MGA	Approved	AM



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Project

PROPOSED INDUSTRIAL DEVELOPMENT OAKDALE WEST

Title

WESTERN NORTH-SOUTH LINK ROAD GENERAL ARRANGEMENT PLAN

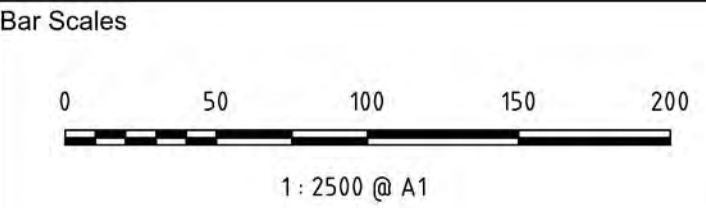
Drawing No.	Project No.	Issue
15-272-C0020	15-272	A3



LAND ACQUISITION SCHEDULE

LAND OWNER	APPROX. LAND TAKE AREA (m ²)
WATER NSW	3,459*
FITZPATRICK	25,507*
GOODMAN LAND	19,222*
WATERSNSW BRIDGE STRATUM	2,027*

*AREA SUBJECT TO FINAL SURVEY



A5	ISSUED FOR SSD APPROVAL	21-09-18
A4	ISSUED FOR CLIENT REVIEW	17-09-18
A3	ISSUED FOR CLIENT REVIEW	11-09-18
A2	ISSUED FOR SSD APPROVAL	04-05-18
A1	ISSUED FOR SSD APPROVAL	14-03-17

Issue	Description	Date
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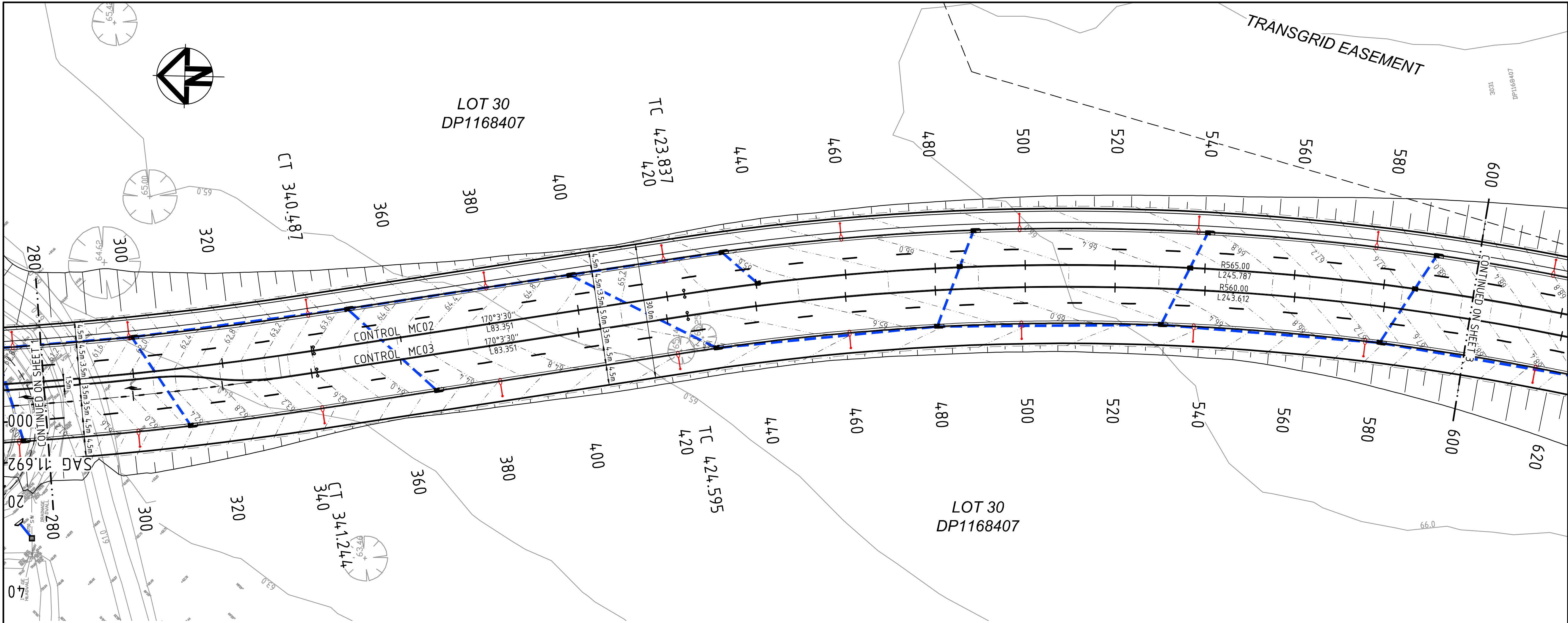
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PROPOSED INDUSTRIAL DEVELOPMENT OAKDALE WEST

Title

WESTERN NORTH-SOUTH LINK ROAD PROPOSED LAND ACQUISITION PLAN

Drawing No.	Project No.	Issue
15-272-C0023	15-272	A5



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EXISTING EASEMENT

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EXISTING CONTOUR

PROPOSED BOUNDARY

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PROPOSED CONTOUR

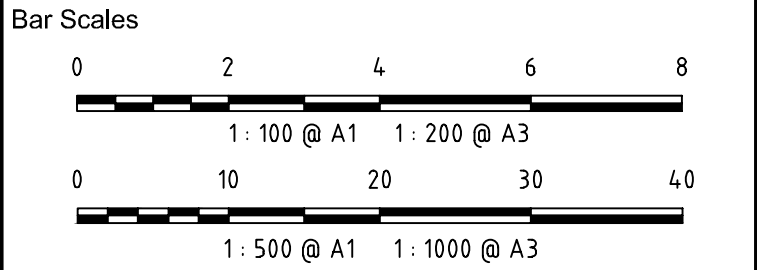
PROPOSED KERB AND GUTTER

PROPOSED STORMWATER PIPE

PROPOSED KERB INLET PIT

PROPOSED HEADWALL

PROPOSED BRIDGE DECK
REFER DWG C3040 FOR DETAILS



P1	ISSUED FOR DRAFT REVIEW	8-4-16
Issue	Description	Date

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Grid	MGA	Approved	

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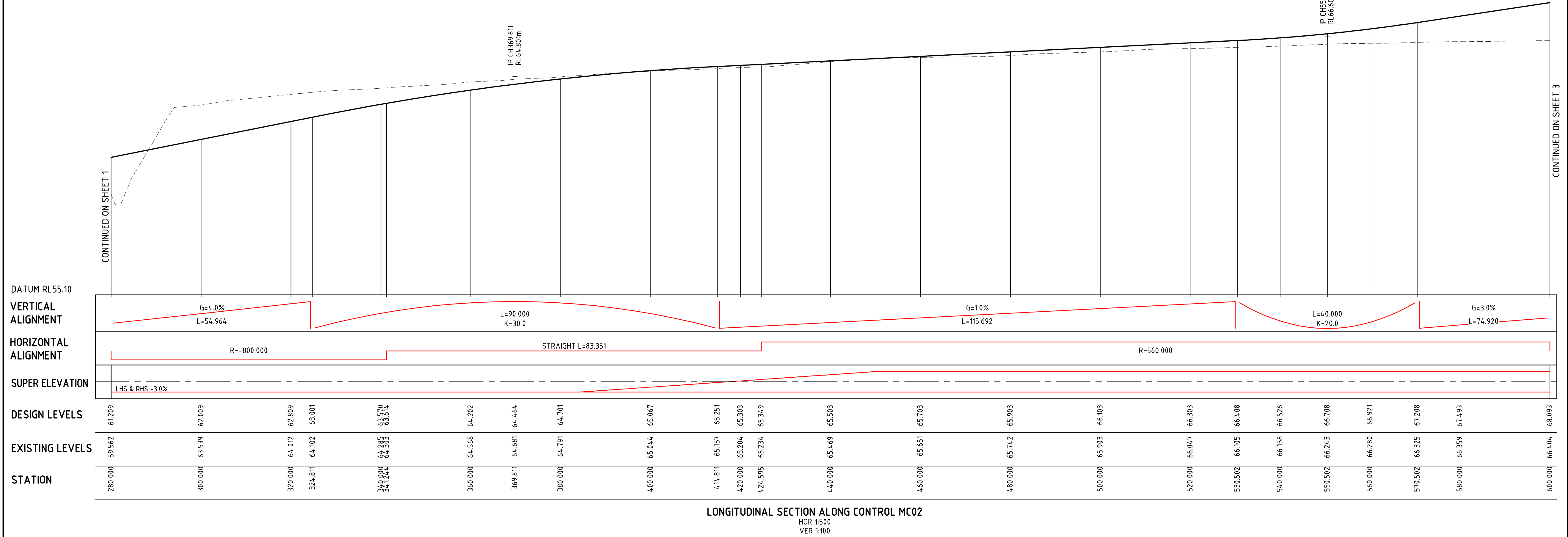
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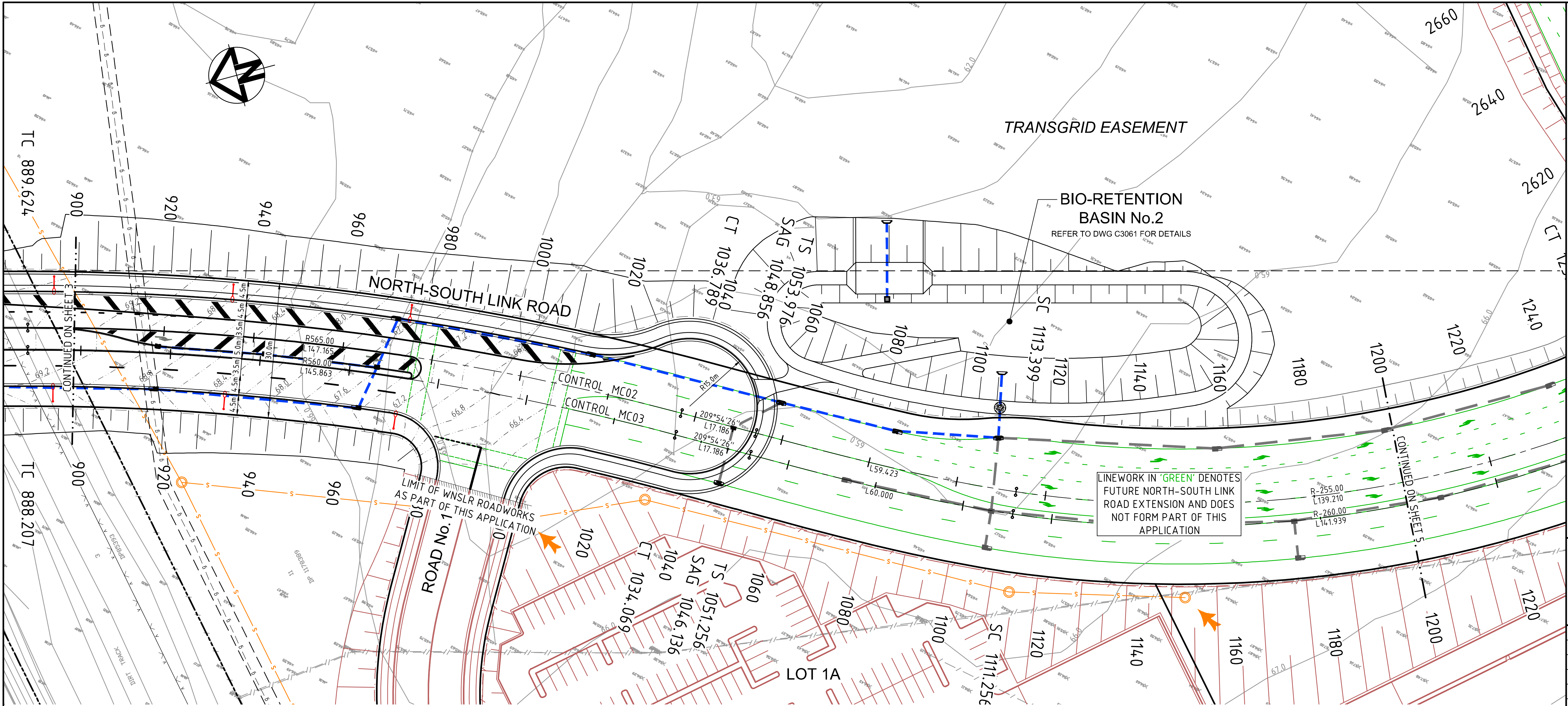
PROPOSED INDUSTRIAL DEVELOPMENT
OAKDALE WEST

Title

ROADWORKS PLAN AND
LONGITUDINAL SECTION
SHEET 2 OF 5

Drawing No.	Project No.	Issue
15-272-C3021	15-272	P1





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EXISTING EASEMENT

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EXISTING CONTOUR

PROPOSED BOUNDARY

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PROPOSED CONTOUR

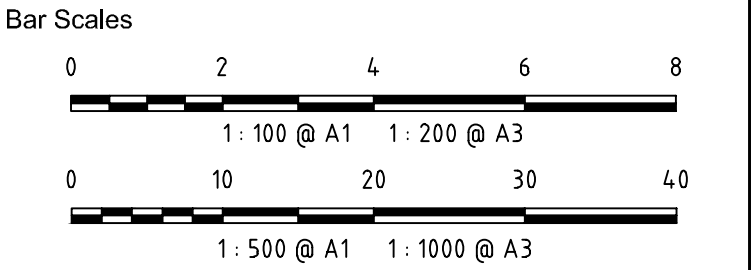
PROPOSED KERB AND GUTTER

PROPOSED STORMWATER PIPE

PROPOSED KERB INLET PIT

PROPOSED HEADWALL

PROPOSED BRIDGE DECK
REFER DWG C3040 FOR DETAILS



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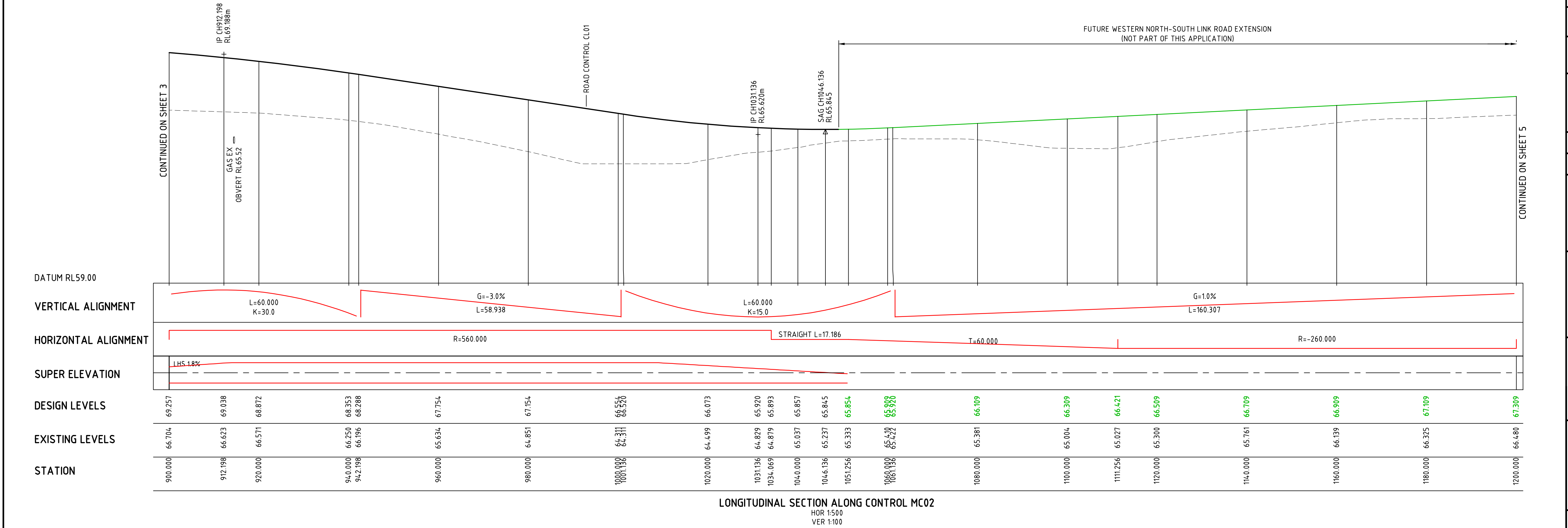
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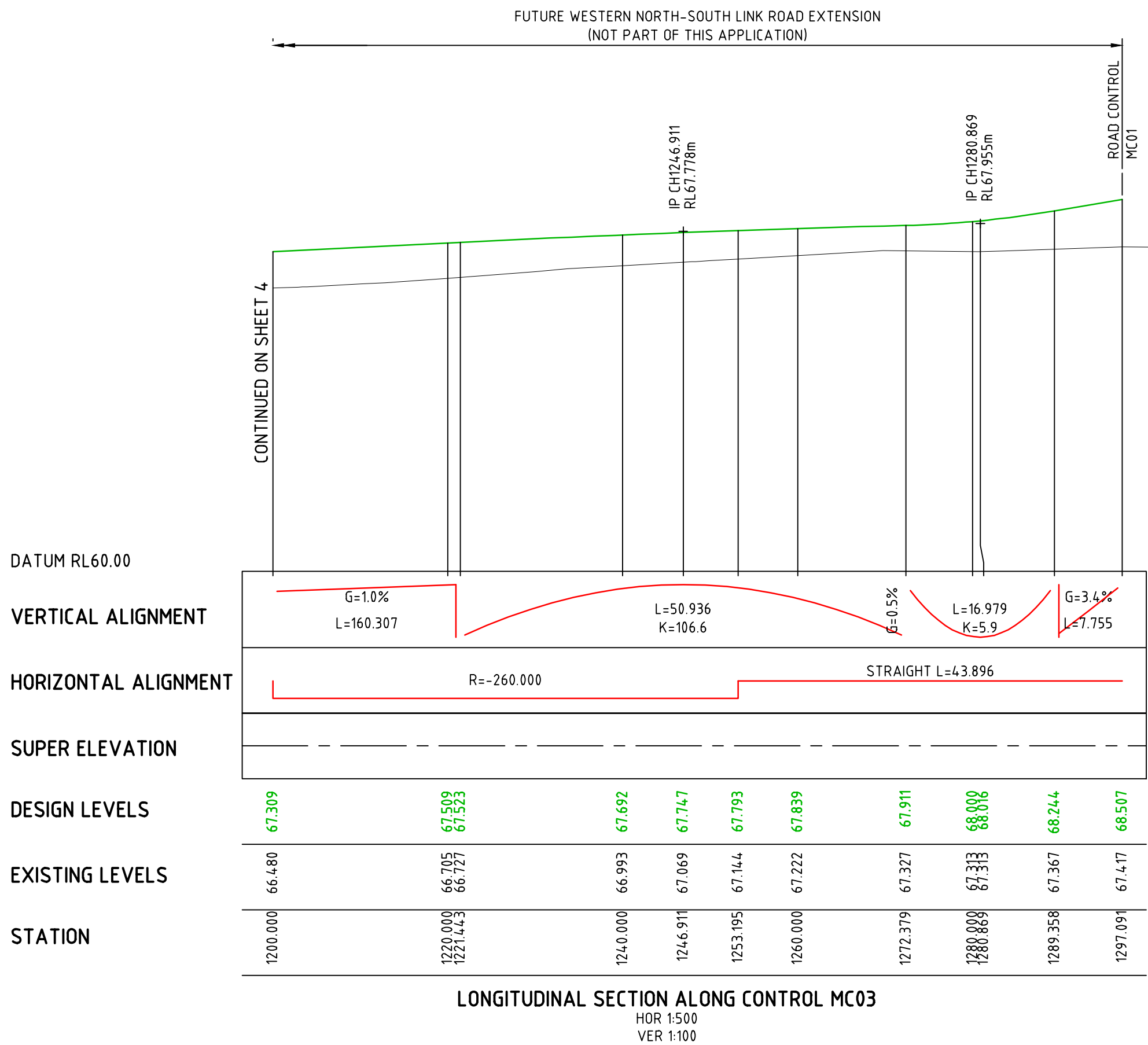
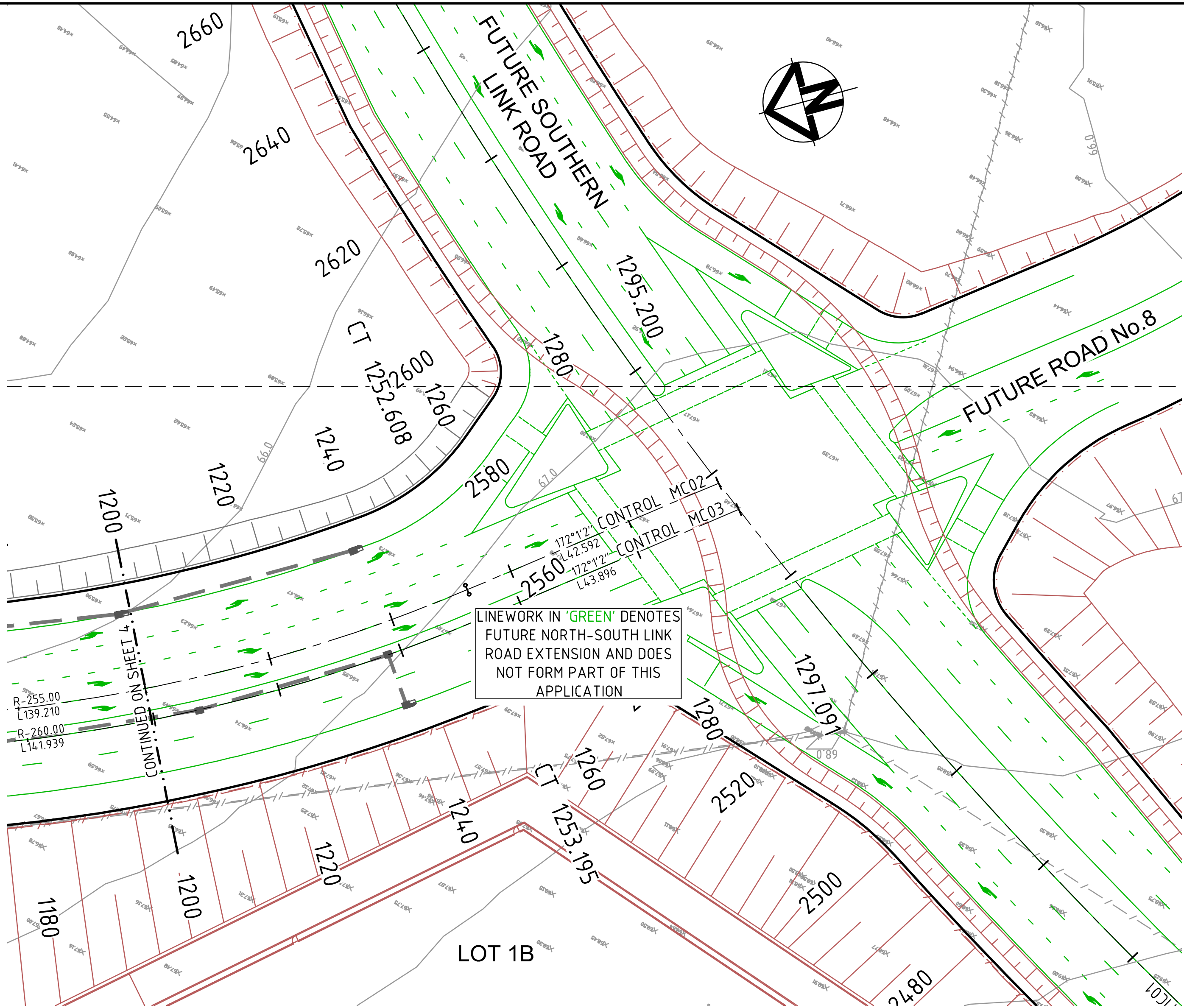
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OAKDALE WEST

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ROADWORKS PLAN AND
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SHEET 4 OF 5

Drawing No.	Project No.	Issue
15-272-C3023	15-272	P1

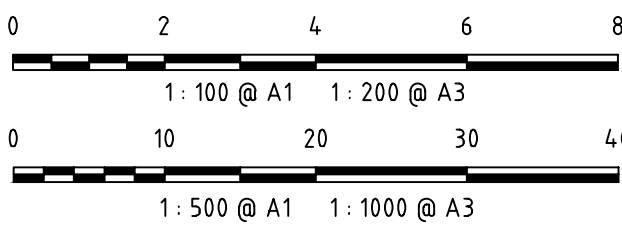




LEGEND

- EXISTING BOUNDARY
- EXISTING EASEMENT
- EXISTING CONTOUR
- PROPOSED BOUNDARY
- PROPOSED CONTOUR
- PROPOSED KERB AND GUTTER
- PROPOSED STORMWATER PIPE
- PROPOSED KERB INLET PIT
- PROPOSED HEADWALL
- PROPOSED BRIDGE DECK
REFER DWG C3040 FOR DETAILS

Bar Scales



P1 ISSUED FOR DRAFT REVIEW 8-4-16

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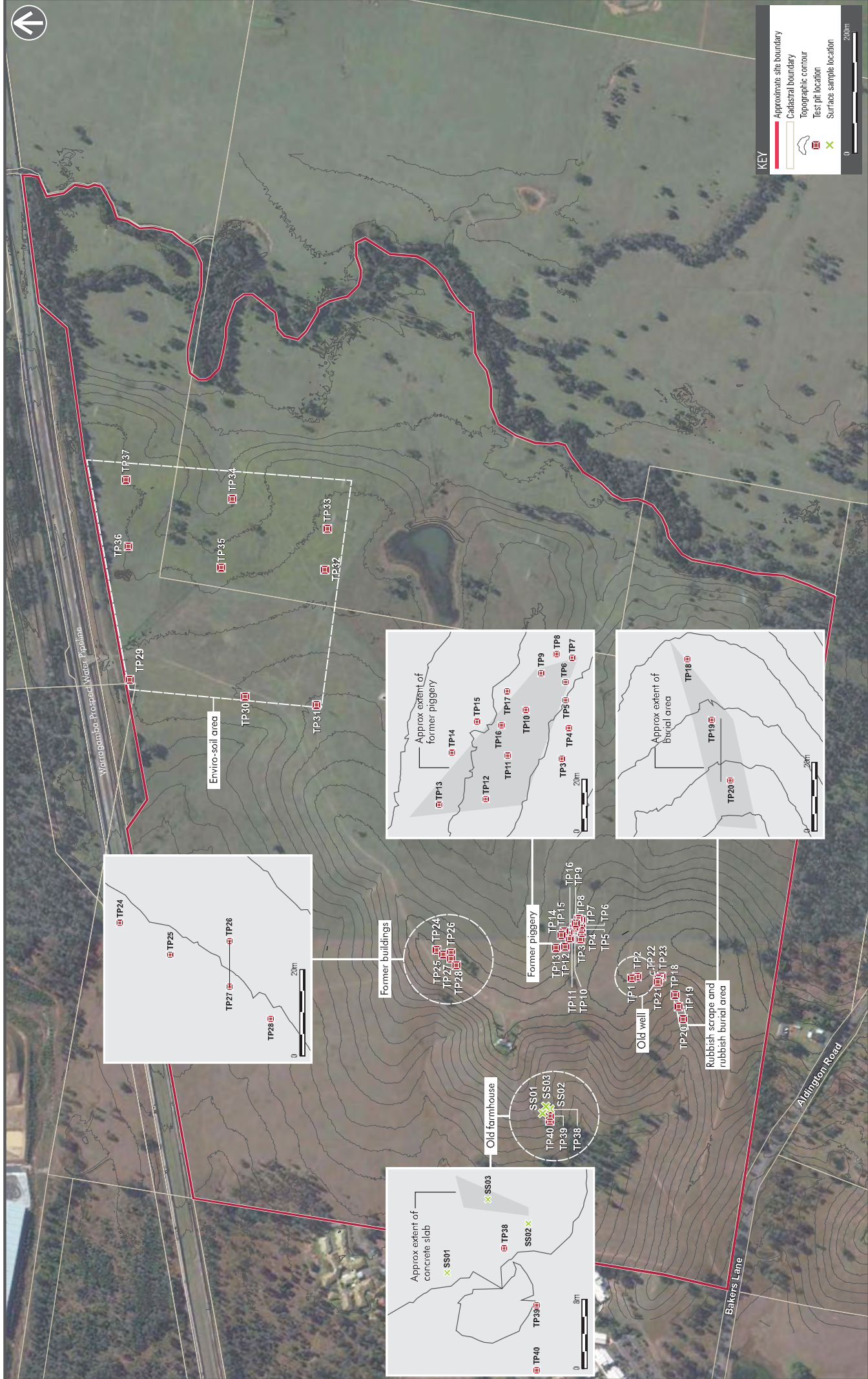
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Project
PROPOSED INDUSTRIAL DEVELOPMENT OAKDALE WEST

Title
ROADWORKS PLAN AND LONGITUDINAL SECTION SHEET 5 OF 5

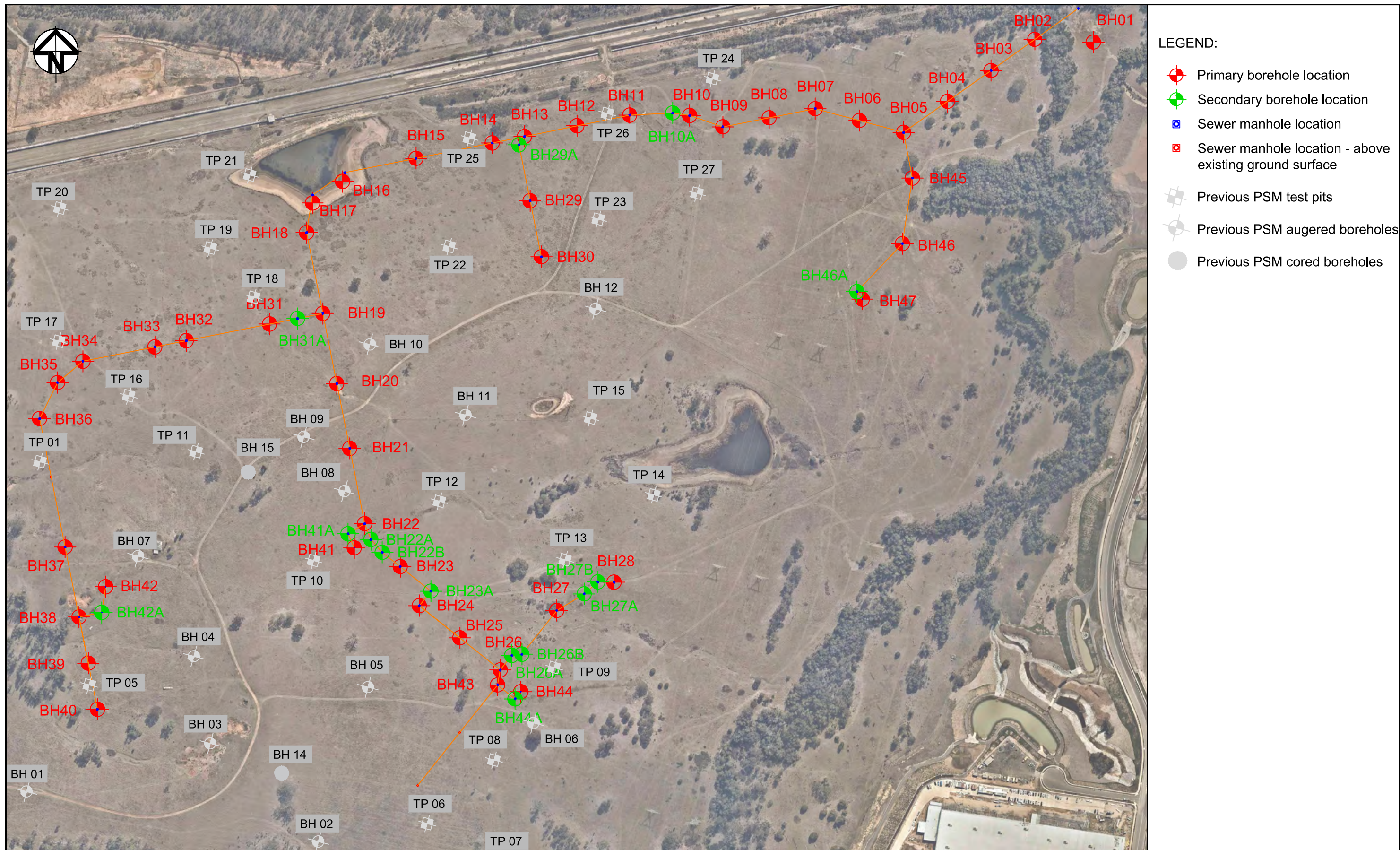
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SITE LAYOUT AND SAMPLE LOCATION PLAN
 Austral Bricks Targeted Phase 2 ESA Oakdale, Western Precinct
 Kemps Creek, New South Wales

FIGURE 2

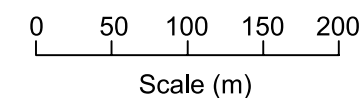




- LEGEND:
- Primary borehole location
 - Secondary borehole location
 - Sewer manhole location
 - Sewer manhole location - above existing ground surface
 - Previous PSM test pits
 - Previous PSM augered boreholes
 - Previous PSM cored boreholes

NOTES:

1. Primary boreholes are located at sewer manholes or at interim locations where manhole distance is greater than 120 m.
2. Secondary boreholes are located between manholes where distance is less than 50 m.
3. No boreholes were drilled at manhole locations where sewer level will be above existing ground surface (manholes 3-7, 6-2 and 6-3).
4. For details of previous PSM investigation, refer to PSM1541-123R.



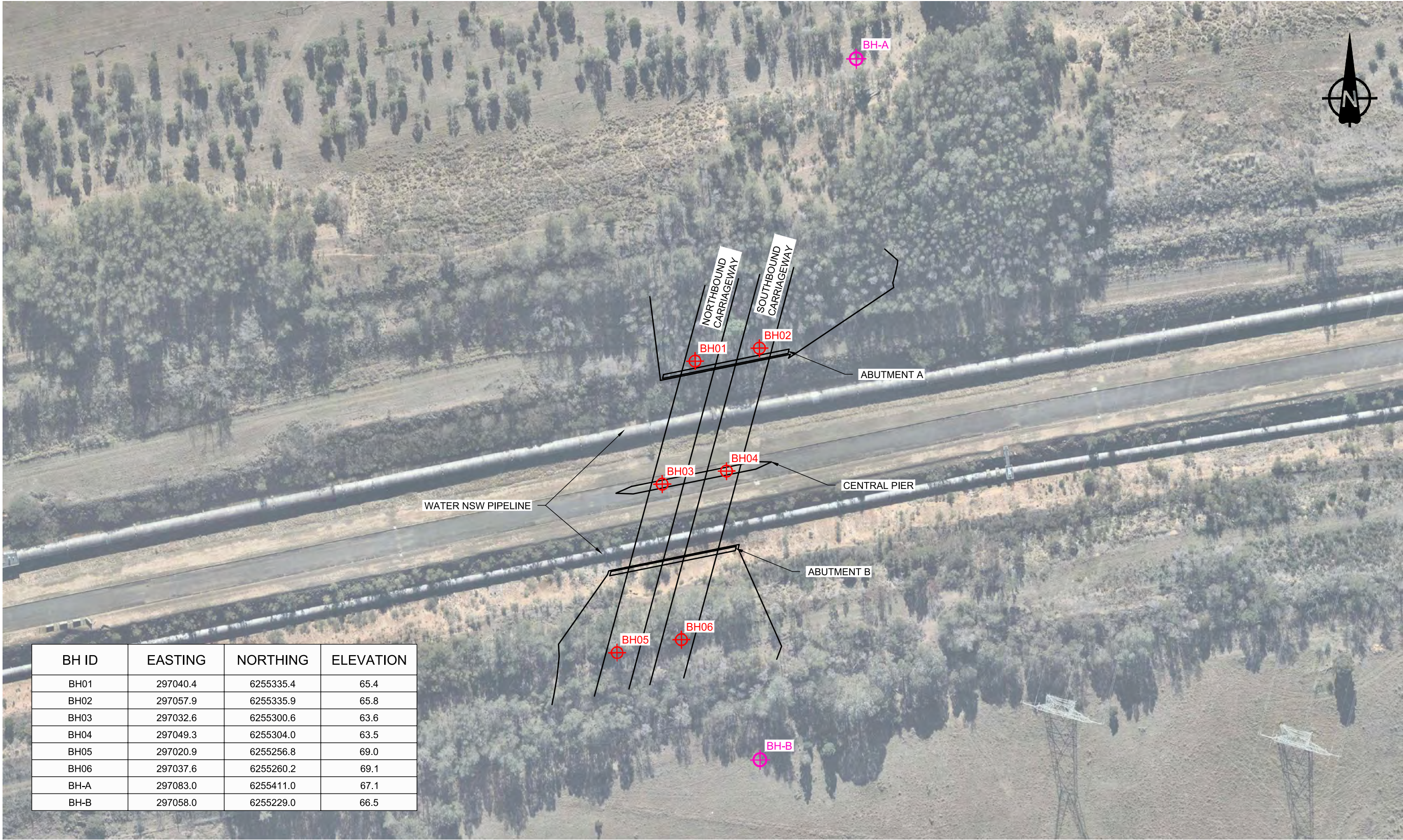
Pells Sullivan Meynink

Goodman Property Pty Ltd
Oakdale West Estate Proposed Sewer
Kemps Creek, NSW

LOCALITY PLAN

PSM1541-370L

Figure 1

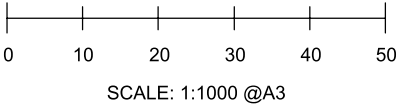


BH ID	EASTING	NORTHING	ELEVATION
BH01	297040.4	6255335.4	65.4
BH02	297057.9	6255335.9	65.8
BH03	297032.6	6255300.6	63.6
BH04	297049.3	6255304.0	63.5
BH05	297020.9	6255256.8	69.0
BH06	297037.6	6255260.2	69.1
BH-A	297083.0	6255411.0	67.1
BH-B	297058.0	6255229.0	66.5

NOTES:

1. BRIDGE LAYOUT FROM AT&L DRAWING "WNSLR BOREHOLE TESTING LOCATIONS FOR BRIDGE PIERS PLAN"
2. BOREHOLE ELEVATIONS ESTIMATED FROM CONTOURS ON AT&L DRAWING (SKC121)
3. NEARMAP IMAGERY DATED 22 JUNE 2018

- ⊕ PSM BH LOCATIONS (CURRENT INVESTIGATION)
- ⊕ PREVIOUS PSM BH LOCATIONS (REFER PSM1541-140R)



Pells Sullivan Meynink

AT&L
WESTERN NORTH-SOUTH LINK ROAD
EASTERN CREEK
BOREHOLE LOCALITY PLAN

PSM1541-367R

FIGURE 1

Appendix B

Materials Tracking Register (proformas)

MATERIALS EXCAVATION FORM

DATE.....

Material Type	Material Description	Source Location	Volume m ³	Intended Destination

Make notes on: Where and when the material is excavated, how long and where it is stockpiled. Take photos and sketch.

Stockpile Materials Tracking System Form

Location of Stockpile (tick one below)

Within bunded work area, designated area (stockpile grid number or excavation number...)	
--	--

The stockpile status/classification: (tick one below)

Import	
Closed – quarantined	
Export	

The material type:

The origin (excavation or another stockpile) of material in the stockpile:

The stockpile volume:

The destination (including intended end use) of material in the stockpile:

For characterization	
Backfill	
Another stockpile (describe)	
Off-site landfill	

Validation samples collected from the stockpile (as appropriate).

MATERIALS PLACEMENT FORM

[illegible]

MATERIALS OFF-SITE TRANSFER FORM

[illegible]

APPENDIX U

Bushfire Protection Assessment

BUSHFIRE PROTECTION ASSESSMENT

FOR THE PROPOSED

**OAKDALE INDUSTRIAL ESTATE - WEST
ON**

LOT 11 in DP 1178389

KEMPS CREEK

FOR

GOODMAN PROPERTY SERVICES (AUST) PTY LTD

September 2016.



Australian Bushfire Protection Planners Pty Limited

ACN 083 085 474

32 Old Dog Trap Road

SOMERSBY 2250 NSW

Phone: (02) 43622112 Fax: (02) 43622204

Email: abpp@bigpond.net.au

BUSHFIRE PROTECTION ASSESSMENT

FOR THE PROPOSED

OAKDALE INDUSTRIAL ESTATE - WEST

ON

LOT 11 in DP 1178389

KEMPS CREEK

FOR

GOODMAN PROPERTY SERVICES (AUST)

PTY LTD

Assessment Number	Document	Preparation Date	Issue Date	Directors Approval
B152559 - 2	Final	30.2.2016	13.9.2016	<i>G.L. Swain</i>

EXECUTIVE SUMMARY

Australian Bushfire Protection Planners Pty Limited, at the request of *Goodman Property Services (Aust) Pty Ltd*, has undertaken the bushfire consultancy to inform the State Significant Development Application [SSDA] for the staged development of the Oakdale West Estate [OWE] on the bushfire protection measures required for the development of the proposed Oakdale West Estate [OWE] on Lot 11 in DP 1178389 Kemps Creek, here-in known as the 'development site'.

The proposed OWE development aims to integrate with the broader Oakdale Estate to create a high quality warehouse and logistics estate which maximises the employment generating potential of the land to create an efficient, attractive and high quality employment zone for Western Sydney.

To this end, the core objectives of the OWE proposal are to:

- Secure developable areas and high level development controls to provide certainty and minimise risk in the future development of the site;
- Resolve uncertainties in the location and alignment of key road infrastructure to allow for more timely delivery;
- Allow for the staged development of the site over time in line with infrastructure delivery and market demand;
- Facilitate earthworks and infrastructure/services development on the land concurrently with the delivery of regional road infrastructure; and
- Secure approval for the first stage of development within the site to allow for a timely response to enquiry as infrastructure issues are resolved.

The SSDA for OWE incorporates:

- ❖ A **Master Plan** to guide the staged development of the OWE including:
 - An Indicative Master Plan and Development Master Plan;
 - Development Controls;
 - Landscape Concept Plan;
 - Biodiversity Offsets.
- ❖ **Stage 1 Development** to be implemented in stages including:

Estate Works for the entire OWE comprising:

- Site preparation and mobilisation including clearing of land and importation of fill material;
- Earthworks and support structures (batters and retaining walls);
- Estate stormwater management including construction of detention basins;
- Realignment and rehabilitation of creek and riparian land;
- Landscaping and public domain works to estate roads, estate entrance and key nodes;
- Land stabilisation and rehabilitation;
- Environmental protection and management measures; and
- Subdivision aligned with infrastructure and servicing.

Development of Stage 1 Precincts comprising:

- Construction of site access, estate roads and utility infrastructure and connection of services (Stage 1 only);
- On-lot stormwater, infrastructure and services;
- Construction and fit out of buildings;
- Construction of hardstand, loading and car parking;
- Landscaping and signage; and
- Use of buildings for generic warehousing and distribution uses.

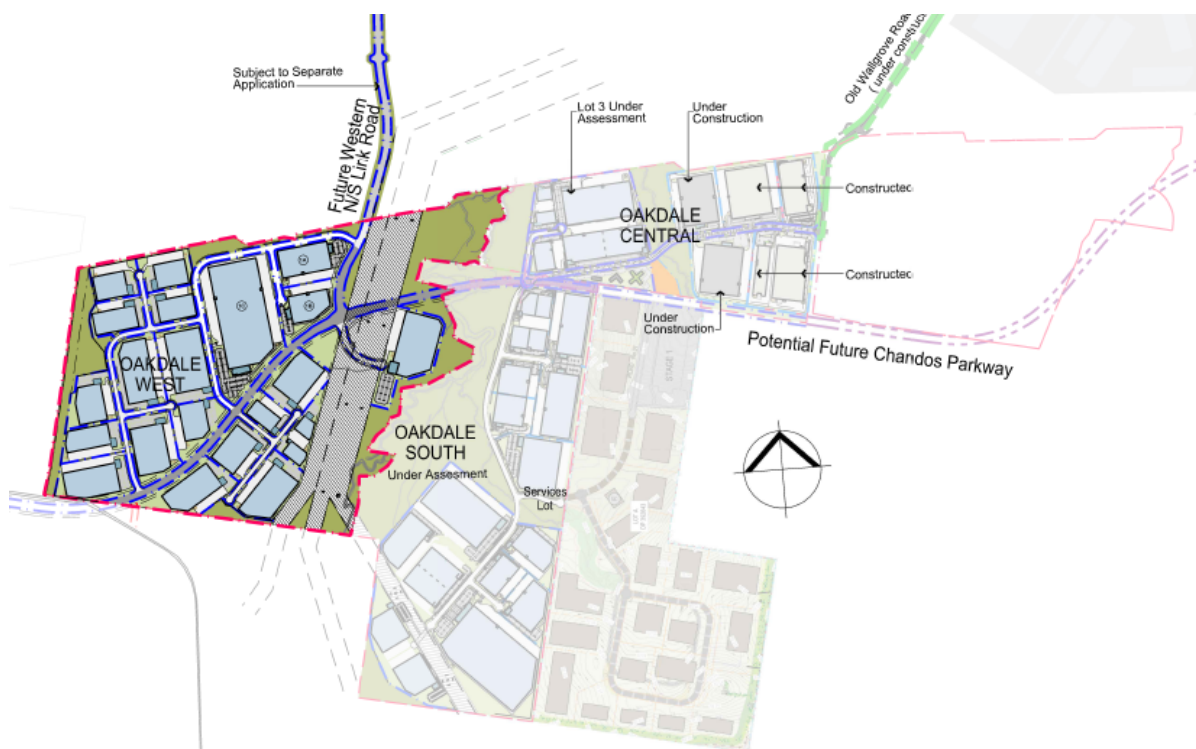
The SEARS [Secretary's Environmental Assessments Requirements] for Oakdale South were issued on the 26th November 2015 and contain a requirement that the EIS for the Master Plan and Stage 1 works must address bushfire – including consideration of bushfire measures as outlined in *Planning for Bushfire Protection 2006*, particularly asset protection zones, access and water utilities.

The site on which it is proposed to construct the new Oakdale West Estate comprises 154 hectares of land within the Western Sydney Employment Area [WSEA] and is owned by a Joint Venture (JV) between Goodman and Brickworks Limited (Brickworks, parent company of the Austral Brick Company Pty Ltd).

Goodman has entered into a JV with Brickworks to develop the Oakdale Estate into a regional warehousing and distribution hub.

The site is known as Oakdale West and comprises the third stage of four stages within the broader 'Oakdale Estate' under the management of Goodman Limited [Goodman] – refer to Figure 1 – Oakdale Estate.

Figure 1 – Oakdale Estate



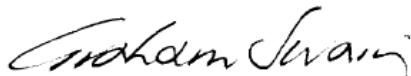
The development site is an irregular shaped parcel which is mainly located to the west of Ropes Creek. The development site is largely zoned IN1 – General Industrial under the WSEA SEPP but also includes large areas of land zoned E2 – Environmental Protection, associated with the Ropes Creek riparian corridor.

The Penrith Council Bushfire Prone Land Map indicates that the Kemps Creek corridor contains Category 1 Bushfire Prone Vegetation with Category 1 vegetation occupying the land to the south and west of the site. The vegetation within the site is mapped as Category 2 Bushfire Prone Vegetation.

Therefore, this report undertakes an assessment to examine the measures required to minimise bushfire risk on the proposed development and determines the deemed-to-satisfy bushfire protection requirements in accordance with the provisions of *Planning for Bushfire Protection 2006* and provides recommendations on the provision of Asset Protection Zones [Defendable Spaces] to the future buildings in the Oakdale West Estate.

This report also assesses the adequacy of fire-fighting access and water supplies; construction standards of the buildings, the management of the Asset Protection Zones [Defendable Spaces] and evacuation protocols necessary to address the bushfire risk to the proposed development and to address the aim and objectives of *Planning for Bushfire Protection 2006*.

The report has found that no modifications are required to the development proposal in order to address the provision of defendable spaces [Asset Protection Zone] to the buildings; the provision of access and water supplies for fire-fighting operations.



Graham Swain,
Managing Director,
Australian Bushfire Protection Planners Pty Limited

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SECTION 1

INTRODUCTION

1.1 Development Proposal.

The proposal seeks to facilitate the staged development of the Oakdale West Estate [OWE] through a staged SSDA process. The SSDA for Oakdale South comprises an overarching planning framework to guide the staged development of the OSE including:

- An Indicative Master Plan and Development Master Plan;
- Development Controls;
- Landscape Concept Plan;
- Biodiversity Offsets.

Stage 1 Development to be implemented in stages including:

Estate Works for the entire OWE comprising:

- Site preparation and mobilisation including clearing of land and importation of fill material;
- Earthworks and support structures (batters and retaining walls);
- Estate stormwater management including construction of detention basins;
- Realignment and rehabilitation of creek and riparian land;
- Landscaping and public domain works to estate roads, estate entrance and key nodes;
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- Construction of hardstand, loading and car parking;
- Landscaping and signage; and
- Use of buildings for generic warehousing and distribution uses.

Refer to Figure 2 – Estate Master Plan Oakdale West Estate on Page 10.

Refer to Figure 3 – SSDA Building Staging Plan on Page 11 and Figure 4 – Ultimate Lot Layout Plan on Page 12.

Refer to Figure 5 – SSDA Stage 1 Development Plan – Precinct 1 on Page 13 and Figure 6 – Precinct 1 Plan on Page 14.

Figure 2 – Estate Masterplan of the Oakdale Industrial Estate – West



Figure 3 – SSDA Building Staging Plan



Figure 4 – Indicative Ultimate Lot Layout.

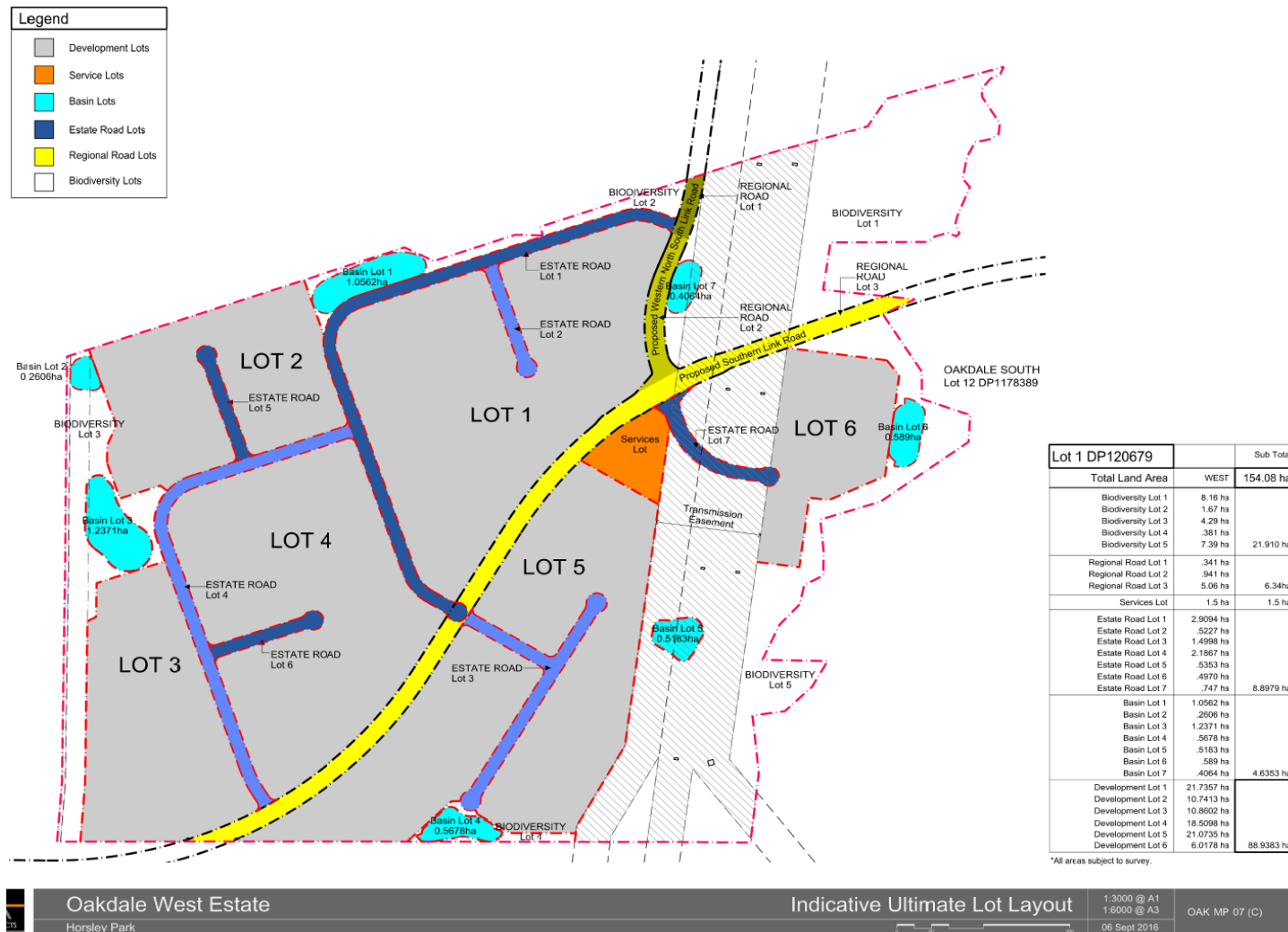


Figure 5 – SSDA Stage 1 Development – Precinct 1.

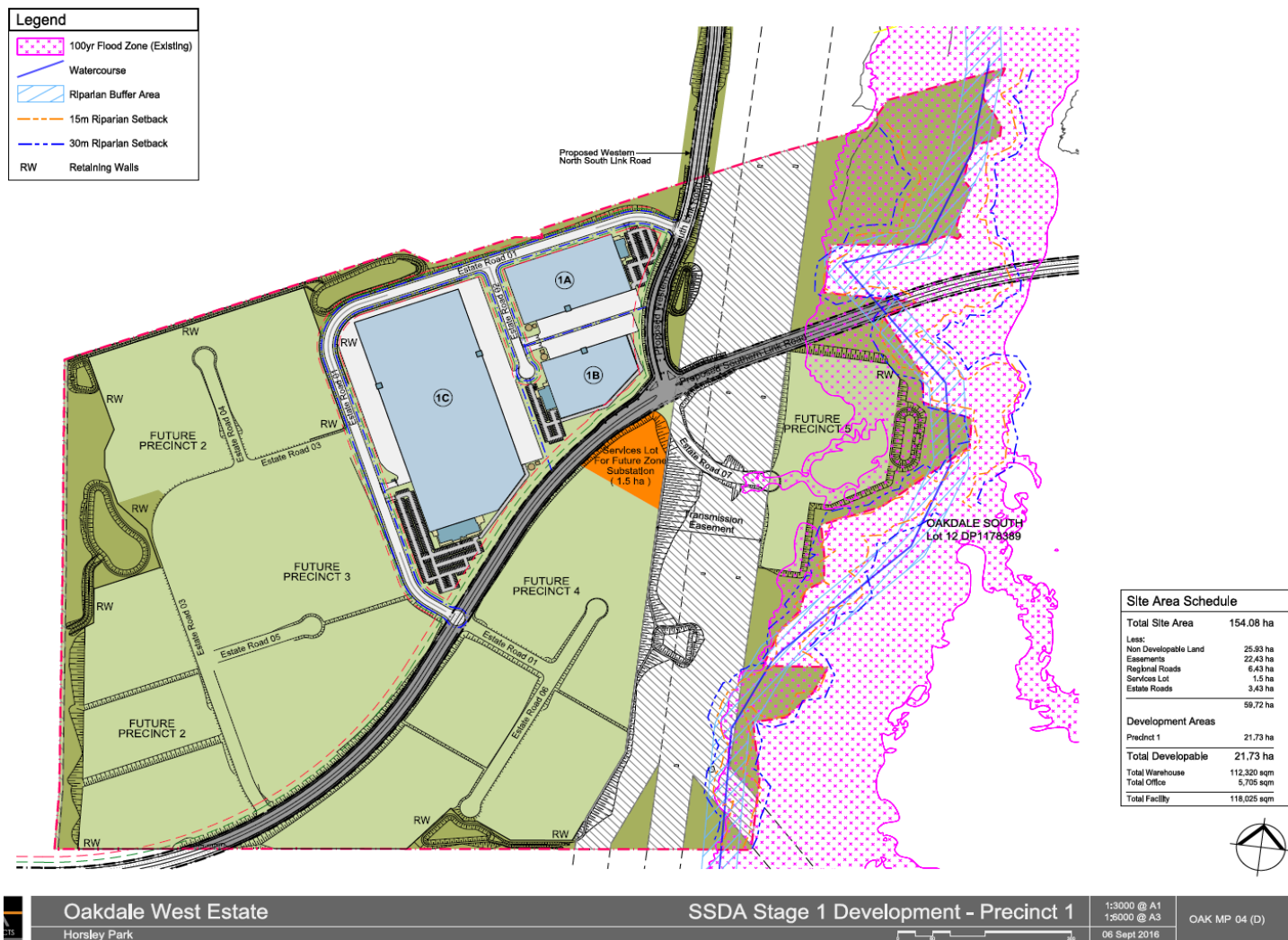
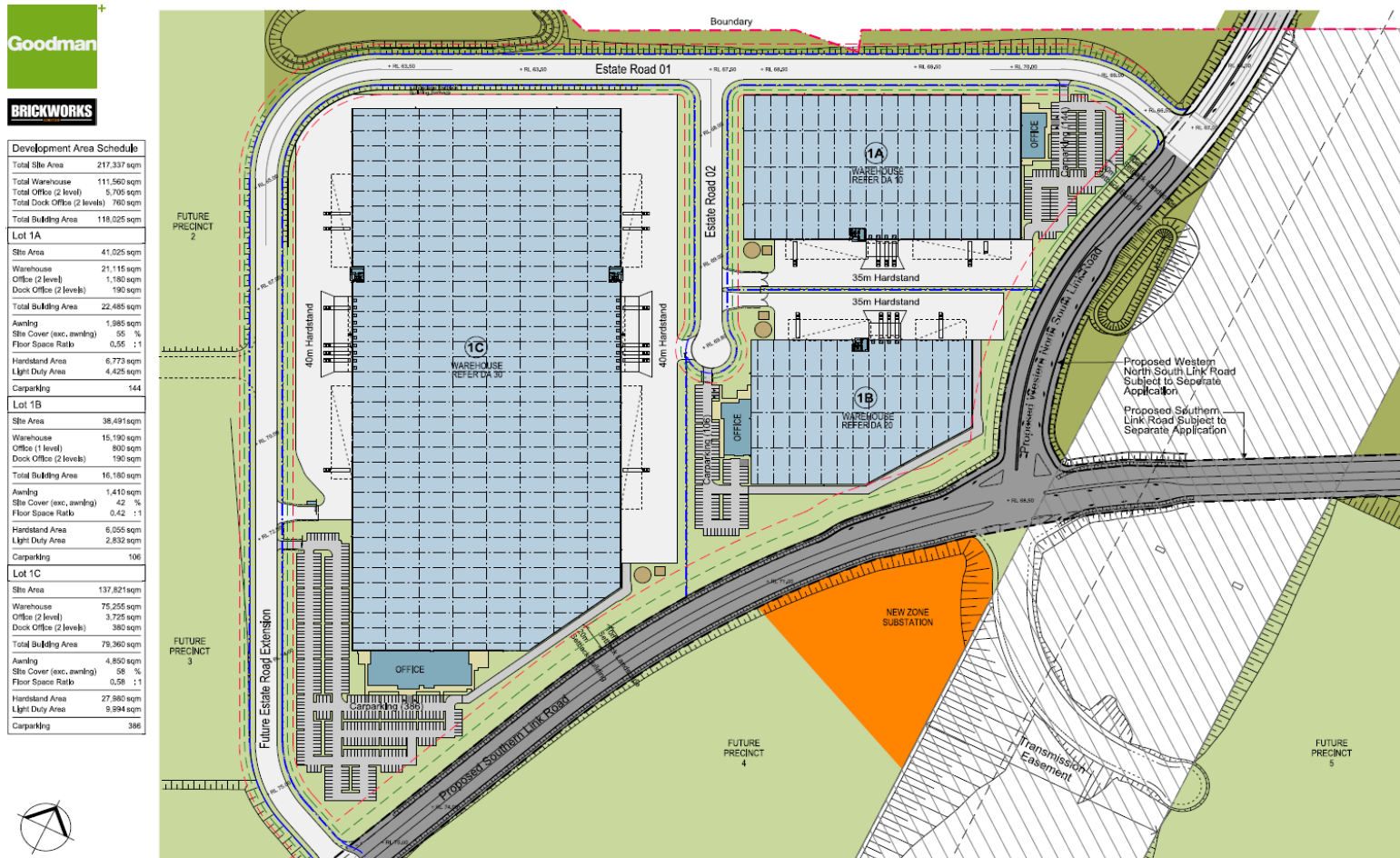


Figure 6 – Precinct 1 Plan



Oakdale West Estate
Horsley Park

Precinct 1 Plan

1:1250 @ A1
1:2500 @ A3
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1.2 Aim of this Report.

The aim of this Bushfire Protection Assessment is to address the requirements of the Secretary's Environment Assessment Requirements [SEARS] issued on the 26th November 2015, including consideration of bushfire measures as outlined in *Planning for Bushfire Protection 2006*, particularly asset protection zones, access and water utilities.

To achieve the specific bushfire requirement of the SEARS the following will be examined:

- Determine the classification of the vegetation on and surrounding the site in accordance with the vegetation classification system contained in *Planning for Bushfire Protection 2006*;
- Undertake an assessment to determine the slope of the land on and surrounding the development site;
- Undertake a Bushfire Protection Assessment to determine bushfire protection strategies for the proposed development that address the following matters:
 - (i) The provision of building setbacks (Defendable Space) from vegetated areas and the siting of buildings to minimize the impact of radiant heat and direct flame contact;
 - (ii) Fire fighting water supplies;
 - (iii) Access requirements for emergency service vehicles;
 - (iv) Construction standards to be used for the future buildings within the proposed development to minimize the vulnerability of buildings to ignition from radiation and ember attack;
 - (v) Land management responsibilities; and
 - (vi) Evacuation management.

1.3 Statutory Requirements.

This assessment has been prepared having regard to the following legislative and planning requirements:

1.3.1 Legislation.

(a) *Environmental Planning and Assessment Act - 1979 (EPA Act)*

Planning and development within NSW is regulated by the *Environmental Planning & Assessment Act, 1997* (EPA Act). In relation to bushfire planning for new developments (including Industrial Development) in bushfire prone areas in NSW, the following sections of the EPA Act apply:

- (i) Section 79BA requires a consent authority to determine if a proposed development that is located within a designated Bushfire Prone Area or the buffer zone to the Bushfire Prone Land complies with *Planning for Bushfire Protection 2006*;
- (ii) Section 79C(1) states “*In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:*
 - *The likely impacts of the development (e.g. natural hazards such as bushfire threat);*

The suitability of a site for development (e.g. bushfires

1.3.2 Planning Policies.

Planning for Bushfire Protection – 2006. [Rural Fire Service]

This document provides guidance on the planning and development control processes in relation to bushfire protection measures for rural residential and residential subdivision, “*Special Fire Protection*” and Class 5 – 8 and 10 buildings in bushfire prone areas [Industrial buildings are Class 7 as defined by the Building Code of Australia].

These measures include the provision of defensible space requirements and access/water supply provisions to Class 5 – 8 & 10 developments in bushfire prone areas.

Provision for the assessment of construction standards to buildings and management / maintenance of the Asset Protection Zones/defensible space to buildings is also provided.

1.4 Documentation reviewed in this Assessment.

To achieve the aim of this report, a review of information relevant to the property and proposed development was undertaken. Information sources reviewed included the following documents:

- Secretary’s Environmental Assessment Requirements – 26 November 2015;
- State Significant Development Application for Oakdale West Industrial Estate prepared by Urban Advisory Services;
- Master Plan; Precinct 1 Plan and Building Plans for Building 1A; 1B & 1C Oakdale West prepared by SBA Architects – September 2016;
- Site Constraints Plan prepared by AT&L – Project No. 15 – 272 dated 7.10.2015;
- Ecological Assessment undertaken by Cumberland Ecology;

- *Planning for Bushfire Protection 2006* prepared by the NSW Rural Fire Service/Planning N.S.W;
- Australian Standard AS3959 - 2009 *Construction of Buildings in Bushfire Prone Areas*;
- *Rural Fires Regulation 2013*;
- Penrith City Council *Certified Bushfire Prone Land Map*.

1.5 Site Inspection.

Graham Swain of ***Australian Bushfire Protection Planners Pty Limited*** inspected the development site on the 15th of July 2015 to assess the topography, gradients of the land within and external to the site and vegetation classification within and adjoining the development property, existing bushfire mitigation measures and a visual assessment of bushfire threat.

The land adjoining the development site was also inspected to determine the surrounding land use / land management practices and extent of bushfire prone vegetation.

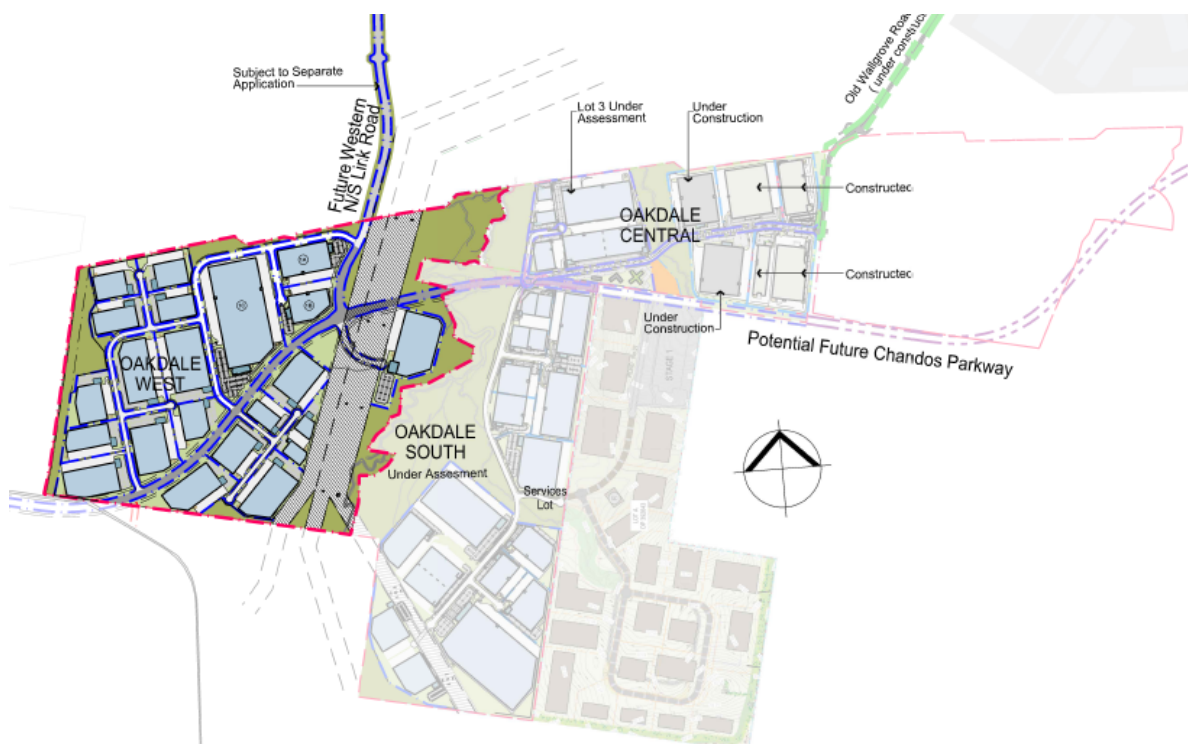
SECTION 2

PROPERTY DESCRIPTION

2.1 Location.

The development site occupies Lot 11 in DP 1178389 Kemps Creek and is located in the Local Government Area [LGA] of Penrith City Council.

Figure 7 – Location of Development Site.



2.2 Existing Land Use.

The development site contains vacant grazing land used for agricultural purposes. High voltage transmission line easements traverse the eastern portion of the site.

2.3 Surrounding Land Use.

The landuse adjoining the boundaries of the development site is as follows:

(a) North

The land to the north of the development site contains the Sydney Catchment Authority water pipeline easement.

Beyond the pipeline easement the land contains existing industrial development and vacant grazing land used for agricultural purposes. This land is zoned IN1 General Industrial under the WSEA SEPP.

(b) East

The land adjoining the eastern boundary of the development site forms the Oakdale Central and Oakdale South Estates and is zoned IN1 General Industrial under the WSEA SEPP.

(c) South

The land adjoining the southern boundary of the development site consists of rural residential development. This land is zoned IN1 General Industrial under the expansion to the WSEA.

(d) West

The land to the west of the Oakdale West development site contains the Emmaus Catholic College, Trinity Catholic Primary School and Emmaus Village [Retirement Village and Community Home].

Refer to Figure 8 – Aerial Photograph below.

Figure 8 – Aerial Photograph of the Oakdale West Development Site showing adjoining landuse



2.4 Topography.

Appendix 2 of *Planning for Bushfire Protection 2006* states that slopes should be assessed, over a distance of at least 100m from a development site and that the gradient of the land should be determined which will most significantly influence the fire behaviour on the site.

➤ ***Within the Development Site.***

The topography within the eastern portion of the development site is undulating, falling to the east/northeast at less than 5 degrees towards Ropes Creek.

The topography within the western portion of the development site is undulating, falling to the west/northwest towards the head of a tributary to South/Wianamatta Creek.

➤ ***Beyond the Development Site.***

(a) North.

The topography of the land to the north of the development site falls to the east, towards Ropes Creek and to the west into a tributary of South/Wianamatta Creek

(b) East.

The topography of the land to the east, within Oakdale East and Oakdale South is undulating, rising to the east at less than 5 degrees.

(c) South.

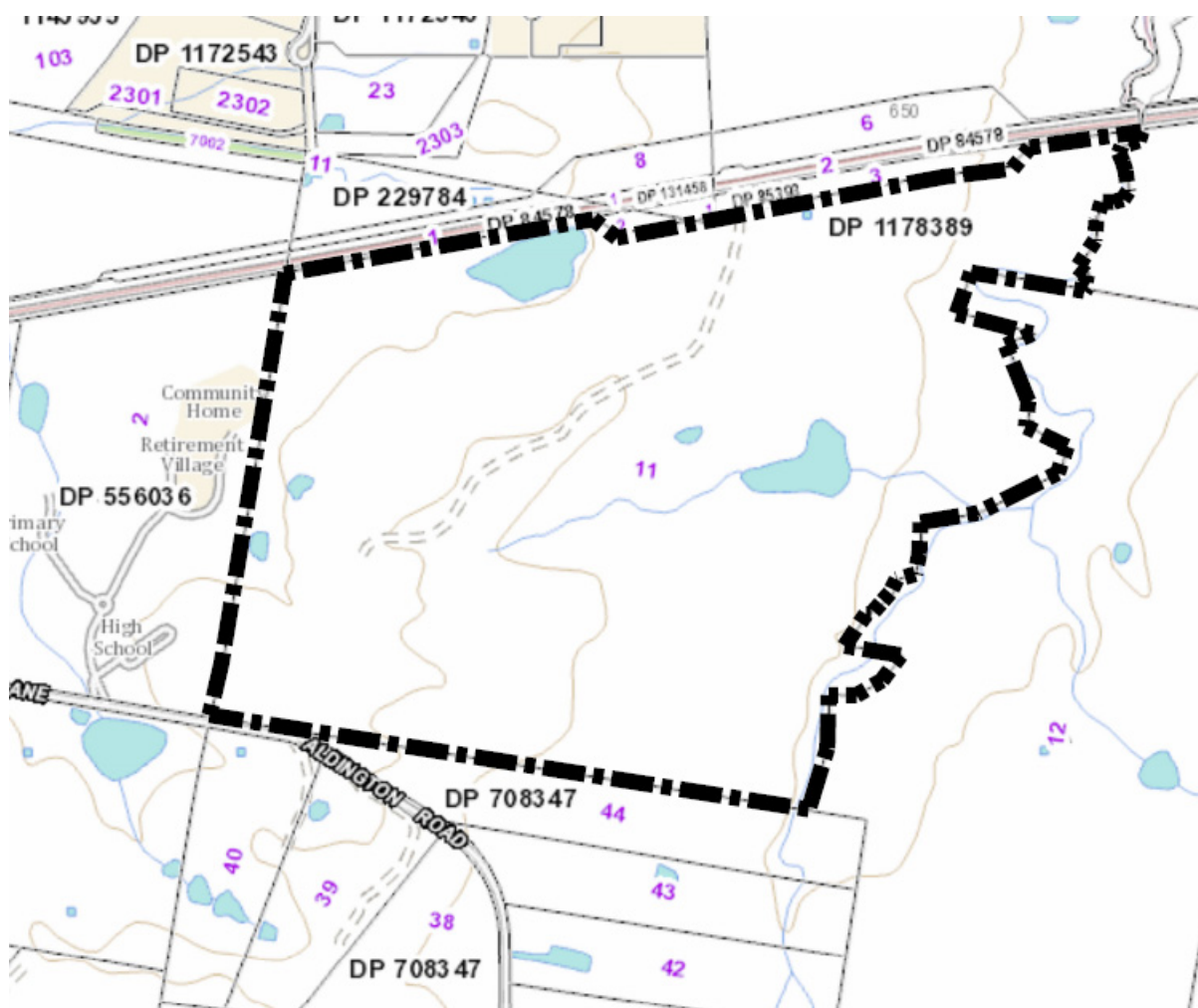
The topography of the land to the south of the development site continues the ridgeline within the site to the southwest, falling to the northwest across Bakers Lane and to the east towards Ropes Creek.

(d) West.

The topography of the land to the west of the development site, within the College and Retirement Village, falls to the northwest at less than 5 degrees.

Refer to Figure 9 – Topographic Map on Page 21.

Figure 9 – Topographic Map of development site and adjoining lands.



2.5 Vegetation within the Development Site.

Appendix A2.3 of *Planning for Bushfire Protection 2006* provides a methodology for determining the predominant bushfire prone vegetation for at least 140 metres in all directions from the buildings. Vegetation is classified using Table A2.1 of *Planning for Bushfire Protection 2006*, which classifies vegetation types into the following groups:

- (a) Forests [wet & dry sclerophyll forests];
- (b) Woodlands;
- (c) Plantations – being pine plantations not native plantations;
- (d) Forested Wetlands;
- (e) Tall Heaths;
- (f) Freshwater Heaths;
- (g) Short Heaths;
- (h) Alpine Complex;
- (i) Semi – arid Woodlands;
- (j) Arid Woodlands; and
- (k) Rainforests.

The ecological study undertaken by Cumberland Ecology states:

‘Native vegetation comprises approximately 4% of the vegetated cover of the development site.

The majority of the development site is cleared for agriculture and is dominated by exotic pasture grasses. Native vegetation within the development site is primarily limited to small remnant patches and sparsely scattered trees through the paddocks. There are also areas of regenerating woodland that connect to larger patches of woodland to the west and south of the development site. These regenerating areas largely comprise of juvenile, regenerating E. tereticornis but the understorey in these patches is largely absent due to heavy grazing by cattle and Eastern Grey Kangaroo.

The condition of vegetation across the whole development site is degraded due to persistent impacts from grazing even within areas of native vegetation, the ground layer is frequently dominated by exotic species, and the shrub layer is almost absent’.

In addition to exotic and native grasses, the three main plant communities that occur on the Oakdale West development site are Swamp Oak Floodplain Forest [TSC Act Listed], Cumberland Plain Woodland [EPBC & TSC Act listed] and Wetland vegetation associated with farm dams.

The Estate Master Plan identifies the retention of a narrow corridor of woodland vegetation along the western boundary of the site.

Refer to Figure 10 – Plan of Vegetation Communities on Page 24.

2.6 Vegetation within 140 metres of the Development Site.

(a) North.

The land to the north contains pasture grass with scattered shade trees.

(b) East.

The adjoining Oakdale South Estate Swamp Oak in the Ropes Creek riparian corridor and pasture grass with scattered shade trees. The latter vegetation will be removed as part of the development of the Oakdale South development.

The gazetted E2 zoned land in the creek corridor will regenerate to form a forest community having a width of approximately 250 – 300 metres.

(c) **South.**

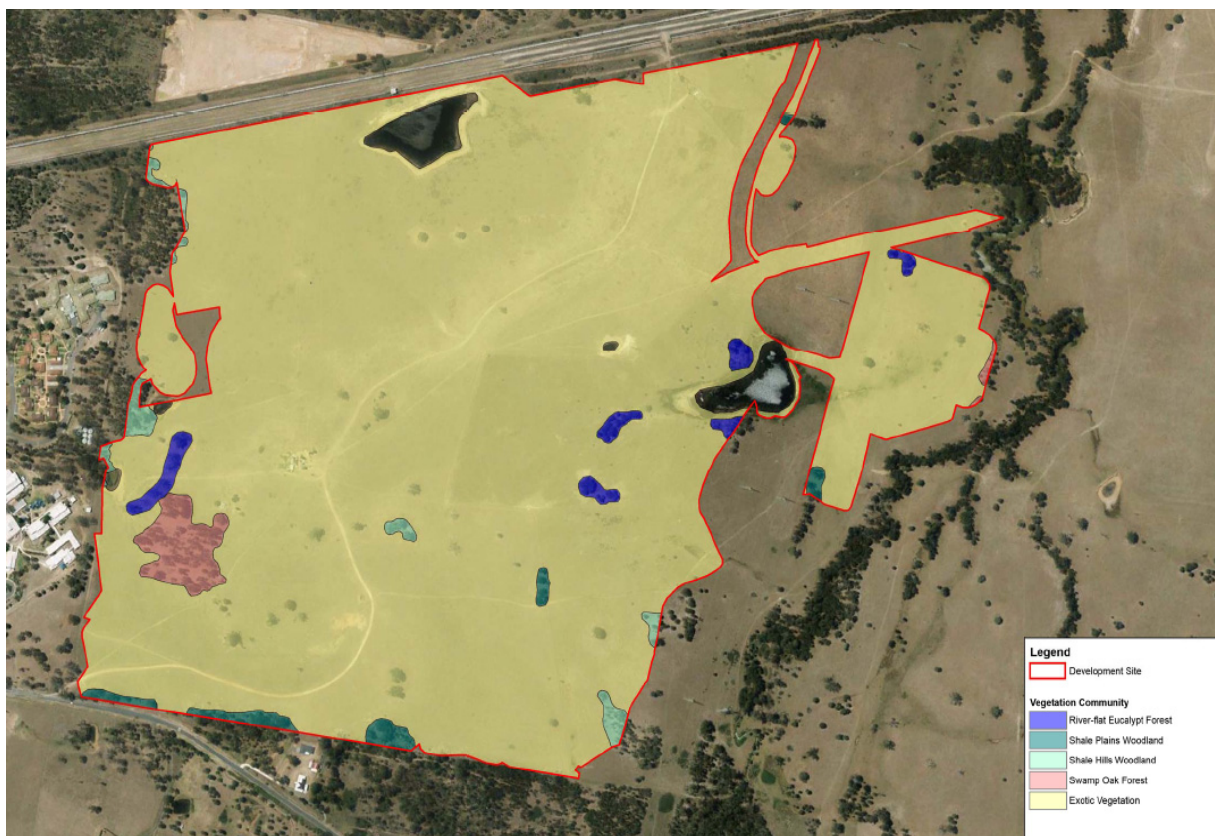
The adjoining rural residential land contains pasture grass with scattered shade trees.

(d) **West.**

The College and Retirement complexes to the west of the development site contain managed landscaped gardens with remnant Cumberland Plain shade trees.

The vegetation on the land to the west of the north-western corner of the development site consists of Cumberland Plain Woodland. This vegetation connects to the proposed corridor of Cumberland Plain Woodland running along the western boundary of the development site.

Figure 10 – Plan of Vegetation Communities within the development footprint



Source: Cumberland Ecology

2.7 Significant Environmental Features within the Development Site.

The development site does not contain significant environmental features such as SEPP 44 Koala Habitat; SEPP 14 Wetlands; SEPP 26 Littoral Rainforests; land slip areas or National Parks Estate or areas of geological interest.

E2 Environmental Protection zone is designated in the SEPP for Ropes Creek.

2.8 Known Threatened Species, Population or Ecological Community on the Development Site.

Swamp Oak Floodplain Forest [TSC Act Listed] and Cumberland Plain Woodland [EPBC & TSC Act listed] were found within the development site and retained in the E2 zoned land along Ropes Creek.

2.9 Details and location of Aboriginal Relics or Aboriginal Place.

There are no known Aboriginal relics or Aboriginal places on the development site.

SECTION 3

FIRE MANAGEMENT RESPONSIBILITIES

Fire management within the development site is the responsibility of:

3.1 Penrith City Council.

Penrith Council has responsibility, under Section 63(1) of the *Rural Fires Act*, to take notified steps and any other practicable steps to prevent the occurrence of bush fires on, and to minimise the danger of the spread of fire on or from:

- (a) Any land vested in or under its control or management, or
- (b) Any highway, road, street, land or thoroughfare, the maintenance of which is charged on the authority.

Section 63(3) identifies that the public authority is liable for the costs incurred by it in performing the duty imposed by Section 63(1).

Section 100E of the *Rural Fires Act* requires Council to issue bushfire hazard reduction certificates for hazard reduction to be undertaken on private lands.

3.2 New South Wales Rural Fire Service.

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. *Section 73* of the *Rural Fires Act (1997)* enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

3.3 Fire & Rescue New South Wales.

Fire & Rescue NSW has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation and through Mutual Aid Agreements, provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Hazmat management within New South Wales is the responsibility of Fire & Rescue NSW.

3.4 Penrith Bush Fire Management Committee.

The Penrith Bushfire Management Committee has the responsibility for planning for co-ordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organization, a fire fighting organization or a funding source for fire management activities.

The Bush Fire Management Committee is supported by the following provisions of the Rural Fires Act 1997:

- **Section 52** requires each Bush Fire Management Committee to prepare a draft bush fire management plan for their local areas which includes a plan of operations and a bush fire risk management plan.
- **Section 54** of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'. A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

3.5 Public Authorities & owners/occupiers of land.

The Rural Fires Act, 1997 provides several legislative opportunities to require Public Authorities, land owners and occupiers to manage hazardous fuels.

These are listed below:

63 Duties of public authorities and owners and occupiers of land to prevent bush fires

- (2) It is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of bush fires on, and to minimise the danger of the spread of bush fires on or from, that land.
- (3) A public authority or owner or occupier is liable for the costs incurred by it in performing the duty imposed by this section.
- (4) The Bush Fire Co-ordinating Committee may advise a person on whom a duty is imposed by this section of any steps (whether or not included in a bush fire risk management plan) that are necessary for the proper performance of the duty.

In this section **notified steps** means:

- (a) any steps that the Bush Fire Co-ordinating Committee advises a person to take under subsection (4), or
- (b) any steps that are included in a bush fire risk management plan applying to the land.

66 Bush Fire Hazard Reduction Notice

- (1) A hazard management officer may, by notice in writing, require the owner or occupier [not being a public authority] of any land to carry out bushfire hazard reduction work specified in the notice on the land.
- (2) A hazard management officer must serve a notice under this section if required to do so by a bushfire risk management plan applicable to the land that is in force.
- (3) A hazard management officer must issue a bushfire hazard reduction certificate in respect of any bushfire hazard reduction work required by a notice issued in accordance within section (2) unless the work required by the notice:

 - Is otherwise authorised to be carried out, or
 - Is not required to be authorised to be carried out under this or any other Act.
- (6) The requirements and conditions so specified must include any requirements in a bushfire risk management plan that is applicable to the land and is in force and may include a requirement or condition that the burning of fire breaks or of combustible material:

 - (a) must in fire district constituted under the Fire Brigades Act 1989 be carried out by or under the supervision of the fire brigade or an officer in charge of the fire brigade;
 - (b) must outside a fire district, be carried out by or under the supervision of the rural fire brigade specified in the notice or an appropriate officer of the rural fire brigade or any hazard management officer.
- (7) *A notice requiring the establishment of a firebreak cannot require an occupier or owner to kill or remove any trees that are reasonably necessary for shade, shelter, windbreak or fodder purposes or the protection of threatened species, populations, ecological communities or critical habitats within the meaning of the 'Threatened Species Conservation Act 1995.*
- (8) An occupier or owner to whom a bushfire hazard reduction notice is given must, despite the fact that a fire permit has not been granted under Division 5, comply with the requirements specified in the notice.

Section 70(2) states that *'if within the time specified in the relevant notice the owner or occupier to whom it is given fails to comply with any requirement of the notice, the Commissioner may, without prejudice to liability of the owner or occupier, enter on the land and carry out the bushfire hazard reduction work the owner or occupier was required to do under the notice'*.

Section 70(3) states that *'any costs incurred by the Commissioner in carrying out such work may be recovered from the owner or occupier of the land as a debt due to the Crown in a court of competent jurisdiction'*.

3.6 Bushfire Hazard Management within the Development Site.

The management of the landscaped gardens and the vegetation within the development site will remain the responsibility of the property owner.

A Positive Covenant, created under the provisions of the *Conveyancing Act of 1919*, shall be placed on the title of the land to ensure compliance with the management prescriptions for the Defendable Spaces detailed in this report [Refer to Section 5.2].

The management of the road verges that form part of a defendable space will remain the responsibility of Penrith City Council.

SECTION 4

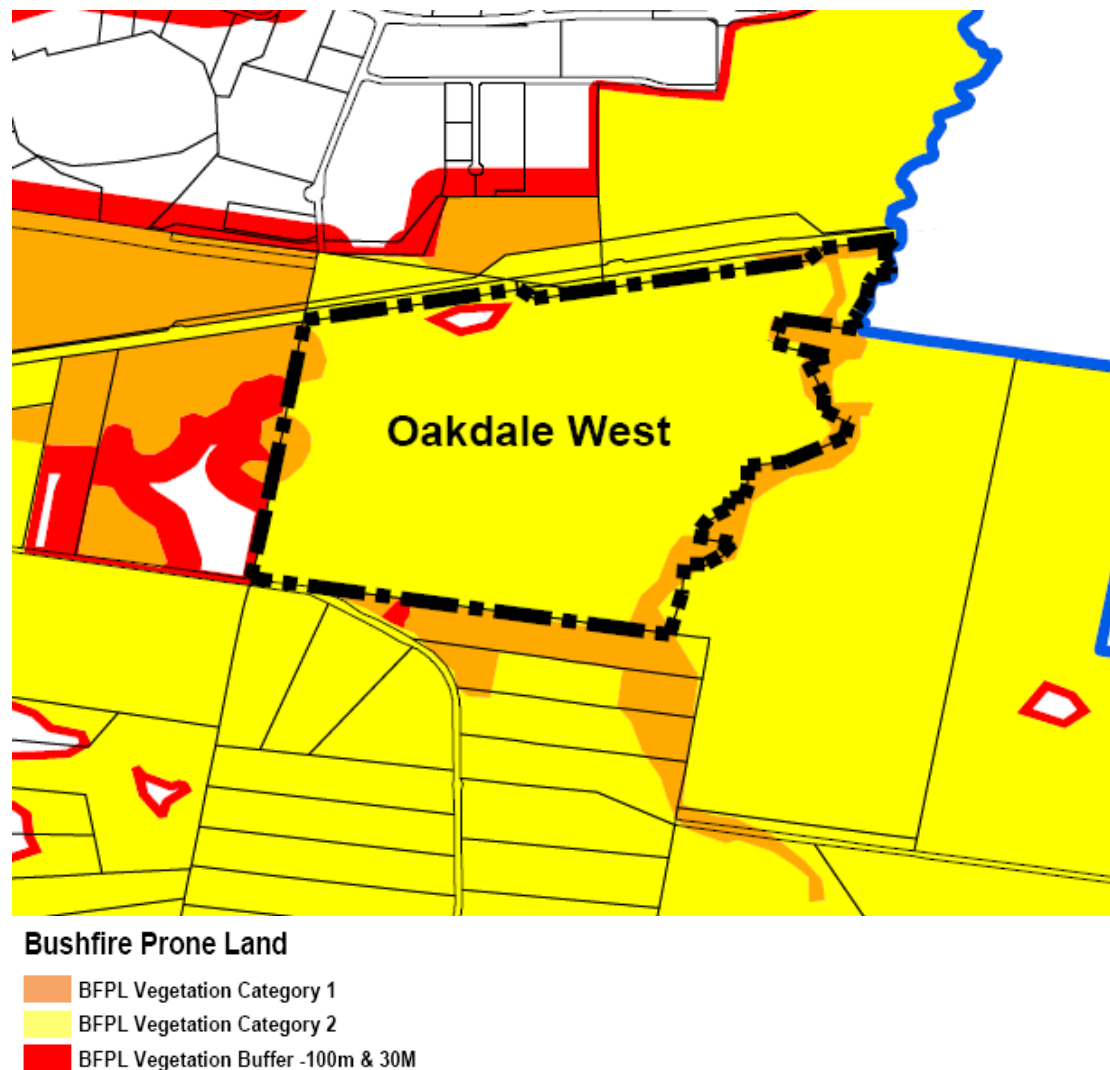
PRECINCT LEVEL ASSESSMENT

4.1 Certified Bushfire Prone Land Map.

Section 146 of the *Environmental Planning & Assessment Act 1979* requires councils, where a Bushfire Risk Management Plan applies, to prepare a Bushfire Prone Land Map in consultation with the Commissioner of the NSW Rural Fire Service.

The Commissioner will designate lands to be Bushfire Prone within an area and, when satisfied that the lands have been recorded on a map, will certify the map as a Bushfire Prone Land Map for the purposes of this or any other Act. Figure 11 below provides an extract from the Penrith Bushfire Prone Land Map.

Figure 11 – Extract from the Penrith Bushfire Prone Land Map



The Penrith Bushfire Prone Land Map shows that the site is impacted by Category 1 Bushfire Prone Vegetation generally occupying the riparian zone to Ropes Creek, the vegetation within the rural residential development to the south and within the College and Retirement Village complex to the west.

The natural revegetation of the Ropes Creek E2 zoned corridor will introduce additional forest vegetation which will become, over the life of the development, bushfire prone.

The Ropes Creek corridor will be increased in width as part of the E2 Environmental Protection Zone and will contain bushfire prone vegetation to a width of approximately 240 – 300 metres wide.

The remainder of the site and adjoining land to the north, east and south is recorded as containing Category 2 Bushfire Prone Vegetation.

The site inspection confirmed the potential fire hazard recorded on the Penrith Bushfire Prone Land Map.

SECTION 5

BUSHFIRE PROTECTION ASSESSMENT

5.1 Introduction.

Chapter 1 of *Planning for Bushfire Protection 2006* states that the aim of the document is to use the NSW development assessment system to provide for protection of human life [including firefighters] and to minimize impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and protection of the environment.

The objectives of the document are:

- Afford occupants of any building adequate protection from exposure to the impacts of a bushfire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- Ensure that safe operational access/egress for emergency service personnel and occupants relocating is provided and/or available;
- Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads within the Asset Protection Zone/s; and
- Ensure that utility services are adequate to meet the needs of firefighters [and others assisting in bushfire fighting operations].

In reference to the construction of the proposed Oakdale Industrial Estate - South the future warehouse buildings are classified as Class 7 buildings as defined by the Building Code of Australia [BCA].

Chapter 1, Section 1.3 of *Planning for Bushfire Protection 2006* states that the construction of Class 5 – 10 buildings on bushfire prone land, or land impacted by bushfire prone vegetation, must meet the aim and objectives of the document.

Chapter 4, Section 4.3.6(f) discusses the bushfire protection to buildings of Class 5 to 8 and 10b of the Building Code of Australia and states:

“The Building Code of Australia does not provide for any bushfire specific performance requirements and as such AS 3959 -1999 does not apply as a set of “deemed-to-satisfy” provisions.

The general fire safety construction provisions [of the BCA] are taken as acceptable solutions, but the aim and objectives of Planning for Bushfire Protection 2006 apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management”.

“Where the aim and objectives of PfPFP [Section 1.1] are not met, then the construction requirements for bushfire protection will need to be considered on a case-by-case basis”.

“In many cases, these types of developments will require on-site parking and loading areas. In such cases, it is prudent to place these facilities in the most appropriate location in order to establish defensible space for fire-fighting purpose”.

The objectives of *Planning for Bushfire Protection 2006* are:

- (i) Afford occupants of any building adequate protection from exposure to a bushfire;
- (ii) Provide for a defensible space to be located around buildings;
- (iii) Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- (iv) Ensure that safe operational access and egress for emergency service personnel and residents is available;
- (v) Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the asset protection zones;
and
- (vi) Ensure that utility services are adequate to meet the needs of fire-fighters and others assisting in bushfire fighting.

The document identifies six core bushfire protection requirements. These are:

- Provision of Asset Protection Zones / Defensible Spaces in accordance with the specific landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Access for fire fighting operations;
- Water Supplies for fire fighting operations;

- Construction standards of buildings located within 100 metres of the bushfire hazard interface, dependant on specification landuse, the predominant bushfire prone vegetation type within 140 metres of the development and the topography of the land containing the bushfire prone vegetation;
- Emergency Planning;
- Landscape Management – in particular the management of the Asset Protection Zones / Defendable Spaces and residual bushfire prone vegetation.

Planning for Bushfire Protection 2006 provides a methodology to determine the Asset Protection Zones [defendable space] and Bushfire Attack [Construction Standards] required for **habitable buildings** in development for **residential purposes** that are designated as bushfire prone.

The document does not provide deemed to satisfy solutions for Class 5 – 8 buildings constructed in bushfire prone areas but states that where the aim and objectives of the document are not met, then the construction requirements for bushfire protection will need to be considered on a case by case basis.

The document also recommends that Class 5 – 8 and Class 10 buildings should be located to provide a defendable space setback which prevents flame contact with the structure.

Section 5.2 of this report examines the Oakdale West layout in relation to the provision of a suitable “defendable space” between the bushfire hazard and the industrial buildings and the protection against the potential impacts of a future fire occurrence in the bushfire prone vegetation on the E2 zoned land/riparian corridor to Ropes Creek to the east, the rural residential land to the south/southwest and within the vegetation on the land to the west and northwest of the development site.

The hazard to the northern aspect of Buildings 1A, 1C and 2A, 2C is mitigated by the existing management regime within the Sydney Catchment Authorities pipeline easement. Similarly, the hazard to the east Buildings 1A, 1B, 4D, 4E, 4F and Building 4G is mitigated by the management of the Ausgrid Power Line Easement that separates these buildings from the bushfire prone vegetation in the Ropes Creek corridor.

The bushfire construction standards to the buildings is examined in Section 5.3 and the provision of access and water supplies for fire-fighting operations’ management of the defendable space [Asset Protection Zone] and evacuation planning are examined in Sections 5.4 – 5.9 of this report.

5.2 The provision of Defendable Space/s [Asset Protection Zones].

Table 1 examines the width of defendable space requirements to the buildings located adjacent to the western boundary [Buildings 2C, 2D, 2E, 2F, 2G and Building 3B] which are exposed to the hazard in the 40 metre wide vegetated corridor, adjacent to the western, which connects to and extends across the adjoining land to the west of the north-western corner of the development site.

Table 2 examines the defendable space requirements to the south of Buildings 4A & 4E and to Building 5A.

Table 1. Determination of Defendable Space to the west of Building 2C, 2D, 2E, 2F, & 2G and Building 3B.

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land	Flame Zone Width – Table 2.4.1 A.S. 3959 - 2009	Width of Defendable Space provided to fixed assets
West of Building 2C & 2D	Cumberland Plain Woodland	Woodland	0 – 5 degrees down slope	15 metres flame length for woodland vegetation on < 5 degrees downslope	Minimum 7.5 metres to the western aspect of Building 2C & 2D.
West of Building 2E, 2F & 2G	40 metre wide corridor of Cumberland Plain Woodland	Woodland reclassified to low hazard 'rainforest'	0 – 5 degrees down slope	10 metres flame length for rainforest vegetation on < 5 degrees downslope	Minimum 7.5 metres to Building 2E & 2F; Minimum 12 metres to building 2G.
West of Building 3B	Cumberland Plain Woodland & managed detention pond	Woodland	< 5 degrees down slope	15 metres flame length for woodland vegetation on < 5 degrees downslope	Minimum 50 metres to the building provided by width of road & building setback

Review of Defendable Space Provisions to Buildings 2C, 2D, 2E, 2F & 2G and Building 3B:

The assessment provided in Table 1 identifies the widths of Defendable Space setbacks required from unmanaged vegetation to the west of Buildings 2C, 2D, 2E, 2F & 2G and Building 3B in order to minimise flame contact and also identifies the available setbacks to the proposed buildings.

Table 1 identifies that the setback to Building 2C; 2D, 2E & 2F does not comply with the flame zone width and these buildings will be located in the flame zone level of construction.

Table 2. Determination of Defendable Space to the south of Building 4A & 4E and to Building 5A.

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class [Table A2.1 Planning for Bushfire Protection 2006]	Effective Slope of Land	Flame Zone Width – Table 2.4.1 A.S. 3959 - 2009	Width of Defendable Space provided to fixed assets
South of Building 4A & 4E	Swamp Oak Forest	Forest	Level	19 metres flame length for forest vegetation on level land	Minimum 23.5 metres to the southern aspect of Building 4A & 4E [7.5m setback from lot boundary + 16m drainage swale].
North of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	0 – 5 degrees down slope	24 metres flame length for forest vegetation on < 5 degrees downslope	Minimum 7.5 metre setback to Building 5A
East of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	< 5 degrees down Slope	24 metres flame length for forest vegetation on < 5 degrees downslope	Minimum 7.5 metre setback to Building 5A
South east of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	< 5 degrees down Slope	24 metres flame length for forest vegetation on < 5 degrees downslope	Minimum 7.5 metre setback to Building 5A

Review of Defendable Space Provisions to Buildings 4A & 4E and to Building 5A:

The assessment provided in Table 2 identifies the widths of Defendable Space setbacks required from unmanaged vegetation to the south of Buildings 4A & 4E and to the north, east and southeast of Building 5A in order to minimise flame contact and also identifies the available setbacks to the proposed buildings.

Table 2 identifies that the setbacks to Building 5A do not comply with the flame zone width and this building will be located in the flame zone level of construction.

5.3 Construction Measures to Buildings.

Tables 1 & 2 identify the separation distance [Defendable Space width] to the proposed buildings exposed to the bushfire hazard. Table 3 examines the bushfire construction standards required to be implemented to comply with A.S. 3959 – 2009 – ‘Construction of Buildings in Bushfire Prone Areas’.

Table 3. Determination of Bushfire Construction Standards to Buildings 2C, 2D, 2E, 2F, & 2G; Building 3B; Buildings 4A & 4E and Building 5A.

Aspect	Vegetation within 140m of development	Predominant Vegetation Formation Class 2010 Addendum Planning for Bushfire Protection 2006]	Effective Slope of Land	Width of Defendable Space provided to fixed assets	Bushfire Construction Standard – A.S. 3959 - 2009
West of Building 2C & 2D	Cumberland Plain Woodland	Woodland	0 – 5 degrees down slope	Minimum 7.5 metres to the western aspect of Building 2C & 2D.	BAL FZ exposed elevations; BAL 40 non-exposed elevations
West of Building 2E, 2F & 2G	40 metre wide corridor of Cumberland Plain Woodland	Woodland reclassified to low hazard ‘rainforest’	0 – 5 degrees down slope	Minimum 7.5 metres to Building 2E & 2F; Minimum 12 metres to building 2G.	BAL FZ exposed elevations; BAL 40 non-exposed elevations
West of Building 3B	Cumberland Plain Woodland & managed detention pond	Woodland	< 5 degrees down Slope	Minimum 50 metres to the building provided by width of road & building setback	BAL 12.5 to building
South of Building 4A & 4E	Swamp Oak Forest	Forest	Level	Minimum 23.5 metres to the southern aspect of Building 4A & 4E.	BAL 40 exposed elevations; BAL 29 non-exposed elevations
North of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	0 – 5 degrees down slope	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations
East of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	< 5 degrees down slope	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations
South east of Building 5A	Swamp Oak Forest in Ropes Creek riparian corridor	Forest	< 5 degrees down slope	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations

Table 3 identifies that Building 2C, 2D, 2E, 2F & 2G and Building 5A will be subject to flame contact. The type of construction of the warehouse buildings can accommodate this level of radiant heat/flame exposure with the use of non-combustible concrete wall systems.

The bushfire construction standards shall apply to the buildings exposed to the bushfire hazard to the level as specified in Table 3 with the following additional measures implemented:

- The downpipe/stormwater system to the internal box gutters shall be sized to provide a self flushing of combustible materials from the roof/gutter. This shall include increased fall in the box gutters to the sumps;
- Any operable windows shall be fitted with aluminium/stainless steel mesh flyscreens having a maximum mesh aperture size of 2mm;
- Access doors [PA and Vehicle] to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be given to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;
- External timber doors shall be fitted with a stainless steel/Colorbond kick plate of 400mm high on the outside of the door;
- External glazed doors and windows shall comply with the requirements for glazing less than 400mm above finished ground level; paths/pavement and elevated roofs;
- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.
- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.

Should the available Defendable Space widths increase from the widths listed in Table 3, reassessment of the construction standards shall be undertaken.

5.4 Access Standards for Firefighting Operations.

Chapter 4, Section 4.2 “Access” of *Planning for Bushfire Protection 2006* provides specifications on the access provisions for fire-fighting operations within developments which are subject to bushfire attack.

Vehicular access to the proposed Oakdale West Estate will be provided with the construction of the Western North South Link Road.

This road and the proposed internal access roads will be constructed to provide heavy rigid and articulated vehicle access to each of the proposed buildings. This internal road network provides suitable access for fire-fighting appliances similar to NSW Rural Fire Service Category 1 Tankers and Fire & Rescue NSW Composite and Aerial Appliances.

The Oakdale West Estate Masterplan identifies access to the bushfire prone vegetation within the Ropes Creek corridor; the vegetation in the corridor along the western boundary and the vegetation on the land to the south is provided either by a perimeter road or by vehicular access to the future buildings or parking areas incorporated into the defensible space setback.

Fire trail access is also provided within the Ausgrid Power Line Easement to assist in fire-fighting and fire prevention operations.

5.5 Water Supplies for Firefighting Operations.

A reticulated water supply for potable water supply and fire hydrants is to be extended into the site.

To Building 2C, 2D, 2E, 2F & 2G; Building 4A & 4E and Building 5A there shall be provided a ring-main to the hazard side of the building, complete with Millcock Valves fitted with Stortz Coupling and Blanking Cap.

The fire-fighting water supply to the new buildings shall comply with the Building Code of Australia [BCA] and A.S. 2419.1 – 2005.

5.6 Emergency Management for Fire Protection / Evacuation.

The new buildings located adjacent to the bushfire hazard may be subject to a fire event that may necessitate evacuation of the buildings. Therefore, it is recommended that the evacuation planning process for these buildings shall also include protocols for bushfire emergencies.

Due to the low bushfire risk to the remaining facilities, not exposed to the bushfire hazard, there is no requirement for the preparation of a specific Bushfire Evacuation Plan or a Bushfire Management Plan for these buildings.

5.7 Bushfire Hazard Management.

The intention of bushfire hazard management is to prevent flame contact with a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimize the potential for wind driven embers to cause ignition and to reduce the effects of smoke on occupants and fire-fighters.

The management of the Defendable Spaces and the sites generally shall comply with the recommendations of Appendix A5.4 & Appendix A5.5 of *Planning for Bushfire Protection 2006* and *Standards for Asset Protection Zones*.

Management of the Defendable Spaces within the development shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the buildings; Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to building;
- Keep areas under shrubs and trees raked and clear of combustible fuels;
- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps].

SECTION 6

BUSHFIRE MANAGEMENT STRATEGIES

Strategies to mitigate the potential bushfire risk to the future buildings within the proposed Oakdale West Estate [OWE] - are as follows:

6.1 Strategy 1 – Defendable Space management Requirements:

Management of the defendable spaces/landscaped areas within the development site shall comply with the following:

- Maintain a clear area of low cut lawn or pavement adjacent to the building;
- Keep areas under shrubs and trees raked and clear of combustible fuels;
- Utilise non-flammable materials such as Scoria, pebbles and recycled crushed bricks as ground cover to landscaped gardens in close proximity to building;
- Trees and shrubs should be maintained in such a manner that tree canopies are separated by 2 metres and understorey vegetation is not continuous [retained as clumps].

6.2 Strategy 2 – Water Supplies/Utilities for Firefighting Operations:

The fire-fighting water supply to the proposed buildings shall comply with the Building Code of Australia [BCA] and Australian Standard A.S. 2419.1 – 2005.

To buildings erected on Lots 3A, 3C, 6A & 6B there shall be provided a ring-main to the hazard side of the building, complete with Millcock Valves fitted with Stortz Coupling and Blanking Cap.

Electricity and gas supplies will be laid underground and therefore address the performance standard of Chapter 4 of *Planning for Bushfire Protection 2006*.

6.3 Strategy 3 – Construction Standards to the buildings located adjacent to the bushfire hazard:

Table 4 identifies the bushfire construction standards required to be implemented to comply with A.S. 3959 – 2009 – '*Construction of Buildings in Bushfire Prone Areas*'.

Table 4. Determination of Bushfire Construction Standards to Buildings 2C, 2D, 2E, 2F & 2G; Building 4A & 4G and Building 5A.

Aspect	Width of Defendable Space provided to fixed assets	Bushfire Construction Standard – A.S. 3959 – 2009
<i>West of Building 2C & 2D</i>	Minimum 7.5 metres to the western aspect of Building 2C & 2D.	BAL FZ exposed elevations; BAL 40 non-exposed elevations
<i>West of Building 2E, 2F & 2G</i>	Minimum 7.5 metres to Building 2E & 2F; Minimum 12 metres to building 2G.	BAL FZ exposed elevations; BAL 40 non-exposed elevations
<i>West of Building 3B</i>	Minimum 50 metres to the building provided by width of road & building setback	BAL 12.5 to building
<i>South of Building 4A & 4E</i>	Minimum 23.5 metres to the southern aspect of Building 4A & 4E.	BAL 40 exposed elevations; BAL 29 non-exposed elevations
<i>North of Building 5A</i>	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations
<i>East of Building 5A</i>	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations
<i>South east of Building 5A</i>	Minimum 7.5 metre setback to Building 5A	BAL FZ exposed elevations; BAL 40 non-exposed elevations

The bushfire construction standards shall apply to the buildings exposed to the bushfire hazard to the level as specified in Table 4 with the following additional measures implemented:

- The downpipe/stormwater system to the internal box gutters shall be sized to provide a self flushing of combustible materials from the roof/gutter. This shall include increased fall in the box gutters to the sumps;
- Any operable windows shall be fitted with aluminium/stainless steel mesh flyscreens having a maximum mesh aperture size of 2mm;
- Access doors [PA and Vehicle] to the buildings shall be fitted with seals that seal the bottom, stiles and head of the door against the opening/frame to prevent the entry of embers into the building. Particular attention shall be given to the gap at the head of the curtain of the roller doors, where mohair type seals can be used;

- External timber doors shall be fitted with a stainless steel/Colorbond kick plate of 400mm high on the outside of the door;
- External glazed doors and windows shall comply with the requirements for glazing less than 400mm above finished ground level; paths / pavement and elevated roofs;
- Any external vents, grilles and ventilation louvres shall have stainless steel mesh with a maximum aperture of 2mm square fitted to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.
- Roof ventilators shall be fitted with stainless steel flymesh [2mm aperture] to prevent the entry of embers into the building or be fitted with a louvre system which can be closed in order to maintain a maximum aperture or gap of no more than 2mm.

Should the available Defendable Space widths increase from the widths listed in Table 4, reassessment of the construction standards shall be undertaken.

6.4 Strategy 4 – Emergency Management for Fire Protection / Evacuation.

The evacuation planning process for the buildings located adjacent to the bushfire hazard shall also include protocols for bushfire emergencies.

6.5 Strategy 5 – Access Standards for Firefighting Operations.

Access to the bushfire prone vegetation shall be provided either by a perimeter road or by vehicular access to the future buildings or parking areas that are incorporated into the defendable space setbacks.

The access provisions shall satisfy the NSW Rural Fire Service and Fire & Rescue NSW appliance requirements.

SECTION 7

CONCLUSION

A State Significant Development Application [SSDA] is being lodged by Goodman Property Services (Aust) Pty Ltd for the subdivision of the IN1 zoned land within the Oakdale West Estate on Lot 11 in DP 1178389 and the construction of Buildings 1A, 1B & 1C in Precinct 1 of the Estate. The proposed industrial subdivision creates a total of twenty two [22] lots and the construction and dedication of public roads.

The SEARS [Secretary's Environmental Assessments Requirements] for Oakdale South were issued on the 26th November 2015 and contain a requirement that the EIS for the Master Plan and Stage 1 works must address bushfire – including consideration of bushfire measures as outlined in *Planning for Bushfire Protection 2006*, particularly asset protection zones, access and water utilities.

The Penrith Bushfire Prone Land Map records the development site as containing Category 1 bushfire prone vegetation, located along the Ropes Creek corridor and in pockets adjacent to the western boundary and on the land to the south. The remainder of the development site is recorded as containing Category 2 Bushfire Prone Vegetation.

The Oakdale West Estate Masterplan prepared by SBA Architects identifies the establishment of a 'biodiversity lot' that contains the riparian corridor and the floodplain to Ropes Creek. This lot will contain unmanaged vegetation which will become a bushfire hazard to the proposed industrial development, increasing the area of Category 1 Bushfire Prone Vegetation along the eastern portion of the development site.

The proposed development, not being the subdivision of bushfire prone land for the purpose of rural residential or residential development or for the construction of a '*Special Fire Protection Purpose Development*' is not integrated development as defined by Section 91 of the *Environmental Planning & Assessment Act 1979*.

The subdivision of bushfire prone land for industrial purposes is assessed under the provisions of Section 79BA of the *Environmental Planning & Assessment Act 1979* and requires compliance with the aim and objectives of *Planning for Bushfire Protection 2006*.

This report has examined the objectives of *Planning for Bushfire Protection 2006*, in relation to the provision of bushfire protection measures to the future construction of industrial buildings on the lots created in the subdivision, and has provided recommendations on:

- The provision of a combination of defensible space [separation of the buildings from the bushfire hazard] and the construction standards to the buildings;
- Access and water supply provisions for fire-fighting operations;
- Management of the fire protection measures, including the defensible spaces; and
- Emergency management [evacuation] planning.

Table 5 summarises the extent to which the development conforms to the aim and objectives of *Planning for Bushfire Protection 2006* in order to address the SEARS.

Table 5. Compliance with the aim and objectives of *Planning for Bushfire Protection 2006*.

Bushfire Protection Measure	Compliance with the aim and objectives of <i>Planning for Bushfire Protection 2006</i>.
Defensible Space setbacks/construction standards to future industrial buildings	The combination of a Defensible Space and construction standards to the future industrial buildings located adjacent to the bushfire hazard addresses the requirement that the occupants are afforded adequate protection from exposure to a bushfire and that the buildings will not be exposed to material ignition.
Access for fire-fighting operations	The proposed public access roads comply with the specifications of Section 4.1.3(1) of <i>Planning for Bushfire Protection 2006</i> and provide satisfactory emergency access for fire-fighting appliances. Access for fire-fighting operations to be provided to the perimeter lots adjoining the bushfire hazard [located within the Defensible Space setback]. Positive Covenant to be recorded on title of each lot located adjacent to the bushfire hazard for access for fire-fighting operations.
Water supplies for fire fighting	Hydrant supply to be installed in accordance with AS 2419.1 - 2005 – additional fire-fighting ring main and Millcock Valves to be provided to buildings exposed to the bushfire hazard [Buildings 2C, 2D, 2E, 2F & 2G and Building 4A & 4G and Building 5A.
Management of the fire protection measures, including the defensible spaces	Each lot owner responsible for the maintenance of the recommended fire protection measures and provision of the fire access road. Positive Covenant to be recorded on title of each lot.
Emergency Management	Owners of buildings shall address protocols for the management of staff and site facilities during bushfire occurrences

The characteristics of the site, together with the recommendations contained in this assessment, identify that the site is suitable in terms of its intended use.

I therefore confirm that the proposed development complies with the aim and objectives of *Planning for Bushfire Protection 2006* and the deemed to satisfy requirements of Section 4.3.6(f) of *Planning for Bushfire Protection 2006* – Buildings of Class 5 to 8 and Class 10 of the Building Code of Australia in respect to the provision of asset protection zones [defendable spaces], access and water/utilities as required by the SEARS.



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SECTION 8 – Oakdale West Estate Masterplan showing Defendable Space widths to the future buildings.



REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection 2006*;
- *Environmental Planning & Assessment Act – 1979*;
- *Rural Fires Act – 1997*;
- *Rural Fires Regulation 2013*;
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping 2015*;
- *Bushfire Environmental Assessment Code 2006*;
- Building Code of Australia;
- Australian Standard A.S 3959-2009 “*Construction of Buildings in Bushfire Prone Areas*”;
- *Penrith City Council Bushfire Prone Land Map*.

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